N8 Cashel Bypass & N74 Link Road

Phase 2 Archaeological Investigations

Licence Number:	03E0424
Site Name:	Site 35
Townland:	Windmill / *Baile an Mhuilinn*
Barony:	Middlethird
Parish:	St Patrick's Rock
County:	Tipperary
NGR:	207291 / 139059 (centre of site)
OD Level:	131.23 m - 136.13 m
Excavation Area:	3,328 m²
Fieldwork Date:	March 2003
Site Director:	Neil Fairburn
Report Author:	Richard O'Brien
Client:	South Tipperary County Council
Report Status:	Final Report
Report Date:	April 2013

South Tipperary COUNTY COUNCIL
Comhairle Contae Thiobraid Árann Theas

NRA National Roads Authority
An tÚdarás um Bóithre Náisiúnta

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EXECUTIVE SUMMARY

This report contains the final results of an archaeological excavation carried out as part of the N8 Cashel Bypass & N74 Link Road (03E0424). Pre-construction testing undertaken in 2002 by Mary Henry Archaeological Services Ltd identified an area of archaeological activity in Windmill, Cashel, County Tipperary (02E0378). The testing uncovered a number of features between chainage 1040–1200: two postholes, two pits and a plough furrow concentrated in the centre of the site and a field drain towards the edge of the testing area (Lennon 2002).

Full archaeological excavation was conducted by Judith Carroll Network Archaeology Ltd (JCNA Ltd) as part of Phase 2 archaeological resolution between the 25th and 28th of March 2003 (03E0424).

The earliest dated feature on the site was an Early Neolithic pit [06] found at the south-east corner of the site, close to the southern baulk. As the single fill (05) showed evidence of dumped burning debris it is likely this pit represented a rubbish pit. Oak (*Quercus sp.*) charcoal returned a radiocarbon date of 3763–3638 cal BC (UBA-13798) making the activity associated with this pit the earliest recorded activity on Windmill Hill.

Three features were dated to varying stages of the Early Bronze Age period spanning an 800-year period between c. 2400–1600 BC. Posthole [32] was located beside two undated small charcoal spreads. Oak (*Quercus sp.*) charcoal from the fill was radiocarbon dated to 2469–2299 cal BC (UBA-13797). Pit [04] produced oak (*Quercus sp.*) charcoal radiocarbon dated to 2204–2037 cal BC (UBA-13800). Pit [45] was radiocarbon dated to 2134–1910 cal BC (UBA-13795), contemporaneous with the Site 36i roundhouse c. 50 m to the west. A slightly later feature, pit [16], was located near the south-eastern edge of the site, to the west of pit [04]. Pomaceous (*Pomoideae sp.*) charcoal from the fill was radiocarbon dated to 1893–1691 cal BC (UBA-13801). On nearby Site 34 a burnt pit produced spindle (*Evonymus europaeus*) charcoal from its fill dated to 2129–1941 cal BC (UBA-13788): a sherd of vase food vessel pot was recovered from the same fill. Another pit containing cremated bone was found to be roughly contemporary as oak (*Quercus sp.*) charcoal from its fill was dated to 2013–1828 cal BC (UBA-13786). A flint convex end scraper was recovered from the upper portion of the fill and sherds of Beaker pottery were found in retents from the same fill.

Three features were dated to varying stages of the Middle Bronze Age period spanning a 600-year period between c. 1700–1100 BC. Posthole [54] was an isolated feature located at the northern end of the site and was radiocarbon dated to 1751–1616 cal BC (UBA-13794). On Site 34 c. 50 m to the east an excavated pit produced alder (*Alnus glutinous*) charcoal from its fill dated to 1526–1397 cal BC (UBA-13787). On Site 33 c. 30 m to the east the excavation of a portion of a linear feature produced spindle (*Evonymus europaeus*) charcoal radiocarbon dated to 1425–1313 cal BC (UBA-13784). Two other features on Site 35 slightly later in date were clearly contemporary although they were found c. 30 m apart: pit [38] and posthole [22]. Pit [38] produced 12 small pieces of bone that can be classified as fragments of long bone from a medium-sized animal such as sheep or pig (Appendix 7) and pomaceous (*Pomoideae sp*.) charcoal from the same fill was radiocarbon dated to 1393–1215 cal BC (UBA-13793). These bones are very significant as they represent the earliest faunal remains from Cashel that were not subject to burning. An isolated posthole [22], in the southern portion of the site, was radiocarbon dated to 1370–1126 cal BC (UBA-13796). Combined, the evidence from these sites suggests domestic activity on Windmill Hill right through the Middle Bronze Age period.

A hiatus in human activity ensued on this part of Windmill Hill and a single posthole, [24], was dated to the medieval period cal AD 1217–1376 (UBA-13799). This activity may be related to the nearby Leper Hospital. The discovery of possible human bones (six in total) may also be associated with the Hospital to although they were found *c.* 200 m away. However these bones were lost by JCNA during post-excavation works.

There is a very high probability of archaeological features associated with Site 35 continuing southward and surviving between the N74 road and the Windmill Hilltop Enclosure TS061-072. This area was recently subject to geophysical investigation for research purposes (Gimson 2012, ii). The survey revealed a significant highly magnetic boundary detected to the north of the Windmill Hill Enclosure; this contained a misalignment gap or entrance possibly leading to the enclosure. To the north is a ditched enclosure containing a visible entranceway, again facing the Windmill Hill Enclosure, and a large number of possible pits. It is likely that some of these geophysical anomalies may be associated with the archaeology revealed on Site 35. Therefore any proposed developments within this area should be subject to archaeological investigations prior to any development taking place.

INTRODUCTION

This report contains the final results of an archaeological excavation carried out as part of the N8 Cashel Bypass & N74 Link Road. The scheme involved an 8 km bypass of the town and a 2 km link road to the N74 (Figure 1). South Tipperary County Council completed the bypass and the new roads opened in October 2004. The project was funded by the Irish Government under the National Development Plan, 2000–6. The total archaeological cost was administered by the National Roads Authority through South Tipperary County Council, as part of the Authority's commitment to protecting our cultural heritage.

Project Background

RPS Consultants Ltd carried out a desk-based archaeological survey of the N8 Cashel Bypass and N74 Link Road route in 1995, recommending an eastern bypass of the town so as to avoid direct negative impacts on the Rock of Cashel, a National Monument (Cronin 1995). There was no Environmental Impact Statement (EIS) prepared for the project. RPS Consultants Ltd compiled an archaeological impact assessment of the route in 1999 (Lane 1999). The report identified five sites of cultural significance that would be directly impacted upon by the construction of the N8 Bypass. In addition five sites of archaeological potential were discovered by the Project Archaeologist from the examination of aerial photographs and a walkover survey of the route in April 2001. Between April and May 2002, Phase 1 Pre-Construction Archaeological Testing of these ten cultural heritage sites was undertaken by Mary Henry Archaeological Services, under Excavation Licence Numbers 02E0286, 02E0287, 02E0288, 02E0374, 02E0375, 02E0376, 02E0377, 02E0378, 02E0379 & 02E0380 (Lennon 2002). Those townlands investigated were Gortmakellis, Ballyknock, Monadreela, Boscabell, George's-Land, Windmill and Farranamanagh. Archaeological features discovered during this work formed the basis of the Phase 2 investigations of the bypass in 2003.

In 2003 a joint venture company Judith Network Archaeology Ltd (JCNA) was contracted by South Tipperary County Council to undertake Phase 2 works. This involved further archaeological testing of areas of the bypass previously unavailable, carried out under

Excavation Licence Number 03E0295. Phase 2 works also involved Fixed Price archaeological resolution of a number of sites discovered in the Phase 1 works. Thus both testing and resolution works often occurred within the same field. This work began in April and continued until August 2003, during which the main construction contractor Roadbridge Ltd began on-site works. The bypass officially opened in 2004. Initial post excavation works began in August 2003 but were suspended as JCNA Ltd went into liquidation in January 2004. Over the succeeding years some preliminary reports were issued by the various licence holders on an individual basis, while some specialist works were undertaken. Between 2008–10 the baulk of report writing and specialist analysis was completed under the supervision of the NRA Project Archaeologist. Remaining work since 2011 was undertaken directly by the NRA Project Archaeologist.

Project Description

The N8 Cashel bypass began north east of Cashel town, *c.* 3.5 km from the Rock of Cashel, in the townland of Gortmakellis. The bypass generally kept to the east side of Cashel for most of its length so as to minimise visual impacts on the Rock of Cashel. It continued south through flat, good agricultural land, before rising gradually and cutting through the eastern end of Ballyknock Hill, *c.* 166 m OD, at the western end of the Slieveardagh ridge. The bypass continued south through slightly undulating ground, skirting the eastern side of the Monadreela ridge, *c.* 151 m OD. The lower part of this ridge was low-lying, heavily water-logged ground. The bypass continued southeast through relatively flat land, before terminating 2 km south of Cashel in Owen's and Bigg's-Lot townland. The mainline of the bypass measured *c.* 70–80 m wide.

The N74 Link Road began in Windmill townland *c.* 400 m from the old N8 Cork road end of the bypass, heading west and then northwest for its length. The route skirts close to the hilltop enclosure at Windmill TS061-072, before descending through Windmill along flat, good agricultural land, before cutting through a low ridge in Deerpark townland. The route descended through Farranamanagh townland continuing north toward the N74 Tipperary road. The link road was 2 km in length, and *c.* 60 m wide.

The project was designed to avoid in as much as practical all known archaeological sites located close to the CPO such as Gortmakellis ringfort TS061-003, Gortmakellis tower house TS061-011, Ballyknock ringfort TS061-008, Boscabell moated site TS061-027, Rathordan ringfort TS061-074, Windmill ringfort TS061-072, Windmill Leper Hospital (*site of*) TS061-073, Windmill moated site TS061-167 and Farranamanagh ringfort TS060-084. The investigation of the *Rian Bo Phadriag* roadway (TS061-071) was the only example where the bypass directly impacted a known RMP site and this was unavoidable as the roadway had to be traversed by the bypass.

Excavation Methodology

The investigations began across the entire bypass although lands at Owen's and Bigg's-Lot were unavailable for investigation until July. All sites were investigated by mechanical excavators under constant archaeological supervision. The topsoil was removed down to the natural glacial till, or to the top of archaeological features, depending on what was encountered first. In the main the natural consisted of compacted yellow / orange clay. In areas of water-logged conditions such as at Monadreela, George's-Land and Owen's and Bigg's-Lot the natural changed to grey / white malleable clay. In areas of higher ground in Ballyknock, Windmill and Deerpark bedrock limestone outcropped close to the base of the topsoil. In particular on the northwest-facing slope of Windmill Hill (Sites 31–35) and Windmill/Deerpark ridge the natural contained bedrock outcropping and bands of gravel (Sites 38–39). A cave is shown on the 1st Edition OS Map at the extreme southwest corner of Hughes'-Lot East, near the Corporation Boundary junction with Waller's-Lot.

A total of 56 Excavation Licence Numbers were issued by the Department of Environment, Heritage and Local Government during the course of the bypass archaeological works. This total included the general archaeological testing licence 03E0295 which was used across the scheme, the specific testing of the *Rian Bo Phadriag* roadway (TS061-071) in Owen's and Bigg's-Lot 03E1211, and the archaeological monitoring of bypass outfall drains across various townlands, 03E1087. In most instances the licence issued for specific

archaeological testing of a site was retained for the subsequent resolution of that site, as resolution followed on immediately once archaeology was definitively identified.

The following tables list those sites on the N8 Bypass mainline and N74 Link Road where excavations uncovered definitive archaeological remains (see below). What is clear from these tables is the multi-period nature of many of the sites investigated. Such discoveries have been mirrored on both NRA-funded projects north and south of Cashel, although it is clear the density of sites uncovered around Cashel is exceptional (McQuade 2009, xiii). Although it could be explained that this higher site density was due to Cashel's prominence as an ancient royal capital in the early historic era, the higher numbers of prehistoric sites appears to indicate intense settlement around Cashel from the beginnings of the Early Bronze Age. The good quality farming land, based on brown podzolic soils over limestone bedrock, was a main attraction for settlement. Coupled with this was Cashel's strategic location south of the bog lands around Littleton/Thurles, and north of the Galtee Mountains and River Suir plain. Although Cashel has no river many number of small streams (Arglo, Black, Halfmile & Maddock) fed by a widespread system of ponds served as convenient water sources: it was no coincidence that when excavations occurred beside these ponds i.e. Monadreela, Boscabell and Owen's and Bigg's-Lot, multi-period sites were uncovered.

Windmill townland is located c. 1.7 km south of Cashel town. Windmill Hill contains a hilltop enclosure (RMP No. TS061:072), the site of a medieval Leper Hospital (RMP No. TS061:073) and a moated site (RMP No. TS061-167). On the western side of the hill, in the grounds of Windmill house is ringfort, TS060-108. The RMP lists a possible enclosure, bawn and dwelling in the townland, TS060-087, TS060-08801 and TS060-08802 (Figure 2). However, there is no positive evidence for these sites (see www.archaeology.ie for updated information on these sites).

An extensive archaeological test excavation programme was carried out as part of the pre-construction phase of the project by Anne-Marie Lennon on behalf of Mary Henry Archaeological Services Ltd in 2002. Under excavation licence 02E0378 the N74 Link Road was tested on the north side of Windmill hilltop enclosure, TS061-072, due to its proximity to this recorded monument. The testing area was termed Site 7 and spanned 160 m in length between chainage 1040-1200. This area was contained within one agricultural field used for cattle grazing that slopes down to the north and east. Site 35 was specifically

located between chainage 1160-1225 on the western side of the field. The archaeological features revealed in testing consisted of two postholes, two pits and a plough furrow concentrated in the centre of the site and a field drain (un-numbered) towards the edge of the testing area (Lennon 2002, 02E0378, Site 7, Drawing 1, Fig. 2 & Plates 1-3, Contexts C2, C5, C7, C9 & C11). The testing revealed a number of archaeological features in the same field subsequently divided into sites 31–35 respectively (Fairburn 2006d).

Machine stripping of the topsoil and hand excavation of Site 35 was conducted as part of Phase 2 archaeological resolution in April 2003 by JCNA Ltd, under excavation licence 03E0424, directed by Neil Fairburn (Fairburn 2006h). In any discussion the Windmill Hill excavations undertaken on sites 31–36i should be viewed collectively due to their proximity to each other, and their location on the north side of this prominent hillside (Figures 3, ix & x).

Site No	Licence No.	Townland	Mesolithic	Neolithic	Copper Age	Early Bronze Age	Middle Bronze Age	Late Bronze Age	Iron Age	Early Medieval	Medieval	Post Medieval
			7000–4000 BC	4000–2400 BC	2400–2200 BC	2200–1600 BC	1600–1100 BC	1100–800 BC	800 BC–400 AD	400–1200 AD	1200–1500 AD	1500–1900 AD
1i	03E0673	Ballyknock										
1ii	03E0740	Ballyknock										
1iii	03E0727	Clonmore										
5	03E0299	Monadreela										
7	03E0300	Monadreela										
8	03E0379	Monadreela										
9	03E0345	Monadreela										
10	03E0300	Monadreela										
11	03E0346	Monadreela										
12	03E0393	Monadreela										
13	03E0378	Monadreela										
14	03E0395	Monadreela										
15	03E0394	Monadreela										
16	03E0427	Boscabell										
17	03E0413	Boscabell										
18	03E0425	Boscabell										
19	03E0426	Boscabell										

20	03E0470	Boscabell										
21	03E0480	Boscabell										
22	03E0503	George's-Land										
23	03E0508	George's-Land										
24	03E0507	George's-Land										
25i	03E0731	Kilscobin & Hughes'-Lot East										
25ii	03E0730	Kilscobin & Hughes'-Lot East										
25iii	03E0746	Hughes'-Lot East										
25iv	03E0807	Hughes'-Lot East										
25v	03E0756	Rathordan										
27	03E0289	Waller's-Lot & Rathordan										
29	03E0287	Waller's-Lot										
30i	03E0754	Cooper's-Lot										
30ii	03E0762	Cooper's-Lot										
30iii	03E1086	Owen's and										

		Bigg's-Lot										
42	03E0582	Gortmakellis										
TI061:071	03E1211	Owen's and Bigg's-Lot										

Table i: Excavations undertaken on the N8 Cashel Bypass mainline

Site No	**Licence No.**	**Townland**	**Mesolithic** **7000–4000 BC**	**Neolithic** **4000–2400 BC**	**Copper Age** **2400–2200 BC**	**Early Bronze Age** **2200–1600 BC**	**Middle Bronze Age** **1600–1100 BC**	**Late Bronze Age** **1100–800 BC**	**Iron Age** **800 BC–400 AD**	**Early Medieval** **400–1200 AD**	**Medieval** **1200–1500 AD**	**Post Medieval** **1500–1900 AD**
31	03E0391	Windmill										
32	03E0399	Windmill										
33	03E0398	Windmill										
34	03E0418	Windmill										
35	03E0424	Windmill										
36i	03E0675	Windmill										
36ii	03E0676	Windmill										
37	03E0419	Windmill										
38	03E0760	Windmill, Deerpark &										

		Farranamanagh										
39	03E0757	Farranamanagh										
40	03E0502	Farranamanagh										
41	03E0674	Farranamanagh										

Table ii: Excavations undertaken on the N74 Link Road

Table ii illustrates the very prominent geophraphical attraction of the upland areas of Windmill Hill and Windmill / Deerpark, being the focus of settlement and ritual activity throughout prehistory. For Windmill Hill itself (Sites 31–36i) there is an apparent hiatus in activity between the Late Bronze Age and Medieval periods, centred round the hilltop enclosure (TI061-072): it is likely the enclosure itself was occupied during this time with the surrounding fields perhaps used for agriculture rather than settlement.

Table iii lists those sites where licenes were issued and investigations proved to be non-archaeological:

Site No.	Licence No.	Methodology	Townland
1iii	03E0727	Resolution	Clonmore
2	03E0297	Testing	Ballyknock
3	03E0296	Testing	Ballyknock
4	03E0298	Resolution	Monadreela
6	03E0349	Testing	Monadreela
25vi	03E0747	Resolution	Rathordan
25a	03E0294	Resolution	Waller's-Lot
26	03E0347	Resolution	Rathordan
28	03E0292	Resolution	Waller's-Lot
43	03E1087	Monitoring	various
1, 1a, 25, 30, 36, 38	03E0295	Testing	various

Table iii: Excavations which produced non-archaeological sites

No further works were undertaken on these sites.

As the bypass was a design-and-build-type project design changes were made during the construction period in 2003. Such changes only involved works within the Compulsory Purchase Order lands (CPO), and were subject to the prior approval of South Tipperary County Council. These changes meant that some areas which had been archaeologically tested were not impacted further and therefore archaeological remains were preserved *in situ*. Such areas have been identified in each relevant final report and notified to the Archaeological Survey of Ireland:

Site	Licence	Townland	NGR	Description
Site 22	03E0503	George's-Land	209522 / 141100	ploughed-out *fulacht fia* dated to the Early Bronze Age
Site 24	03E0507	George's-Land	209520 / 140985	undated pits & ditches
Site 25ii	03E0730	Hughes'-Lot East	209380 / 140607	western portion of an Early Medieval ringfort
Site 25iv	03E0807	Hughes'-Lot East	209317 / 140363	eastern portion of an Early Medieval ringfort
Site 25v	03E0756	Rathordan	209140 / 140070	pits & ditches, one date from the Late Bronze Age

Table iv: Excavations where portions of the archaeology was preserved *in situ* within the CPO

Local Information

The route of the bypass traversed a number of upstanding townland boundaries generally consisting of high clay and/or stone banks topped with hedging, occasionally with a ditch either on one side or both. In some cases these ditches were active streams (Boscabell / George's-Land boundary; George's-Land / Hughes'-Lot East boundary). The townlands of Gortmakellis, Ballyknock, Monadreela, Boscabell, George's-Land, Kilscobin and Rathordan were located within St. Patricks Rock parish. At the George's-Land / Hughes'-Lot East boundary (Site 25i) the route entered St. John Baptist parish, formerly the Cashel Corporation Municipal Boundary too, and included the townlands of Hughes'-Lot East, Waller's-Lot, Cooper's-Lot and Owen's and Bigg's-Lot. On the link road Windmill was located within Part of St. Patricks Rock parish. At the junction of Windmill / Deerpark (Site 38) the route entered Farranamanagh in the parish of Hore Abbey. The profiles of townland boundaries were recorded during excavation and incorporated into the relevant final report. Changes to these boundaries over time can be traced in the Historical Background section below.

There are many interesting placenames around Cashel recorded cartographically and / or in historical sources, such as *Poulmawkeorish* in Castlelake; *Poulagower* in Attykit; *Foresdin* in Hill's-Lot; *Carrigeenedeen* and *Fawnsuir* in Carron; *Parknapeast*, *Turreen Spring* and *Mullenavivva Pool* in Ballinamona; *Knockananulla* in Hore Abbey; *Granias Well* in Deerpark; *Loughroentaggart*, *Lough Nahinch* and *Doon Fort* in Farranamanagh; *Ogaunoch and Coun* [Rathcoun?] *and the hill of Tubbiradoon…a well called Tubbiradoon near Doon Fort* (Davis White 1866, 47); *Goul's Pool* in Waller's-Lot; *Corralough Well* in Corralough; *Gallows Hill* in Hughes'-Lot East; *the Fahy and the common lands of the town alias Cottyne* (Fiants 1994, 485); '*Brockroghtie and a meadow near Gallows hill called Monyarnycrohy*' (IMC 1966, 281).

GEOLOGY & SOILS

The Cashel environs are situated on the eastern edge of the Golden Vale, and the southern edge of the central limestone plains of Ireland. The landscape has been formed by glacial meltwater and morainic deposition. The bypass route traversed the low-lying, fertile, well-drained and easily worked soils with underlying calcareous tills, which sweep away from the Knockmealdown and Galtee Mountains and Slievenamon to the south.

Ballyknock, in the north of the main route, and Windmill, in the southern part of the link road, are high prominent landmarks. The undulating land is made up of gently sloping rounded ridges oriented east/west. The streams create a cross-drainage system running between the ridges and along the bottom of the slopes, eventually flowing to the west, towards the River Suir drainage basin. The rock type of the area is composed of limestones from the Carboniferous period. On the west and southwest are the Hore Abbey Limestone and Lagganstown formations. To the southeast is the Ballyadams formation, with the Killeshin Siltstone and Clogrenan formations to the northeast and north respectively. The Hore Abbey formation consists of pale grey bedded limestone with chert, with the Lagganstown formation made up of dark thin cherty limestone. The Ballyadams formation is a Burren-type limestone with thick ledges. The Clogrenan formation is bluish-grey limestone with irregular nodules of black or blue chert, wackestones and packstone limestones. The Killeshin Siltstone formation is composed of muddy siltstone and silky mudstone (Archer, Sleeman & Smith 1996).

Geological features such as swallow holes are recorded in Cooper's-Lot and Owen's and Bigg's-Lot. There is a cave marked on the 1st Edition OS six-inch map at the southwestern edge of Hughes'-Lot East near its junction with Waller's-Lot: the site is not recorded on later mapping. Locations of stepping stones and fords are first recorded on the 2nd Edition OS six-inch map in Hughes'-Lot East, possibly associated with the Cashel Reservoir on the Dualla Road. On the same map disused limekilns are shown in many townlands such as Farranamanagh, Rathcoun, Rathordan, Spafield and Windmill. The dominant soil type is the grey brown podzolic which are fertile, well-drained soils ranging in depth from 0.20–0.60 m. It is an excellent soil type for agriculture, in particular horse breeding, for which this area of south Tipperary is renowned for.

ARCHAEOLOGY OF THE CASHEL AREA

Prior to the bypass archaeological excavations little was recorded of Cashel's prehistory, with a few uncontexted finds from around Cashel including a stone axe head, and various artefacts of bronze (axes, javelins / spearheads) and curiously, 262 bronze rings (see Appendix i). No prehistoric settlement sites were recorded – a situation that was to change with the bypass investigations. To the east of Cashel a Bronze Age burial had been discovered in Fussough townland, Dualla in 1933: a stone-lined cist burial containing an urn and human bones was dug up from a sandpit at the western base of the Kill Hills TS053-096 (O'Brien 2007, 93–4; Waddell 1990, 134).

The prehistory of Cashel has emerged slowly from beneath the citadel of the Rock of Cashel, whose mix of ecclesiastical and secular architecture generally dominates all discussion and research. The discovery from the middle of the 19th century onwards of metal artefacts from around Cashel, mainly bronzes such as axes, hinted at prehistoric activity in the area (Shearman 1852, 203). The recovery of artefacts from the Rock of Cashel summit is recorded from as early as 1849, with a bronze bell being found (Wyse Jackson 1956, 18). Perhaps the first archaeological excavation in Cashel occurred in the 1850's with investigations inside the Round Tower on the Rock (Fitzgerald 1857, 292). This may have been spurred by the establishment of the Cashel Chapter House Museum on John Street by Mr. Newport B. White in 1855. Two publications by his brother Rev. John Davis White listed a range of objects housed in the Museum, many of which were described as being found from around Cashel (Woodworth 1989, 149).

John Davis White included amongst the museum collection a large helmet [and human bones] found in Farranavarra, northeast of Cashel, possibly associated with the 1170's battle between the Irish and Anglo-Normans (Davis White 1892, 12). In his history of Ireland Giraldus Cambrensis described earthworks being thrown up near Cashel during a battle between the Anglo-Normans and Irish – *As [Raymond le Gros] was advancing towards Cashel…he heard that the men of Thomand had…come to block his path in the pass of Cashel. By laying down broken branches of trees and digging trenches they had greatly broken up a terrain already naturally difficult, and had also built a very strong palisade right across the path…the stockade was completely broken down and destroyed, not without great loss of life among the defenders, and they opened up a path with their swords, and then enlarged it* (Scott and Martin 1978, 161–3). The location of this ancient pass of Cashel is still unknown. Davis White also reported on the discovery of human skulls and bones in Doon Fort, Farranamanagh, possibly associated with the Desmond Rebellion of 1581 (Davis White 1866, 46–7).

Following in the footsteps of Davis White a later cleric, Rev. Robert Wyse Jackson began recording antiquities around Cashel's hinterland in the 1950's, and some of the objects he discovered are listed in Appendix i (Wyse Jackson 1956a, 21). Cashel's Anglo-Norman moated sites were included in Barry's seminal study of this monument type in the 1970's, including the Boscabell moated site TS061-027 (Barry 1977). These and the other rural sites around Cashel were visited and listed as part of Reynolds's 1975 survey of Tipperary South Riding, followed by Cahill's 1982 study of the barony of Middlethird, as part of an unpublished Master's thesis for UCC. Local historians such as A. Finn, P. J. Davern, J. Knightly, M. 'Bob' O'Dwyer and E. Dalton have over the years lectured and occasionally published about Cashel (see Moloney 1994).

Prior to the bypass excavations in 2003 no discoveries of Mesolithic sites had been made in the Cashel area – the nearest such activity was represented by the uncontexted flints found at Ballybrado House, near Cahir (Woodman & Finlay 2001, 189); a Mesolithic date from the Bronze Age site of Curraghatoor, Co. Tipperary is considered unreliable (Cleary 2007, 39); a single Mesolithic macro flint was found in a medieval context in Toureen Peakaun near Cahir (Ó Carragáin 2011, 341–2) while a possible Mesolithic object, a single retouched jasper point from Chancellorsland, Co. Tipperary is paralleled with objects from the later Mesolithic site at Ferriter's Cove, Co. Kerry (Doody 2008, 329).

Cashel did not feature as a place of recorded Neolithic activity with no megalithic monuments nor house sites known. Only three flints were retrieved from the Rock of Cashel excavations in the 1990's – no further details are known at present (www.homepage.eircom.net/~dunamase/Dunamase.html) There are a number of undated megalithic structures around Clonoulty and Hollyford northwest of Cashel, recorded by the Archaeological Survey of Ireland. The nearest megalithic tomb is the portal tomb at Lissava TS075-045 near Cahir, *c.* 18 km south of Cashel. In Rathcoun townland southwest of Cashel four undated barrows TS060-107007–TS060-107010 and one unclassified cairn TS060-107011 are recorded clustered together.

A number of the metal artefacts now in the National Museum of Ireland have been assigned in the Early Bronze Age period (Grogan 2005, Fig. 3.1–3.4, 24–29) – see Appendix i below. Recently three standing stones have been identified northeast of Cashel and are now RMP sites: Palmer's Hill TS061-052, Corralough TS061-053 and Ballyknock TS061-054 – these may date to sometime in the Bronze Age and significantly are located along the prominent Ballyknock ridge, as is a newly discovered ploughed-out burnt spread / *fulacht fiadh,* overlooking many of the N8 Bypass prehistoric sites (O'Brien 2003 17–26; O'Brien 2006, 15–23; O'Brien 2007, 87–96; O'Brien 2009,

72–4). Other recent discoveries around Cashel have been made from field walking including further ploughed-out burnt spreads / *fulacht fia* in Ballinamona (two sites), Ballinree (one site), Carron (two sites), Gortmakellis (one site), Kilscobin (one site) and Newtown (eight sites) (O'Brien 2008, 73–82), and artefacts such as a thumbnail scraper from Ballinamona, worked flint from Boscabell and Kilscobin, slag from Ballyknock, stone spindle whorls from Ballykelly, George's-Land and Ballinamona respectively, and a hammer stone from Ballinree and George's-Land (O'Brien 2003a, 48–52; www.facebook.com/rathnadrinna). These discoveries have been incorporated into the relevant final reports.

In later prehistory high status activity in the wider area is well represented; the discovery of two Late Bronze Age gold rings at Ardmayle, beside the River Suir and dated to the late 13th – early 12th centuries BC (Cahill 1989, 146), a Late Bronze Age Class IV sword from Aughnagomaun dated *c.* 700 BC (O'Brien 2007, 89–90), and a gold reel containing small gold balls (NMI W306) recorded as being found from Cashel (Cahill 1995, 66). The discovery of the Aughnagomaun sword is significant as earlier Middle / Late Bronze Age evidence was found in the same townland at (E2361) on the M8 North Project (Moore *et al* 2009, i). The lack of Bronze Age settlement sites was highlighted by Doody (1997, 94).

Iron Age Cashel was best represented in literature and with very occasional archaeological discoveries: the Clonura leather shield, *c.* 20 km northeast of Cashel. However recent excavation in advance of development has identified potential and definitive Iron Age sites: the discovery of a blue glass bead in Deerpark (Sherlock 2008, 350) may point to Iron Age activity and in the wider Cashel area a possible ritual site in Knockgraffon. The latter site consisted of an arc of eight postholes dated to 380–50 cal BC (SUERC–25889) while an internal posthole to the arc was contemporary, dated to 380–90 cal BC (SUERC–25890). Artefacts recovered included unidentified prehistoric pottery, a polished stone axe, three highly polished stones, two copper-alloy fragments and cremated bone (MacLeod 2012, 200–1).

Although Cashel was located on the south-eastern periphery of the Discovery Programme's North Munster Project nevertheless its inclusion saw a number of sites traditionally and locally classified as ringforts re-classified as prehistoric. Upstanding monuments such as Camus TS060-028 [classified as a ringfort on www.archaeology.ie], Carron / *Rathnadov* TS069-002001 [also classified as a henge], Knocksaintlour TS060-179, Lalor's-Lot / *Rathnadrinna* TS061-089001 and Windmill TS061-072 were classified as hilltop enclosures (Grogan 2005, Fig. 7.6, 116). A number of other monuments perhaps could be added to this list; Ballyknock TS061-008 due to its very prominent location at over 180 m OD, Hughes'-Lot East enclosure 05E0671 (143 m OD), Rathordan TS061-

074 at 140 m OD, and the multi-ramparted Ballinree TS060-110 are worthy of future study. Based on current evidence the nearest hillfort to Cashel is Kedrah TS075-040, located on the eastern side of the River Suir near Cahir, *c.* 16 km south of Cashel. The only definitive crannog in south Tipperary is recorded from Marhill TS069-072 just south of Rockwell College. Significantly this site is located in the same townland as a Middle Bronze Age site (E2269) and Medieval sites (E2124 & E2268) discovered on the M8 Cashel to Mitchelstown Road Project (see below).

The *Dhuvcloy* earthwork TS061-022 (road / hollow-way) in Charterschool Land TS061-022 has recently been associated with kingship processional rites (Gleeson 2012). In the extents of the Lands of Monecurialy of 1688 the highway from Cashel to Deansgrove was mentioned and the blacke ditch commonly called the *Doocly* (Davis White 1863, 5). Another road TS060-025 which serves as the townland boundary between Farrananagh and Rathcoun is now classified as a redundant record (www.archaeology.ie/NationalMonuments/Flex/Viewer/). However on the 1st Edition OS six-inch map the boundary is shown as *Boheragaddy* and a much earlier reference and description of *Bothar Gadie*, 'a double-ditched road (*a biffosario lapideo*)' is found in an Inquisition taken at Clonmel in 1553 (Curtis 1941, 15). In the same source another road called *Botherewolyngyhy* has been equated with Windmill (www.logainm.ie).

Exotic material is represented by the Roman-period occultist's stamp from Spital-Land in Golden, *c.* 7 km west of Cashel (Bateson 1973, 74), and the Roman-type fibula, a dolphin brooch (Type H), the earliest datable find from the Rock of Cashel (Cahill 1982a, 101). The evidence of international trade is further represented by Romano-British pottery sherds and Bii amphorae sherds from the Rock of Cashel; the Bii amphorae were also found at Derrynaflan *c.* 15 km northeast of Cashel (Kelly 2010, 59–60). Other well-known objects from Cashel include bronze bells, a silver brooch (decorated with Scandinavian thistle design from the late Norse period), a gilded copper crozier-head (set with turquoise and sapphire), the Kennedy-Crux Crozier, the silver-gilt Cashel Pyx, and various chalices and seals (Wyse Jackson 1956, 18–20; see Appendix i). A rare zoomorphic pennanular brooch dated to *c.* 600 AD was found in *Loughnafina*, west of Cashel town (Henry 2000, 200–1).

Early medieval Cashel is well attested in historical sources with the dominance of kings on the Rock under *Éoganachta*, *Uí Briain* and *Meic Carthaig* dynasties (see Historical Background below; Hodkinson 1994; Collins 1997; Gleeson 2012). In Rathcoun a complex of ecclesiastical sites include a church TS060-107002, recorded as *(site of) Templemobee* [Mobhi], the unclassified religious house TS060-107003 *(site of) Monastery*–the only monastic site marked around Cashel

and holy well TS060-107004. Rathcoun and Templenoe are two townlands southwest of Cashel that preserve the word 'temple' in their name.

The plethora of ringforts and possible *Óenach* sites in the region point to a vibrant early medieval hinterland. Some of the forts around Cashel are recorded in historical sources. In the *Life of Saint Declan of Ardmore* a stone fort called *Rath na nIrlann* is specifically identified as being on the western side of Cashel (Power 1914, 28) – this fort may equate with Ballinree TS060-110. *Lis na nUrlann* (location unknown) is recorded in the Yellow Book of Lecan as being associated with the twelfth-century inauguration of the kings of Munster (Fitzpatrick 2004, 178–9). In a description of the lands of James Boiton recorded in the Calendar of the Patent and Close Rolls Elizabeth I 1594–6 local names such as '*High Rathe on the east'* and '*the lands of Asmon, otherwise Boiton Rath'* [Boytonrath] are recorded (Morrin 1862, 392). Could the '*High Rathe on the east' either* be referring to one of the Ballyknock forts TS061-008 or else to the Hughes'-Lot East enclosure [05E0671], (see below)? In the Patent Rolls of James I, Pat. 7 *c.* 1610 the following entry for the Windmill area is very informative – '*the stone house, towns and lands of the Windmill, Fleming's Rath, and Parkinigrogory in the southern part of Cashell*' (IMC 1966, 146). Could *Fleming's Rath* be Windmill hilltop enclosure TS061-072?

King Brian Uí Briain is recorded as fortifying Cashel *c.* 995 (AI) - this annalistic reference may not be restricted to fortifying of the Rock itself. King Muircheartach Uí Briain had a house at Cashel *c.* 1091(AFM) and within 10 years had handed over the Rock to the church in 1101 (Bracken & Ó Riain-Raedel 2006). Cormac's Chapel, with its' renowned Romanesque architecture was consecrated in 1134 (Ó Carragáin 2010). Although the OPW-funded excavations of the 1990's on the Rock still remain unpublished, two of the burials excavated in Area 1 have been dated by the Mapping Death Project to cal AD 1029–1155 and cal AD 1033–1155 (Gleeson 2013, 22). These burials are contemporary with activity at two of the bypass sites: oats from the lower fill of a cereal-drying kiln in Boscabell (Site 19, 03E0426), and a single adult femur displaying trauma, from the upper levels of the Hughes'-Lot East bivallate fort (Site 25ii, 03E0730); see respective final reports.

The archaeological inventory for South Tipperary has been updated and new data added to RMP sites around Cashel, see www.archaeology.ie. A recent rural excavation unearthed evidence of a ploughed-out ringfort / enclosure at Hughes'-Lot East (Hurley 2005, 348). Significantly, this site was located on a hillock to the southeast of the town, and its discovery suggested every such elevated location around Cashel was utilised as some form of defended settlement.

The last 20 years witnessed profound development changes in and around Cashel town itself, with a corresponding increase in the number of licence archaeological excavations taking place (Hughes &

Ó Droma 2011, 19–20). Despite the large number of investigations little in the way of pre-13th/14th century AD material has come to light, equally compounded by a lack of publication. One of the more significant Cashel excavations was that in Friar Street in 1998 (O'Donovan 2004). New discoveries are still being made in Cashel town: a medieval carved head in the Dominican Friary (O'Brien 2010) and, a carved capital, probably from the Franciscan Friary was found built into a wall on the Dualla Road in Hughes'-Lot East (Hughes 2011).

A number of Anglo-Norman moated sites are recorded around Cashel including an elevated example at Windmill TS061-167 and one at Boscabell TS061-027, which was located close to the edge of the bypass (Sites 18–20). Gortmakellis tower house TS061-011 is a fine example of a five-storey late medieval structure, and the bypass was designed to avoid all impacts on this castle and its' environs.

Recent NRA Excavations Around Cashel

From 2005–7 archaeological discoveries around rural Cashel greatly increased - south of Cashel as far as the county boundary with Limerick on the M8 Cashel to Mitchelstown road and north of Cashel as far as the county (and provincial) boundary with Kilkenny on the M8 Cullahill to Cashel road. These excavations revealed sites containing multi-period activity similar to that found on most of the Cashel excavations too.

The following list summarises the archaeological excavations made south of Cashel on the M8 Cashel to Mitchelstown Road Project, final reports for which were produced in 2007 (all townlands are in Co. Tipperary unless otherwise stated).

Neolithic sites - Suttonrath (E2128), Caherabbey Lower (E2266), Loughfeedora (E2292) & Caherabbey Upper (E2298)

Early Bronze Age sites - Ballylegan (E2265), Ballydrehid (E2267), Cloghabreedy (E2273), Dogstown (E2288), Dogstown (E2289), Templenoe (E2290), Racecourse Demesne (E2297), Caherabbey Upper (E2298), Caherabbey Upper (E2299), Carrigane (E2303 Co. Cork) & Brackbaun (E2338 Co. Limerick)

Middle Bronze Age sites - Killemly (E2126), Suttonrath (E2128), Ballydrehid (E2267), Marlhill (E2269), Knockgraffon (E2270), Knockgraffon (E2271), Cloghabreedy (E2273), Cloghabreedy (E2274), Shanballyduff (E2275), Dogstown (E2289), Clonmore North

(E2294), Raheen (E2295), Lissava (E2296), Caherabbey Upper (E2299), Carrigane (E2303 Co. Cork), Brackbaun (E2306 Co. Limerick) & Brackbaun (E2339 Co. Limerick)

Late Bronze Age sites - Killemly (E2126), Suttonrath (E2128), Ballylegan (E2265), Ballydrehid (E2267), Knockgraffon (E2270), Cloghabreedy (E2274), Loughfeedora (E2292) & Caherabbey Upper (E2299),

Iron Age sites - Killemly (E2126), Ballylegan (E2265), Caherabbey Lower (E2266), Ballydrehid (E2267), Knockgraffon (E2270) & Knockgraffon (E2272),

Medieval sites - Marlhill (E2124), Marlhill (E2268), Suttonrath (E2127), Ballylegan (E2265), Knockgraffon (E2271), Tincurry (E2293) & Brackbaun (E2339 Co. Limerick)

Post Medieval sites - Loughfeedora (E2291) & Cloheenafishogue (E2302).

The following list summarises the archaeological excavations made north of Cashel on the M8 Cullahill to Cashel Road Project, final reports for which were produced in 2010 (all townlands are in Co. Tipperary unless otherwise stated):

Neolithic sites - Borris (E2491), Fennor (E2384) & Islands (E2388, Co. Kilkenny)

Late Neolithic sites - Gortmakellis (E2816)

Early Bronze Age sites - Borris (E2378), Borris (E2491), Inchirourke (E2383), Fennor (E2384), Fennor (E2385), Islands (E2386, Co. Kilkenny), Islands (E2388, Co. Kilkenny) & Warrenstown (E2390, Co. Kilkenny)

Middle Bronze Age sites - Parkstown (2368), Rathcunikeen (E2372), Borris & Blackcastle (E2374), Borris (E2375), Borris (E2376), Borris (E2378), Borris (E2379), Inchirourke (E2383), Islands (E2386, Co. Kilkenny), Islands (E2387, Co. Kilkenny), Islands (E2389, Co. Kilkenny) & Foulkscourt (E2391, Co. Kilkenny)

Late Bronze Age sites - Aughnagomaun/Ashhill (E2361), Ballydavid (E2370), Coolcroo (E2818), Borris (E2376), Inchirourke (E2382), Islands (E2386, Co. Kilkenny), Islands (E2388, Co. Kilkenny), Islands (E2389, Co. Kilkenny), Foulkscourt (E2391, Co. Kilkenny) & Glashare (E2394, Co. Kilkenny)

Iron Age sites - Coolkip (E2362), Coolkip (E2363), Ballydavid (E2370), Borris (E2376), Borris (E2491), Inchirourke (E2382) & Glashare (E2394, Co. Kilkenny)

Early Medieval sites - Parkstown (2368), Ballydavid (E2370), Borris (E2376) & Borris (E2491)

Late Medieval sites - Moycarky (E2365), Moycarky (E2366), Moycarky (E2367), Parkstown (E2368), Borris & Blackcastle (E2374), Borris (E2376) & Inchirourke (E2382)

Post Medieval sites - Borris & Blackcastle (E2374)

The results of some of these excavations are incorporated into various Cashel final reports, can be viewed at www.nra.ie/archaeology and see McQuade (2009, 2, Table 1.1). The apparent lack of Mesolithic discoveries on either of these major road projects was mirrored on earlier infrastructure projects in south Tipperary - the Gas Pipeline of 1981–2 (Cleary 1987, vii), the Gas Pipeline of 1986 (Gowen 1988, vii), the Lisheen Mine Project 1996–8 (Gowen 2005, 61), and more recently again from the research excavation at Curraghatoor (Cleary 2007, 39). Clearly then, the hinterland of Cashel, where four townlands spread across the bypass produced Mesolithic material and/or radiocarbon dates, featured significantly in the movement of both people and materials during the Mesolithic. This movement was in no small part facilitated by Cashel's closeness to the River Suir.

Recent Geophysical Investigations Around Cashel

Between 2009–12 a number of research-led geophysical surveys were conducted on a number of sites around Cashel. Earthsound Archaeological Geophysics Ltd undertook geophysical surveys at Rathnadrinna fort TS061-089001 and TS061-089002 in Lalor's-Lot. This work revealed complex multi-period sites, with evidence of large-scale earthworks predating the known fort (O'Brien *et al* 2011, 26). Also in 2011 Earthsound undertook geophysical survey at Hughes'-Lot East (Site 25ii, 03E0730) in order to identify the full extent of the Early Medieval ringfort beyond the CPO (Bonsall 2012). The western edge of the ringfort was identified and the results have been incorporated into the final report for that site. Further research work centred on Windmill Hill sites TS061-072, TS061-073 and TS061-167 in 2011 by UCC and the University of Bradford / NRA and in 2012 by Earthsound Archaeological Geophysics identified archaeological features, some of which appeared to relate to the activity discovered on sites 31–36i (Gimson 2012). These results are incorporated into the various Cashel final reports.

Appendix i: Catalogue of objects from Cashel in the National Museum of Ireland

Object: Copper alloy harness mount
NMI No: 2004:178
Find-spot: Ballytarsna
Description: Copper alloy harness mount found by Mr. Alfie Coyle in a potato field on the southern side of the old N8 road, near the junction with Killock Quarry.

Object: Medieval pot sherd
NMI No: 2004:146
Find-spot: Rock of Cashel, surface find at exterior base of Cathedral south wall
Description: Curved pot sherd probably belonging to a medieval vessel. The outer surface of the sherd is glazed. This glazing is green in colour with random dark green and brown dots. On one area of the outer surface of the sherd, there are traces of five incised lines. Max L 5.25; max W 3.28; T 6.90

Object: Socketed iron axehead
NMI No: 2002:88
Find-spot: St. Patrick's Rock, garden of Mr. Dinny O'Brien
Description: Iron axehead with modern iron spike thru the shaft hole. The axehead has a widely splayed blade the sides of which curve inwards towards the shaft hole. This is triangular in shape and folds back to form the perforation to take the handle. In poor condition. Max L of axehead 13.15; W of blade10:00; max T of blade, max 2.1

Object: Copper alloy ferrule
NMI No: 1992:29
Find-spot: Garden in Dogstown, New Inn
Description: Copper alloy ferrule, decorated bronze mount

Object: Wood
NMI No: 1984:107
Find-spot: Curraghtarsna, Cashel
Description: Trough of *fulacht*, reused from a dug-out canoe. Excavated timber C14 dated to 3120_35 BP (GrN 12618)

Object: Bronze spearhead or javelin head
NMI No: 1968:285
Find-spot: Cashel
Description: Rounded blade with ornamental deep grooves close to the ridge of the socket, broad ribbon loops on the large squat socket. l. 6.4cm, l of loop 1.5cm, w of loop 2.1cm, diameter of socket mouth 2cm

Object: Bronze spearhead or javelin head
NMI No: 1968:282
Find-spot: St john Baptist Cashel
Description: Bronze spearhead, socketed, looped, with bevelled edges on the blade and decorative ribbing. Conical socket. Loops are lozenge-shaped and placed midway between blade and mouth of socket. l.11.3cm, l of blade 6cm, w of blade 3.5cm, l of loop 1.8cm, diameter of mouth 1.9cm

Object: Iron spike
NMI No: 1953:9
Find-spot: Hummocky' field near Ballysheehan Motte-and-Bailey
Description: Iron spike

Object: Fragment of an iron horseshoe
NMI No: 1953:10

Find-spot: Hummocky' field near Ballysheehan Motte-and-Bailey,
Description: Fragment of an iron horseshoe

Object: Five medieval pottery sherds
NMI No: 1953:11–5
Find-spot: Hummocky' field near Ballysheehan Motte-and-Bailey
Description: Five medieval pottery sherds

Object: Bronze spearhead
NMI No: 1938:8589
Find-spot: Cashel vicinity
Description: Bronze spearhead

Object: Socketed bronze axehead
NMI No: 1937:3678
Find-spot: Cashel vicinity
Description: Socketed bronze axehead

Object: Silver seal matrix
NMI No: 1912:59
Find-spot: Co. Tipperary
Description: Matrix of seal silver with a green stone set inside. The device on the stone is a sea horse. The legend reads S.IOKIS-CASELL-ARCHID. The matrix was formerly in the possession of Sir William Betham. It has been in the RIA collection for many years. The seal measures 1 1/6inch x 15/16inch.

Object: Stone adze
NMI No: 1909:33
Find-spot: Near Cashel
Description: Of very unusual form, of close grained hard black stone. It measures 9 & 1/8 in length and 2 ½ in breadth. It has a label gummed on which reads "ancient Irish stone adze found at Cashel Co. Tipperary."

Object: Casts of Cormac's Chapel north doorway
NMI No: 1911:5
Find-spot: Rock of Cashel
Description: Casts of cormac's chapel north doorway also arcading from interior and side of ornamented stone coffin.

Object: Bronze axehead
NMI No: 1892:49
Find-spot: Near Cashel
Description: Socketed celt. Bronze looped cutting edge curved socket fractured filleted near mouth. Extreme length 2 1/4in. greatest width 1 7/8in. external diameter at mouth of socket 1 ¼in.

Object: Copper axehead
NMI No: 1881:133
Find-spot: Dundrum, found in 1842
Description: Copper, broad and flat, surface rough, narrow and straight large gaps in one end of cutting edge, workmanship very rude. Extreme length 6 ½inches thickness at centre ¼inch, greatest width 4 inches, width at narrow end 1 ¾inches

Object: Bronze axehead
NMI No: 1880:15

Find-spot: From Cashel
Description: Socketed celt, bronze, brownish, patinated, looped, cutting edge curved, mouth if socket nearly round portion battered by hammering, length 2 7/8in. width at cutting edge 2 ¼in. greatest external diam. Of socket 1 ½inch

Object: Silver paten
NMI No: 1880:98
Find-spot: Found when digging a grave in burial ground adjoining Cormac's Chapel, Rock of Cashel
Description: Silver circular and thin rim broad and flat centre portion slightly concave cracked in several places part of rim detached diameter 4 ½in width 5/8ths inch length detached portion 3 11/16ths inches wt. 1oz. 9dwt. 11gr.

Object: Silver coin Edward II
NMI No: 1875:122
Find-spot: Northeast part of Cathedral, Rock of Cashel
Description: Edward II, found with Bronze pin No. 121

Object: Bronze pin
NMI No: 1875:121
Find-spot: Northeast part of Cathedral, Rock of Cashel
Description: Pin bronze, stem tapering to a fine point and slightly diminishing towards head, on upper half of its length ornamented with diagonal hatchings, head formed by two horse's faces turned outwards, length 3 5/8inches, and greatest thickness of stem more than 1/8inch

Object: Copper and silver coins
NMI No: 1877:16
Find-spot: Cashel
Description: Copper square Youghal Token 9/16 inch square.
Silver Mecklenburg shilling

Object: Iron key
NMI No: 1877:12
Find-spot: Cashel
Description: Iron brown much rusted, pipe in shank, bow semi-oval and attached to shank by two scrolls. Extreme length 3 3/8inches, greatest width of bow 1 15/16inch. Measurement across shank and bit 1 inch

Object: Stained glass
NMI No: 1877:11
Find-spot: Cormac's Chapel, Rock of Cashel
Description: Fragment of stained glass. Greenish with reddish brown stripes. Portion of latter forming lozenge shaped ornamentation with central circlet of same colour. Pattern similar to that of fresco painting on walls of Cormac's Chapel, in which structure it was found. Greatest length 1 ¾inch, extreme width 1 ½inch

Object: Bell metal portions
NMI No: 1877:10
Find-spot: Cormac's Chapel, Rock of Cashel
Description: Portions of bell metal (2) brownish green, respective measurements 1 ½inch x 7/16inch, and ¾ inch x ½inch

Object: Copper alloy Lion
NMI No: 1877:1
Find-spot: Found in open space between Cormac's Chapel & Cathedral, Rock of Cashel

Description: Brass lion, greenish in sitting posture, rectangular socketed projection in rear of hind legs, base oblong and irregularly rounded in front, height 2 ft 20inches length of base 7/16th inch width 5/8th inch

Object: Glass fragment
NMI No: 1877:14
Find-spot: Cashel
Description: Greenish grey remains of 'bull's eye' on one of the faces. Extreme length 3 1/8inches greatest width 1 ¼inch greatest thickness 5/8inch

Object: Wooden bow
NMI No: R:2470
Find-spot: Near Dundrum
Description: Wooden bow, found in the moat of a square rath near Dundrum

Object: Gold bracelet
NMI No: W307–309
Find-spot: Cashel
Description: Three individual gold bracelets

Object: Gold ball & reel
NMI No: W306
Find-spot: Cashel
Description: Gold ball & reel

Object: Copper alloy bell
NMI No: W2 WK209
Find-spot: Cashel
Description: Copper alloy bell

Object: Bronze rings (262)
NMI No: W232–493
Find-spot: Cashel
Description: Bronze patinated and tarnished. Apparently solid. Annular but one is cut through showing it to be solid. Some are circular in cross-section. Some are regular on the inside and some seem to be rough or unfinished casting. The sizes range from 1.50 external diam with 1.40 internal diam to 2.90cm

HISTORICAL SOURCES

For the historical background to Cashel town and its environs see White (1863: 1866 & 1892), Gleeson (1927), Finn (1930), Bradley (1985), Fogarty (2000), MacShamhráin (2004), Marnane (2007), and more recently Marnane & Darmody (2011). Some key dates in the history of Cashel include:

AD 370 Traditional date of Kings of Munster ruling from Cashel.
448 Traditional date for Saint Patrick's visit to Cashel, and baptism of King Aengus.
580 Cairpre, King of Cashel died.
593 Feidlimid, King of Cashel died.
662 Maenach, King of Cashel died.
666 Cú-cen-Máthair, King of Cashel [& Munster] died.
713 The battle of Carn Feradaig, in which Cormac King of Cashel, died.
742 Cathal, King of Cashel died.
820 Feidlimid, son of Crimthann, took the kingship of Cashel.
821 Artrí, King of Cashel died.
847 The first recorded king-bishop of Munster died in Cashel.
976 Brian Boru was crowned King of Munster.
995 The fortifying [building] of Cashel, Inis Locha Gair, and Inis Locha Sainglenn, and many buildings besides, by King Brian Boru.
1093 Diarmait, son of Tairdelbach Ua Briain, submitted to Muirchertach, i.e. his brother, and they made peace and a covenant in Cashel and in Les Mór, with the relics of Ireland, including the Staff of Jesus, as pledges, and in the presence of Bishop Ua hÉnna of Cashel and the nobles of Mumu.
1095 Cashel [the Rock] was burned [cause of burning unknown].
1101 Muirchertach O'Brien, King of Munster bequeathed the Rock to the church.
1102 Cashel was attacked and burned by the *Éili* of north Tipperary.
1107 Cashel [the Rock] was burned by lighting.
1115 Cellachán Ua Cellacháin of Cashel was slain.
1118 Mael Sechnaill Ua Faeláin was treacherously slain in Cashel.
1127–34 Traditional date for the building of the Cormac's Chapel on the Rock.
1130's Benedictine monks settle on the Rock of Cashel
1141 The bishopric of Cashel was made Metropolitan.
1172 King Henry II of England presided over a synod in Cashel.
1178 Cashel was plundered by the Normans.
1179 Cashel [the Rock] was burned [cause of burning unknown].
1194 Tadc, son of Mathgamain Ua Briain, was put to death by the foreigners in Cashel, despite the protection of the legate Archbishop Ua hÉnne of Cashel and Patrick.
1216 Cashel was designated as a borough town.
1220's References to the old and new *vill* (town) of Cashel survive.
1224–37 Sir David Latimer founded a Leper Hospital of St. Nicholas in Cashel.
1228 King Henry III returned the town to the ownership of the Archbishop, and a Fair was granted.
1243 Foundation of the Dominican Friary of Cashel, north of the town wall.

1265 Foundation of the Franciscan Friary of Cashel, east of the town wall.
1272 Foundation of the Cistercian monastery of Hore Abbey, south of the Rock.
1279 Letters of protection for two years for Adam Stripling, merchant of Cashel, about by the King's licence to go to parts beyond the sea.
1317 Edward Bruce of Scotland visits Cashel during his invasion of the country.
1320 Grant to the bailiffs and worthy men of Cashel, in aid of enclosing the town with a stone wall, that they may take the following customs in the accustomed form for five years from every crannock of wheat, peas, beans and every kind of corn, 1d.
1346 Commission to Adam Preston of custody of the castle of Cashel, during the King's pleasure, with the accustomed fee.
1378 King Richard II confirmed all the privileges of Cashel' Corporation; in Cashel Royal Service was proclaimed.
1378 King Richard II learned that there was no law, justice or good governance in any parts around the town of Cashel, but rather rebellion, extortion, murder, killing, robbery and open war made by the King's Irish enemies and rebels upon that town, so that the provost and commons of that town can scarcely be kept without great relief by the King in this part.
1381 The town of Cashel was situated in the march and was so devastated by invasions of the King's enemies that it cannot support the household of the King's Lieutenant and other officers except in the houses of the Friars Preachers and Friars Minor of that town; and because of the destruction of the surrounding parts where the said friars are wont to receive alms for sustenance, they have scarcely enough on which to live. Order to pay the Friars Preachers 5m as an aid for repairing their church and houses.
1494 The Earl of Kildare, Gerald Mór burned St. Patrick's Cathedral, believing the bishop to be hiding inside!
1540 The religious institutions of Cashel were seized by the English Crown.
1581 During the Desmond Rebellion cattle raids in Cashel result in the deaths of 60 townsmen.
1637 King Charles II of England granted a Charter to the town: it was to be known as '*City of Cashel*'.
1622 Archbishop Miler Magrath of Cashel died.
1641 The town of Cashel was invaded by the O'Dwyer Clan and many English settlers killed.
1647 The Rock of Cashel was conquered by forces loyal to the English Parliament, led by Irish man Lord Inchiquin.
1687 King James II of England granted Cashel a Charter.
1749 The roof of St. Patrick's Cathedral was removed.
1869 Following a Parliamentary inquiry the Corporation of Cashel was dissolved.

Townland History

The name 'Windmill' is given to the fort, hill and townland, yet no structural remains exist of a mill or any such type structure in the vicinity. Logainm links Windmill and Hore Abbey together via the placename *Ballymolan* for the year 1275 {Archdall's Monasticon Hibernicum, 648 is the link}, and via the placename *Ballyvellane* for the year 1611 in the Calendar of Patent Rolls for King James I

(www.logainm.ie). Windmill townland has been associated with a named road recorded in the Ormond Deeds, Volume V. The association is found on www.logainm.ie and the original reference in the Ormond Deeds is as follows:

"*Inquisition taken at Clonmel Wednesday April 5th, 1553. Patrick Sale of Cashel forcibly entered upon a part of the King's way of said town leading from the double-ditched road (a biffosario lapideo) of that town to the similar road called Bothar Gadie and thence to the similar road called Botherewolyngyhy near said town, and made a great ditch on the said way, and forcibly occupies said part to this day to the grave damage of all the King's people going that way, against the King's peace, etc*" (Curtis 1941, 15). The description of the roadway as 'double-ditched' is significant when one considers a number of the townland boundaries around Cashel are high, flat-topped clay and stone banks with a deep ditch on either side. The best example is the Boscabell / George's-Land townland boundary at Site 22 which still contains metalling on the bank surface (McKinstry & Fairburn 2004a).

Calendar of Patent Rolls

The earliest definitive reference to Windmill townland is found amongst the Calendar of Patent Rolls for King James I. For the years 1609, 1611 and 1614 Windmill is listed. The most revealing entry is for 1609 referring to '*the stone house, towns and lands of the Windmill Fleming's Rath, and Parkinigrogory in the southern part of Cashell, ½ cople*' {Pat. 7 James I, 146} (IMC 1966, 146). The stone house (TS060-088001) and bawn (TS060-088002) are both still unidentified (see www.archaeology.ie).

Civil Survey for County Tipperary

In the Civil Survey for County Tipperary 1654 the following entry is recorded for Windmill, in the Parish of Patricks Rock:

"*Proprietor in 1640 Derby Ryan of Cashell Irish Papist. Windmill cont : fower colp Acres of ye old extent. Estimate of 181 plantation acres. Profitable lands 120 of arable and 61 of pasture. No lands unprofitable, £12 Value of ye whole & each of ye sd lands. The sd lands are bounded on the South with the lands of Logh Inidory in this parish, on the West with Knockbulloge in this parish, on ye North with Hoareaby in this parish ; & on the east with the Comons of Cashell. The sd Derby Ryan Inheritor by descent from his ancestors. The sd lands is at prsent wast without Impvemt.*" (Simington 1931, 225)

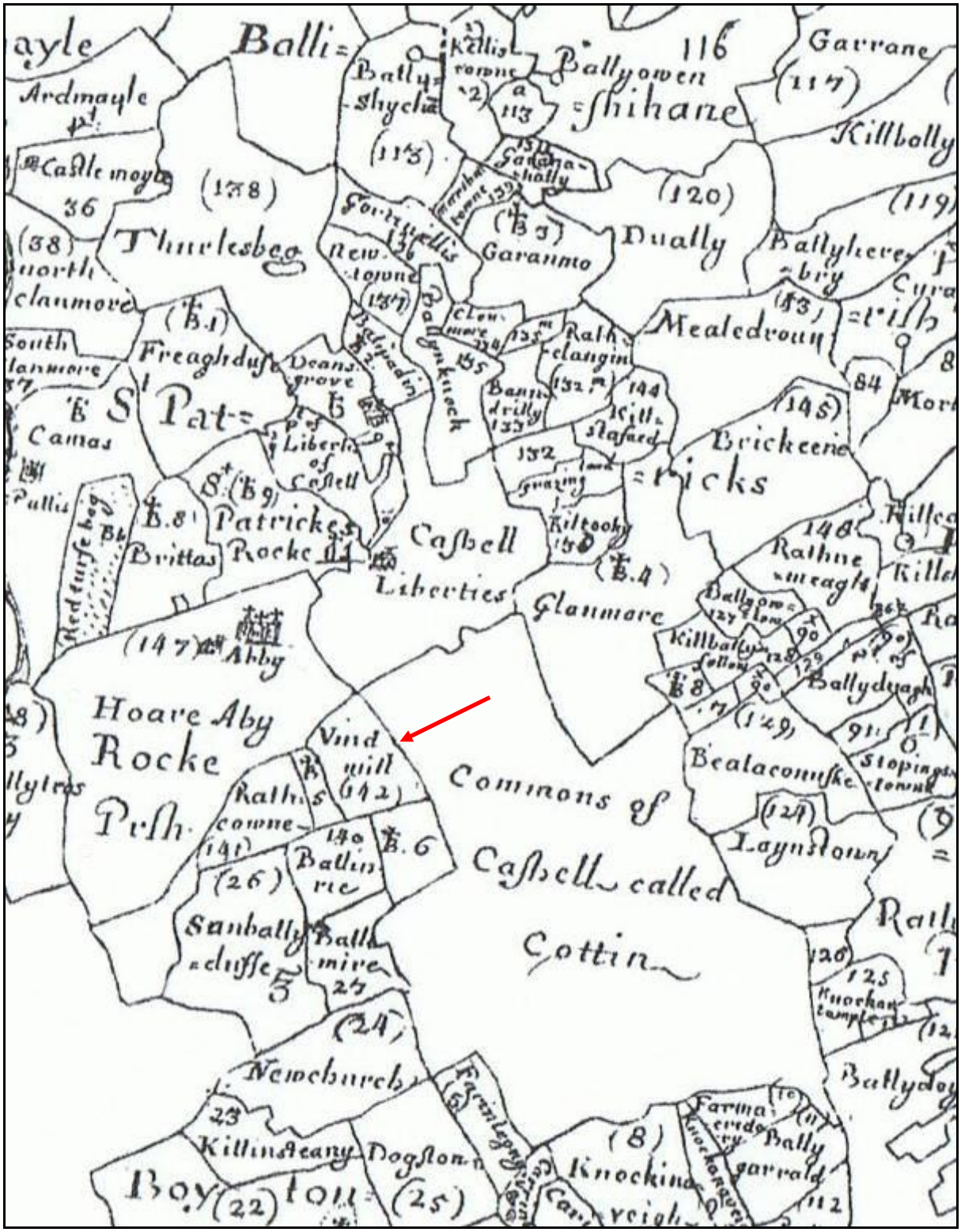

Figure i: Down Survey Map of the Barony of Middlethird by W. Petty, 1654. '*Vindmill*' was marked (142).

Books of Survey and Distribution for County Tipperary

In the Books of Survey and Distribution for County Tipperary, the following proprietors are listed in 1640 for St. Patrick's Rock, amongst the townlands investigated on the bypass:

Proprietor	**Townland**
Edmond Stapleton, Gortmakellis	Gortmakellis
Walter Sall, Garrane	Bandrilly & Clonmore
John Hanly, Cashel	Kilscobin
Derby Ryan, Cashel	Windmill

Table v: Extracts from the Book of Survey and Distribution for St. Patrick's Rock, 1640

There is no one recorded as living in Windmill in the Census of Ireland for 1659 (Pender 1939).

Tipperary Hearth Money Records

In the Tipperary Hearth Money Records can be found the following information for those townlands where excavations took place on the bypass:

[Year] 1665 Baronia de Midlle Third. Parochia De St. Patrick's Rocke		
[Name]	Hths.	*s.*
John Kearney, de Kyllscobyne	1	2
James Hyad	1	2
Math. Pennyfeather, Gorttmcellis	2	4
Hugh Sterman, Rathordan	1	2
Thomas Kealy	1	2
Teige Kealy	1	2
William Dwegin	1	2
Edmond Rushell, Windymill	1	2

Table vi: Tipperary Hearth Money Records for 1665 (Laffan 1911, 13)

[Year] 1666-7 Barony of Middlethird. Parishes of St. Pates, Rock…					
[Name]	Hths.	*s.*		Hths.	*s.*
*Ballyfarsny			Rathdangin		
Edmund Leary	2	4	Morrish Hackett	1	2
Richard McJames	1	2	Richard Brittine	1	2
Connor Harrell	1	2	Donnogh Carny	1	2
Teige O'Kelly	1	2	James Head	1	2
Daniel Scully	1	2	Richard Carny	1	2
John Boyton	1	2	Windmill		
Teige Rian	1	2	Edmund Russell	1	2
Gortmaceill	Hths.	*s.*	Rathordane	Hths.	*s.*
Mathew Pennyfather	2	4	Thomas Kelly	1	2
William Hackett	1	2	James Woodlocke	1	2
Edmond Lahy	1	2	Teige Kelly	1	2
Gerald Listune	1	2	Thomas Hickey	1	2
David Nolane	1	2	John Kent	1	2
			John Carny	1	2
Killscobin	Hths.	*s.*			
Mr. Richey	1	2			

*Most likely this is Farnamanagh as it is in the Parish of St. Patrick's Rock and next to Hoar Abbey.

Table vii: Tipperary Hearth Money Records for 1666-7 (Laffan 1911, 97-8)

Mr. Edmund Russell is the only named individual for Windmill. Could Mr. Russell's dwelling have been the stone house referred to in the Calendar of Patent Rolls for 1609?

Smith-Barry Cashel Estate

Much land around Cashel had been granted to the Protestant Mr. Erasmus Smith [later of the Smith-Barry estate] for services rendered to the Crown following the Cromwellian confiscations in 1652. Windmill is listed amongst Smith's lands in 1670, now comprising 167 plantation acres of profitable land all fortfeited to the Crown, a reduction from the 181 plantation acres recorded from 1640 (www.downsurvey.tcd.ie/landowners). In 1702 Windmill *alias* Miltowne is listed amongst lands in a settlement between Mr. Standish Hartstonge and Erasmus Smith, (Limerick Papers NLI, 11). One of the descendants, John Smith-Barry inherited these lands in 1755 and Windmill formed part of the grant. In his analysis of the Smith-Barry Estate valuable information relating to townlands investigated during the bypass has been recorded by Marnane (2001).

Tenant	Denomination	Acres	Rent p.a.	Tenure
Barnaby Phelan	Gortmakellis, Newtown & Clonmore	260	£79	3L/1740
Wm. Pennefather	Monadreela	73	£18	3L/1729
Richard Lockwood	Windmill & Ballinree	318	£80	3L/1731

Table viii: The Smith-Barry Cashel Estate c. 1755. 'Irish acres, 3L = three lives from that date' (Marnane 2001, 99)

Richard Lockwood is the only tenant listed for Windmill.

Tenant	Denomination	Rent p.a.
Barnaby Phelan	Gortmakellis	£79
Thomas Pennefather	Monadreela	£72
Sundry tenants	Monadreela	£116

Table ix: Rental of Smith-Barry Cashel Estate November 1813 (based on Marnane 2002, 60–1)

Richard Lockwood is no longer listed as tenant for Windmill.

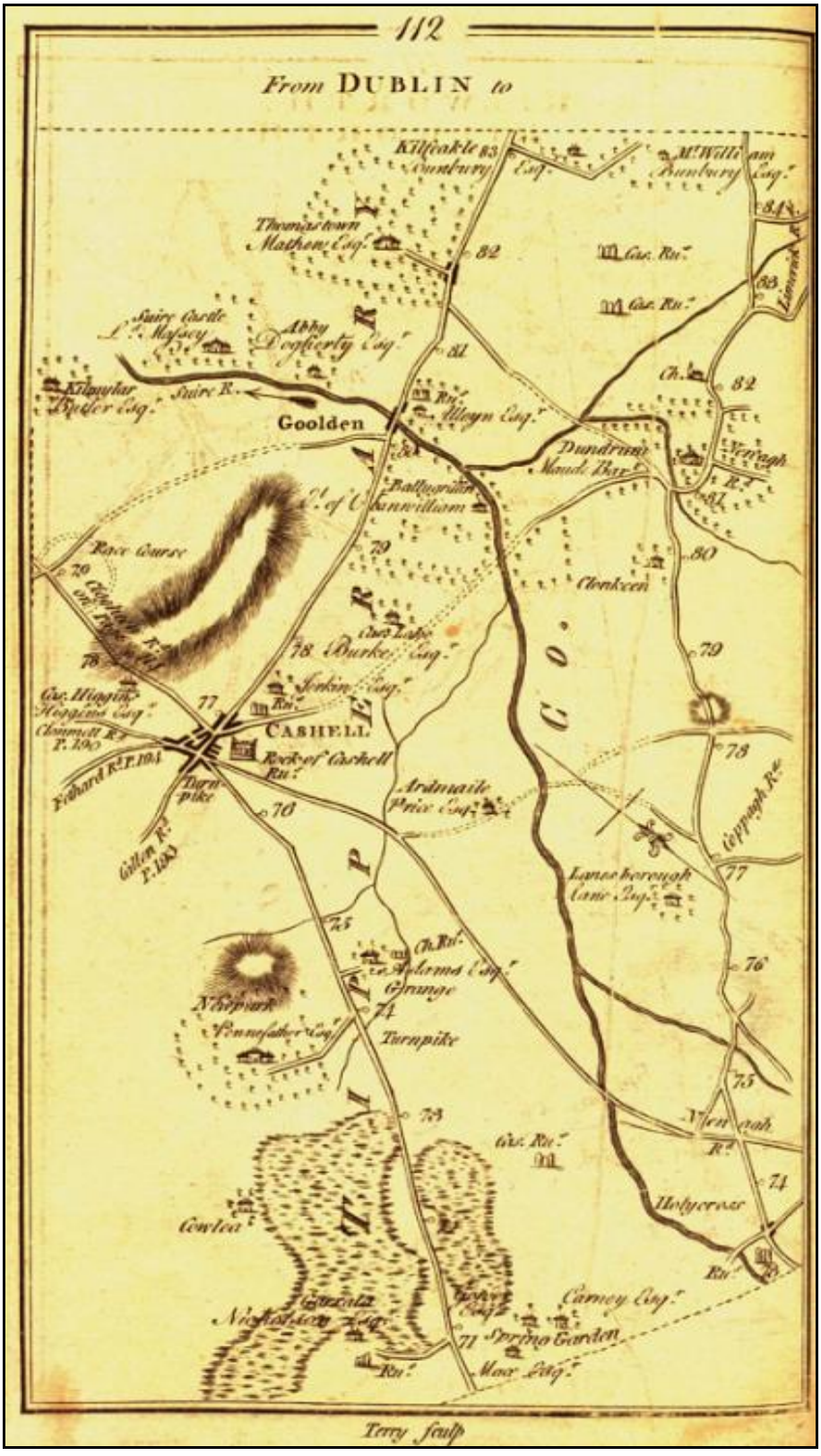

Figure ii: Taylor Skinner Road Map 1778 showing the Cashel to Golden road. Windmill was not indicated.

Tithe Applotment Books for Cashel

In the Tithe Applotment Books for Cashel dating from 1827 47 surnames are listed for Windmill/Wuid, although many of these entries are duplicates (www.titheapplotmentbooks.nationalarchives.ie). Both Mr. J. Smith-Barry and Mr. Thomas Kennedy were still listed in the Griffiths Valuations (see below). Windmill was located outside the remit of Cashel Corporation.

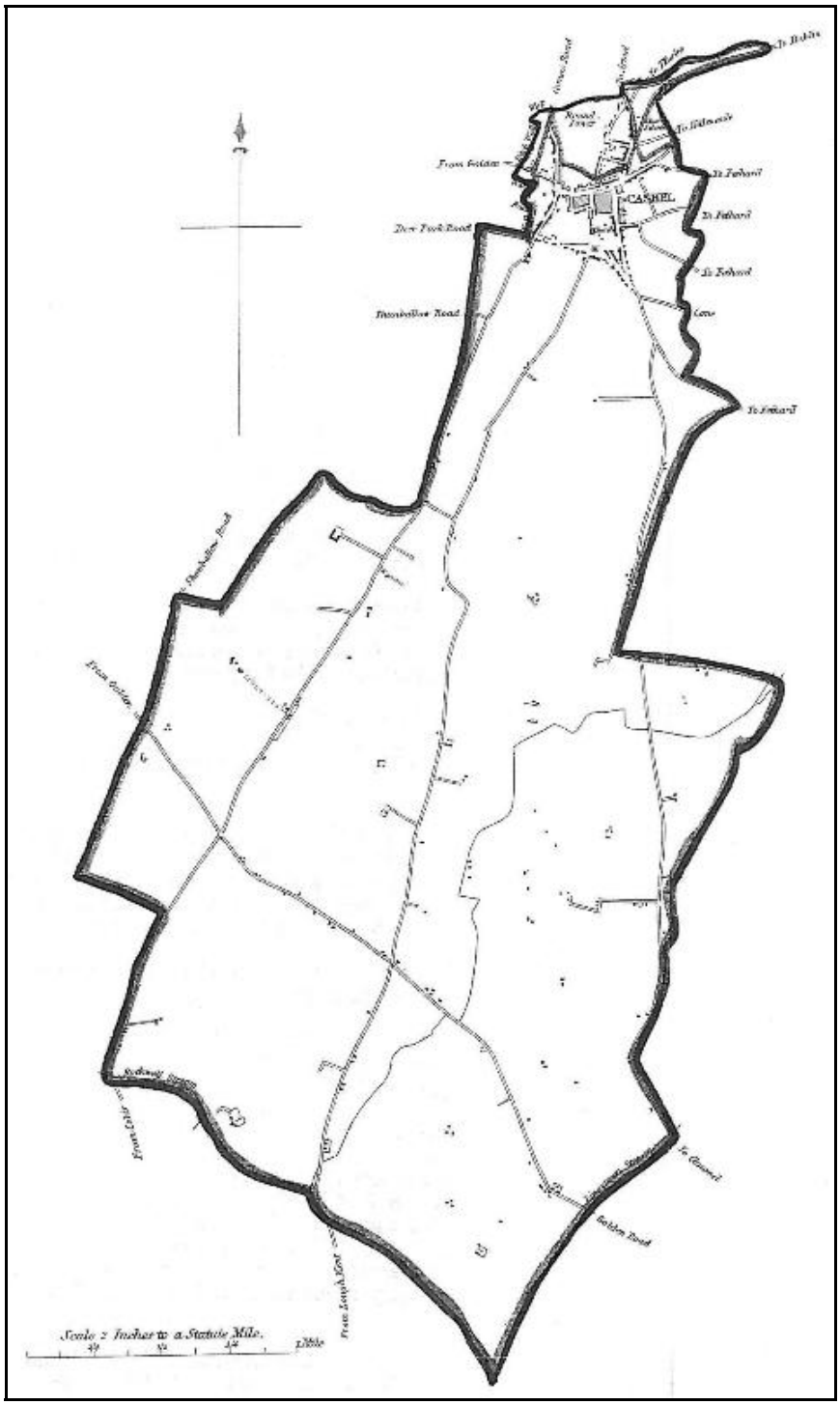

Figure iii: Municipal Corporation Boundaries (Ireland) Proposed Municipal Boundary of the Borough of Cashel, December 1831.

Ordnance Survey Namebooks for Co. Tipperary 1840

Windmill is recorded as follows:

'*Windmill or Milltown. Baile An Muillin, town of the mill. Windemill--Down Survey. West of & bordered by the road from Cork to Cashel bordering the Parish of St. John's and in the By. of Middlethird. Is all under tillage and pasture here is a circular fort close to which are some ancient walls. Are they the ruins of the Leper House said to have been founded in Ballinree by Sir David Le Lattimer.*' (O'Flanagan 1930, 141).

Separately under 'Ruins' the following information is provided:

'*Ruins of Church or Leper's Hospital}—Field Exr. Ruin of Leper Hospital—J.O'D. Leper Hospital (in ruins). T. land of Windmill or Milltown By. of Middlethird County Tipperary. Close to Old Church and on Eastern boundy. of the Ph.*' (ibid, 147)

Ordnance Survey Letters for Co. Tipperary 1840

Under the title '*Chronological history of Cashel from the various annals, and descriptions of the antiquities*' the following information is relevant:

'*Cashel (County of Tipperary) (Gough's Camden). The new Town of Cashel was granted by the Pope 1224 to Archbishop O'Brien, who granted or confirmed it to a Provost, Knights, Burgesses and his Seneschal. Sir David le Latimer founded here a Lazar house united to the Cistercian Abbey 1272 (Archdall 647).*' (ibid, 135).

In the same source under 'Hospital' the following information is recorded:

'*Hospital. An hospital for sick and infirm poor, with 14 beds and 3 Chaplains was founded here to the honour of St. Nicholas by Sir David le Latimer, Seneschal to Marian, who was Archbishop of Cashel from the year 1224 to 1238 (War. Bps. p.471; King p.407); the said Archbishop granted to this hospital two flagons of ale out of every brewing made for sale within the limits of 30 messuages in this town (King, p.404) and David, a succeeding prelate, did by force and violence unite the hospital to the Cistercian Abbey about the year 1272 – (War. Bps., p.471).*' (ibid,141).

This date is significant in relation to the traditional date for the founding of a Leper Hospital in Cashel by Sir David Latimer, seneschal to Archbishop Marian O'Brien around 1230 AD (Long 1897, 27).

1st Edition OS six-inch map

There are substantial remains of the Leper Hospital visible on the 1st Edition OS six-inch map, to the northeast of the Windmill enclosure and north of a quarry (Figure iv). The longer axis of the building is aligned east/west, the building appears complete and is indicated as 'Leper Hospital (*in ruins*)'. A trigonometrical point (trig. point) (height 481 feet) is shown on the northern bank of the enclosure. A north/south aligned field boundary separated the Hospital from the hilltop enclosure. The field containing sites 31–35 is much longer (at 27.86 acres) extending northward towards Cashel town, with no internal field boundaries.

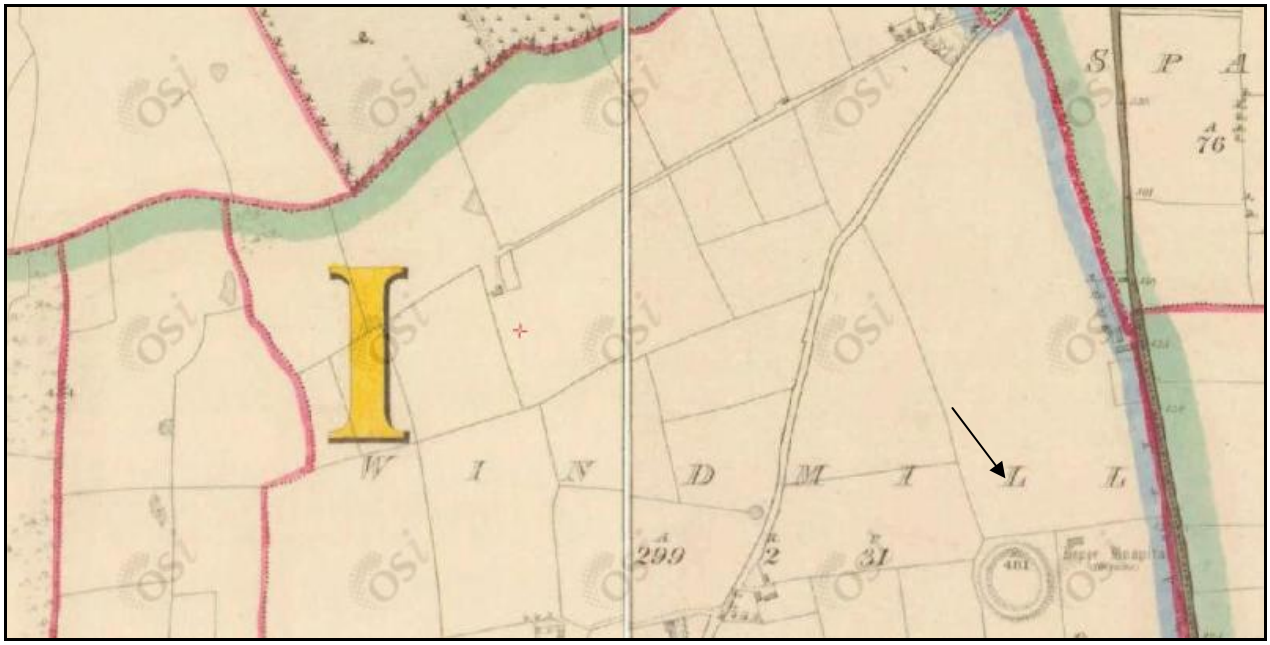

Figure iv: 1st Edition OS six-inch map 1840, Site 35 indicated. Source: www.osi.ie

Census Returns for 1841 & 1851

These census returns reveal the full extents of the Great Irish Famine in the Cashel area.

Census Year		**1841**				**1851**		
Townland	**Houses**	**Male**	**Female**	**Tot. Persons**	**Houses**	**Male**	**Female**	**Tot. Persons**
Gortmakellis	14	-	-	95	8	-	-	43
Ballyknock	13	-	-	88	6	-	-	39
Clonmore	4	-	-	23	2	-	-	9
Monadreela	10	35	33	68	2	4	8	12
Boscabell	16	49	48	97	8	23	25	48
George's-Land	1	4	2	6	1	3	5	8
Kilscobin	2	3	5	8	2	2	3	5
Hughes'-Lot East	10	28	33	61	8	21	22	43*
Rathordan	27	102	92	194	18	58	58	116
Waller's-Lot	6	27	14	41	9	31	25	56*
Cooper's-Lot	7	14	18	32	5	15	18	33
Owen's & Bigg's-Lot	5	17	15	32	5	20	13	33
Windmill	20	57	61	118	8	26	16	42
Deerpark	2	6	8	14	1	4	4	8
Farranamanagh	47	160	159	319	34	92	83	175

Table x: Census Returns for 1841 & 1851. *indicates part included in Cashel Urban District (Dalton 1994, 167–8; Meskell 1987, 254–6)

Such comparative information allows the full impacts of the Famine to be realised at local level. These figures should be treated with caution, however, as Smyth (2012, 13) has recently illustrated the inaccuracies in the 1841 statistics. Townlands like Clonmore and Windmill saw a 50 % or more reduction in the number of houses over the 10 year period represented in the censuses. Monadreela lost eight of its 10 houses and suffered a drastic reduction in population (68 persons reduced to 12). This would have had enormous negative impacts on the locality, both socially and economically. In Monadreela, the remains of the dwelling discovered on Site 14 may represent one of these mud-walled houses abandoned during the Famine.

Primary Valuation of Tenements in St. Patrick's Rock & St. John Baptist Parishes

In the Primary Valuation of Tenements recorded in Griffith's Valuation for South Tipperary taken in August 1850 the following information is of relevance for those townlands investigated on the bypass.

Townland	Acres (roods & perches)	Land £	Buildings £	Total £
Gortmakellis	357 (1 r. 18 p.)	£302 16s	£15 8s	£318 4s
Ballyknock	250 & 27 perches	£200 3s	£10 7s	£210 10s
Clonmore	65 & 15 perches	£47 18s	£4 11s	£52 9s
Monadreela	20 & 38 perches	£68 13s	£2 3s	£70 16s
Boscabell	268 (1 r. 5 p.)	£165 3s	£10 1s	£175 4s
George's-Land	104 (2 r. 5 p.)	£70 8s	£1 2s	£71 10s
Kilscobin	117 (1 r. 16 p.)	£86 2s	£3 4s	£89 6s
Hughes'-Lot East	413 (9 p.)	£680 7s	£140 14s	£821 1s
Rathordan	842 (3 r. & 4 p.)	£848 11s	£37 5s	£885 16s
Waller's-Lot	153	£314 13s	£24 16s	£339 9s
Cooper's-Lot	199 (1 r. 20 p.)	£245 4s	£8 19s	£254 3s
Owen's & Bigg's-Lot	143 & 27 perches	£148 10s	£3 19s	£152 9s
Windmill	299 (2 r. & 31 p.)	£382 15s	£11 5s	£394
Deerpark	152 (3 r. 9 p.)	£276 7s	£35 17s	£312 4s
Farranamanagh	655 (3 r. 10 p.)	£565 16s	£51 5s	£617 1s

Table xi: Extract from the Primary Valuation of Tenements in St. Patrick's Rock & St. John Baptist parishes recorded in the Griffith's Valuation, August 1850, listed per total value of land and buildings.

In Windmill Michael Foley occupied the fields that comprised sites 31–36i inclusive (Figure v). His total holding was 11 acres (1 rood & 7 perches) with no buildings and the value was £18, 7 shillings: the Immediate Lessor was the Court of Chancery. Elsewhere in Windmill thirteen tenants were listed as having houses in addition to land. Of particular interest a John Murray (the Immediate Lessor being the Court of Chancery) was listed with a house and garden of less than one acre (1 rood & 32 perches), valued at only 1 shilling and buildings at 11 shillings, with a cumulative value of 12 shillings; Thomas Carey (the Immediate Lessor being Charlotte Green) was listed with an office and land, 45 acres (9 perches) valued at £63, 3 shillings and buildings at 6 shillings, with a cumulative value of £63 9 shillings. Only two houses were vacant (the Immediate Lessor being Edmund Dunne) valued at 11 shillings and 17 shillings each. The total acreage for Windmill was 299 acres (2 roods & 31 perches), with land valued at £382, 15 shillings, buildings at £11, 5 shillings, giving a total value of £394.

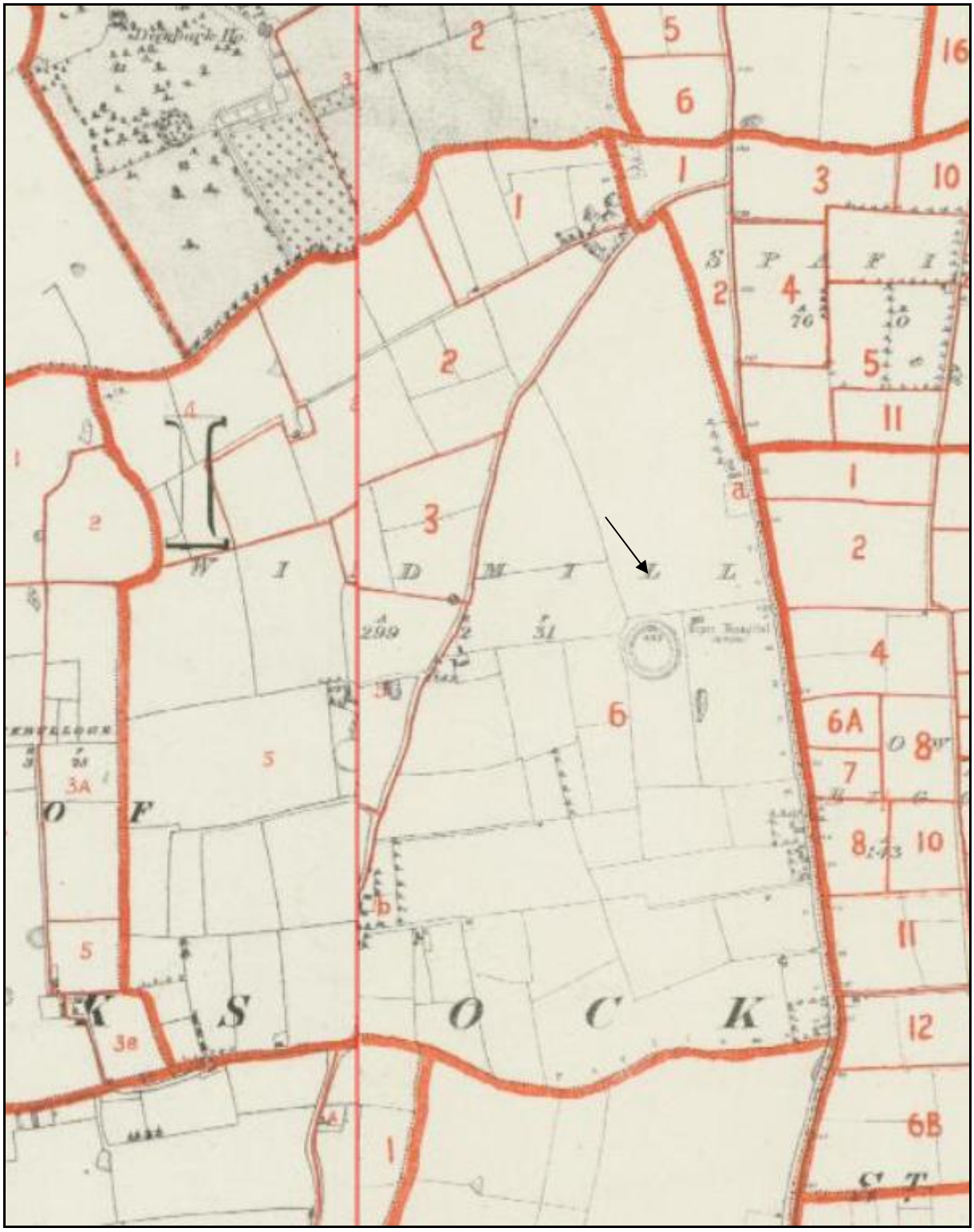

Figure v: Griffith's Valuation Map *c.* 1850, Site 35 indicated. Source: www.askaboutireland.ie

1st Edition OS 25-inch map

The Hospital is substantially denuded by the time of the 1st Edition OS 25-inch map with its western wall completely removed (Figure vi). In addition the southern wall survives to a lesser extent than the northern wall. The field boundary has been removed. Trees are depicted inside and on the banks of the enclosure for the first time while the 'trig. Point' has been moved outside and to

the south of the enclosure. The large field has now been divided into three smaller fields, with sites 31–35 located in a field 14.93 acres in extent. No features are depicted where the excavations were located.

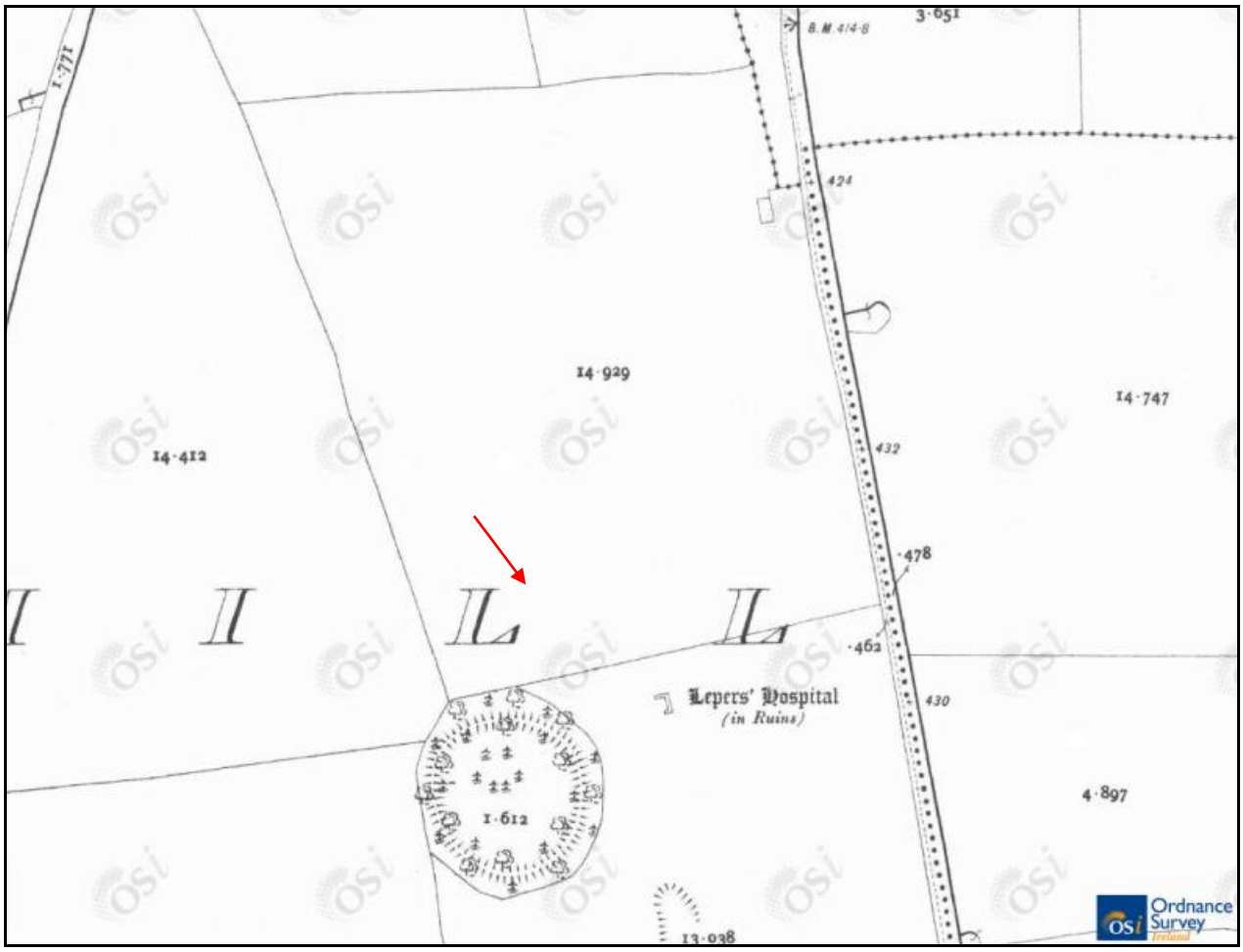

Figure vi: 1st Edition OS 25-inch map location of Site 35,1901–05. Source: www.osi.ie

2nd Edition OS six-inch map

On the 2nd Edition OS six-inch map 'Lepers' Hospital (*in Ruins*)' is marked by a small dot on the map to the northeast of the hilltop enclosure (Figure vii). The 'trig. Point' (height 475 feet) is indicated in the same location as previous, while to the south-east at the roadside another 'trig. Point' has a height of 425.2 feet. A number of trees are shown inside the hilltop enclosure.

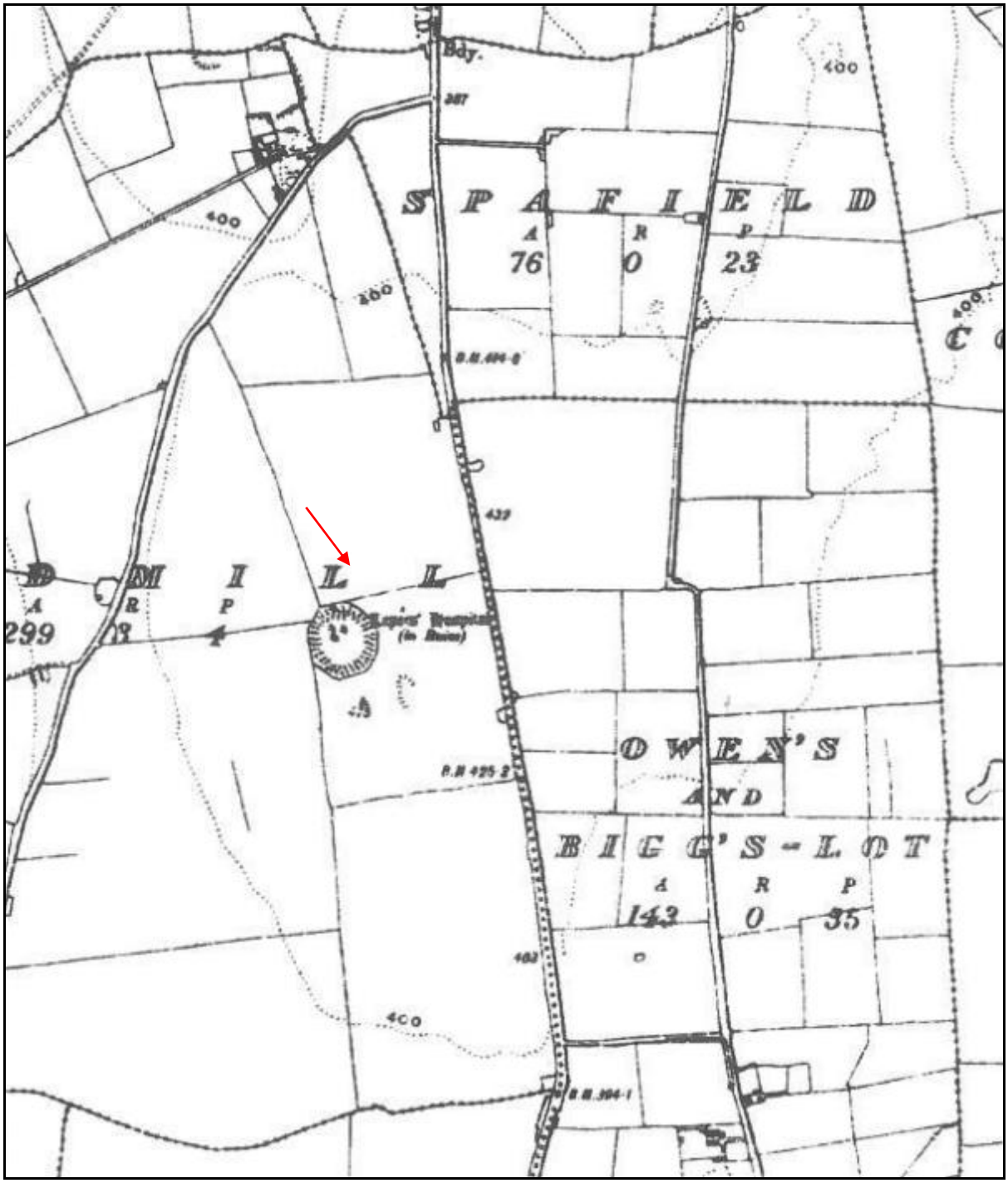

Figure vii: 2nd Edition OS six-inch map location of Site 35, published in 1906 (revised 1903, reprinted 1935)

3rd Edition OS six-inch map

On the 3rd Edition OS six-inch map 'Lepers Hospital (Site of) is marked with a '+' (Figure viii). Trees are indicated on the edge of the hilltop enclosure as well as the interior. The main changes occur along the Haig's Terrace road north of Site 36i and 36ii, where the terrace of houses has been built. The adjoining fields have been subdivided into smaller units. The field which encompassed sites 31–36i has been divided into one large field with two smaller units at the northern end, where

a roadside dwelling is now built. The former single triangular-shaped field which encompassed Site 36i has also been sub-divided into three fields with two new boundaries running east/west.

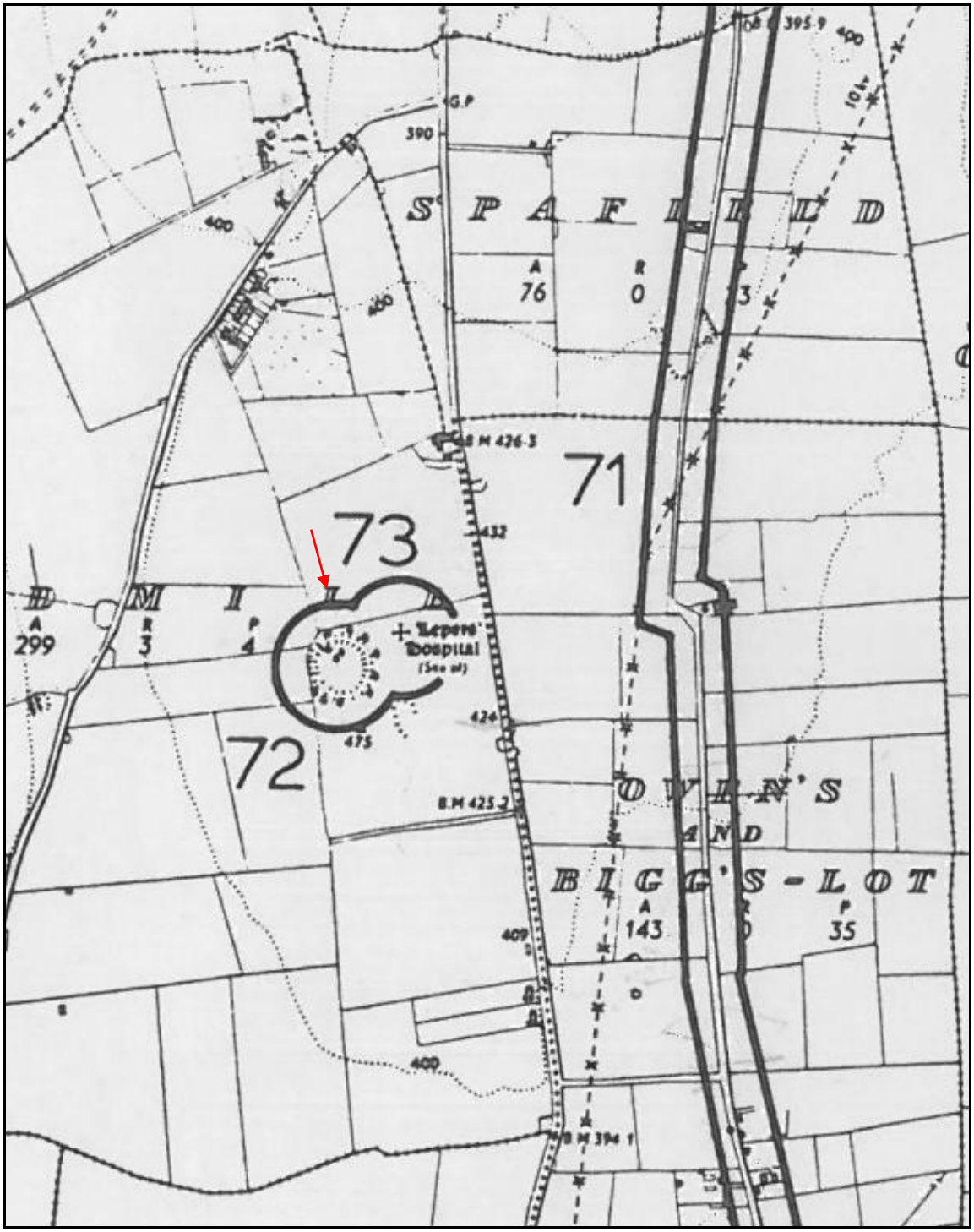

Figure viii: 3rd Edition OS six-inch map location of Site 35, published in 1954 (revised 1952 & 1954, reprinted 1954)

Local Information

Information from local Cashel historian Martin 'Bob' O'Dwyer relates that children (himself included) regularly played in the ruins of the leper hospital in the 1950s, after which the stones were dispersed and the site covered over. This is confirmed by the former landowner Paddy Meaney. Anecdotally, the children were afraid of cutting themselves for fear of catching the disease (O'Dwyer pers. comm.). The fields have been used for cattle grazing in the last few decades and there has been no ploughing in living memory.

Plate 1: Vertical aerial image of Windmill townland taken in 1994; N to left. The curving stone wall at left is the southern townland boundary edge with Deerpark / Farranamanagh. This is also the parish boundary between St. Patrick's Rock and Hore Abbey parishes (source: South Tipperary County Council).

Plate 2: Vertical aerial image of Windmill townland at lower right, taken in 2000; N to left (source: Kilkenny County Council)

EXCAVATION *(Figures ix–x, 3–5, Plates 3–50)*

The sequence of investigations in Windmill was informed by the results of the Phase 1 archaeological test excavations (Lennon 2002). It was decided in consultation with South Tipperary County Council that the areas be sub-divided for either further testing (sites 31 & 36) or fixed price resolution works (sites 32, 33, 34, 35 & 37). The aim of the stripping and resolution of Site 35 was the investigation of the features found during testing in Phase 1 and to discover if any other archaeological features were present. The area designated for stripping and resolution measured 3,328 m². A 360º mechanical excavator with toothless bucket stripped the topsoil down to the level of subsoil and the archaeological features, whichever was encountered first. The subsoil was subsequently cleaned by hand and the features investigated and recorded. The layout of the site was recorded using DGPS surveying equipment. The western boundary of the site was formed by an upstanding field boundary (still in existence) separating this site from Site 36i (licence 03E0746). A topographic survey of this ditch (55) and bank (56) was carried out prior to its removal. During excavation two modern animal burials were found dug into ditch (55) and not investigated further.

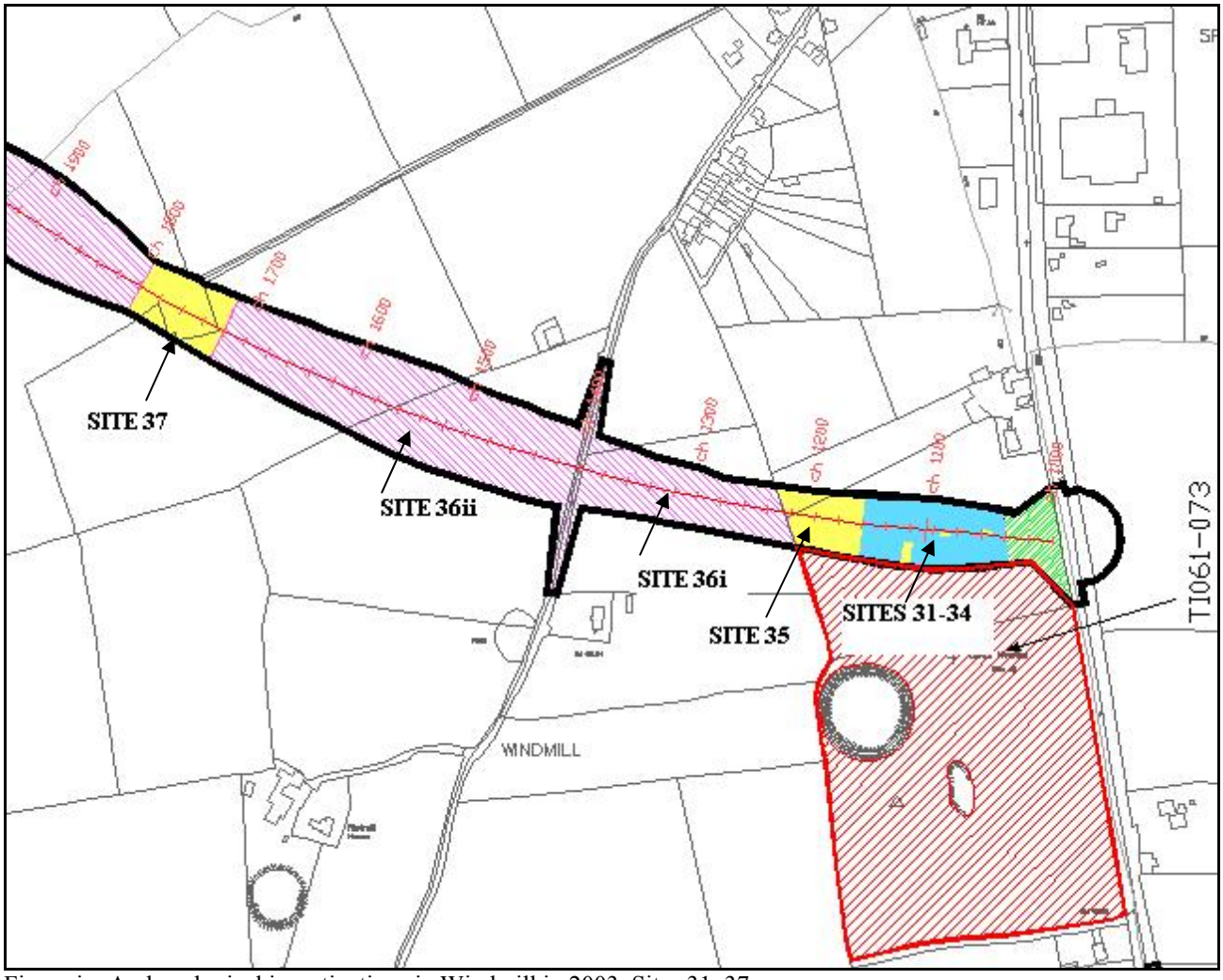

Figure ix: Archaeological investigations in Windmill in 2003, Sites 31–37

Of the features identified from the Phase 1 testing, only the field drain, was re-located in the northern part of the site, and assigned context [44]. Aside from the plough furrows and one isolated posthole [54] all the features were located toward the southern portion of the site, and it is highly likely associated features continued outside the CPO to the south (toward the Windmill hilltop fort). The majority of archaeological features on Site 35 comprised plough furrows and randomly distributed pits, postholes and stakeholes, with a concentration of features in the southwest and western parts of the site. A small number of human bones (six in total) were recovered during topsoil stripping in the eastern portion of the site: these were subsequently lost during JCNA post-excavation works. The ground level prior to excavation measured 136.13 m OD; the depth of excavation was measured at 131.23 m OD.

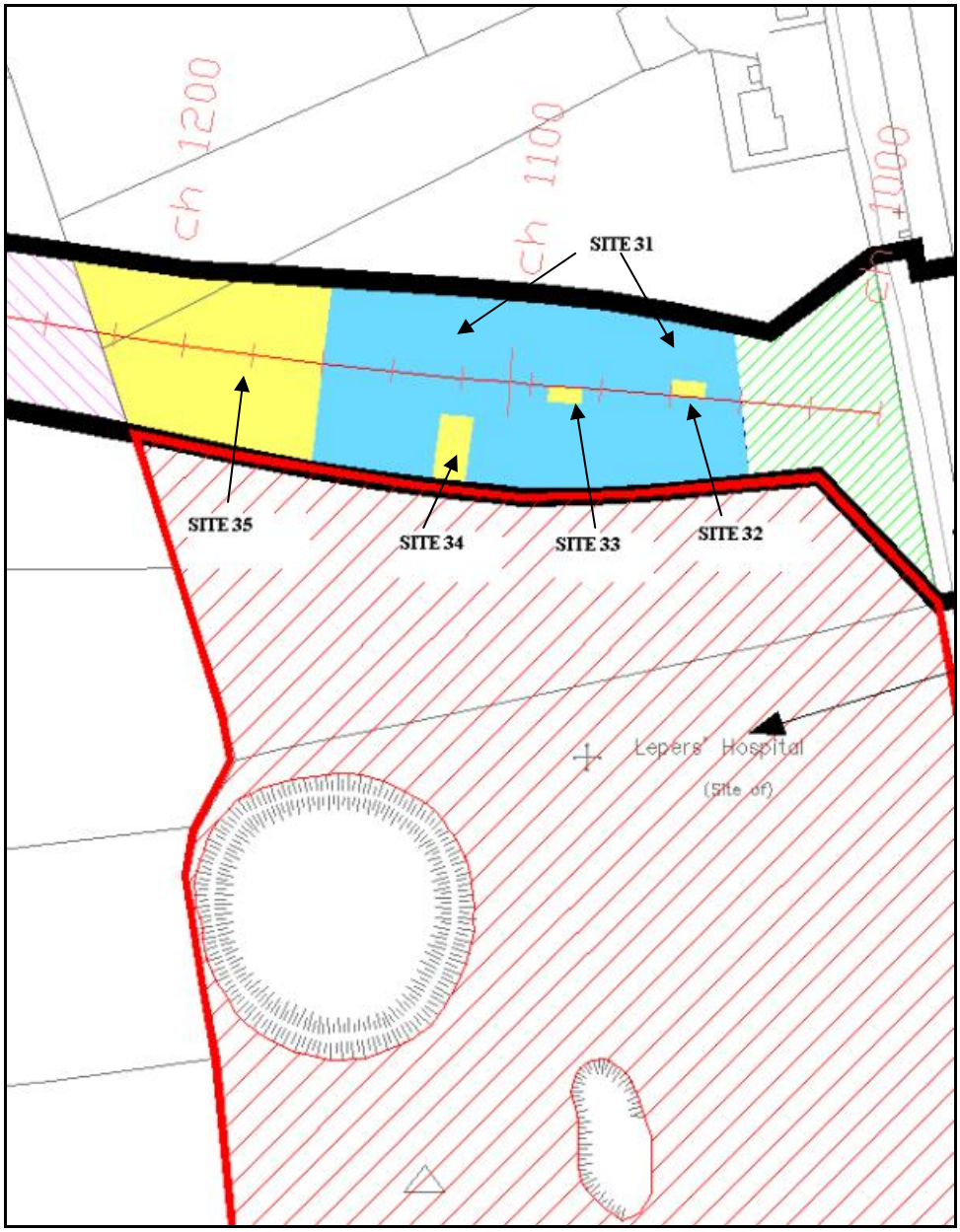

Figure x: Archaeological investigations in Windmill in 2003, Sites 31–35

Topsoil

The topsoil (01) consisted of grey-brown silty clay with an average depth of *c.* 0.20 m. Finds consisted of eight sherds of post medieval pottery, one iron nail and a copper alloy washer/cap (see Appendix 2).

Subsoil

The subsoil (02) was compact light orange silty clay found directly beneath topsoil (01).

Natural

Limestone gravel (09) was found beneath (02) and this gravel continued west into Site 36i where it was more fully exposed during excavation.

Plate 3: Northern portion of site, looking west

Plate 4: Southern portion of site, looking south-west

Prehistoric Features

Possible Early Neolithic Pit (Plates 5–7)

Pit [06] was located at the extreme south-eastern corner of the site *c.* 5 m east of the upstanding field boundary (55). Upon excavation the pit was found to be sub-oval shaped in plan with sharp break of slope, vertical sides and rounded base. It measured 0.32 m by 0.18 m and 0.14 m deep, and was filled with moderately compact, mid-pinkish brown silty clay with occasional charcoal and burnt clay inclusions (05). Oak (*Quercus sp.*) charcoal was identified from (05) and returned a radiocarbon date of 3763–3638 cal BC (UBA-13798). It is possible this charcoal was old at the time of its deposition. Pit [06] was an isolated feature as the nearest feature to it was the undated pit [08], located *c.* 4 m to the northeast near the edge of excavation (see Undated Features below). There was no stratigraphic link between both pits apart from both being subsoil-cut. Two plough furrows are recorded near the pits and it is most likely that any associated features were removed by the later ploughing activity.

Plate 5: Discovery of pit [06] prior to removal of ditch (55), scales 2 m

Plate 6: Pre-excavation of pit [06], scale 0.50 m

Plate 7: Mid-excavation of pit [06], scale 0.50 m

Early Bronze Age Features

One posthole, two small charcoal spreads (undated) and three pits were dated to varying stages of the Early Bronze Age period. These features should be seen as peripheral elements associated with the contemporary roundhouse and settlement excavated on Site 36i, *c.* 50 m to the west.

Posthole & charcoal spreads (Plates 8–9)

Located in the south central area of the site was a posthole and two small charcoal spreads. Around these features later ploughing was found to be very intensive. Posthole [32] was sub-circular in shape with sharp break of slope, steep sides sloping to a sharp, V-shaped base. It measured 0.40 m by 0.38 m and 0.44 m deep. The fill (31) was orange brown sandy silt with frequent charcoal and occasional small stone inclusions. Oak (*Quercus sp.*) charcoal identified from (31) was radiocarbon dated to 2469–2299 cal BC (UBA-13797).

Plate 8: Mid-excavation of posthole [32], scale 0.50 m

Plate 9: Post-excavation of posthole [32], scale 0.50 m

Possibly associated with this posthole due to their close spatial association were two thin charcoal spreads (33) and (35). There was no evidence of a cut into subsoil so the spreads either represented a discrete deposit or had been truncated by later ploughing. These spreads were located *c.* 0.25 m north of the posthole and may originally have formed a single spread of material.

Pits (Plates 10–15)

Pit [04] was located c. 20 m southeast of posthole [32] and was an irregular sub-circular feature which measured 0.44 m by 0.43 m and 0.08 m deep. It was filled by medium brown silty clay with a moderate amount of charcoal from which oak (*Quercus sp.*) charcoal was radiocarbon dated to 2204–2037 cal BC (UBA-13800). It was located *c.* 0.5 m west of the Early Neolithic pit [06].

Plate 10: Pre-excavation of pit [04], scale 0.50 m

Plate 11: Mid-excavation of pit [04], scale 0.50 m

Plate 12:Post-excavation of pit [04], scale 0.50 m

Pit [45] was a circular pit with concave sides and base, measuring 0.35 m in diameter and 0.15 m deep. It was filled by sandy silt with frequent charcoal and occasional small stones (46). Oak (*Quercus sp.*) charcoal identified from (46) was radiocarbon dated to 2134–1910 cal BC (UBA-13795). The location of pit [45] was not accurately recorded by JCNA during excavation.

Plate 13: Mid-excavation of pit [45], scale 0.50 m

Pit [16] was located near the south-eastern edge of the site, un-associated with any other features. The pit was sub-oval in plan with a sharp break of slope, vertical sides and flat base; measuring 0.69 m by 0.42 m and 0.18 m deep. The fill (15) was loose light brown clayey silt with occasional small stone and charcoal inclusions: these were concentrated in the upper portion of the fill. Pomaceous (*Pomoideae sp.*) charcoal from (15) was radiocarbon dated to 1893–1691 cal BC (UBA-13801), slightly later in date than pit [45], but contemporary with the Site 36i roundhouse (see Site 36i Final Report).

Plate 14: Mid-excavation of pit [16], scale 1 m

Plate 15: Post-excavation of pit [16], sca;e 1 m

Middle Bronze Age Features

One pit and two unrelated postholes were dated to varying stages of the Middle Bronze Age period: the pit and one of the postholes were contemporary, again an association with the Middle Bronze Age activity on the hillside as seen on sites 32, 33 and 34.

Posthole (Plates 16–18)

Posthole [54] was an isolated feature located at the northern end of the site. It was roughly circular in shape, with a sharp break of slope, vertical sides and uneven base; measuring 0.38 m by 0.37 m by 0.23 m deep. It was filled by loose mid-grey clayey silt containing moderate charcoal inclusions and occasional medium-sized stones (53). Hazel (*Corylus avellana*) charcoal identified from (53) returned a radiocarbon date of 1751–1616 cal BC (UBA-13794).

Plate 16: Pre-excavation of posthole [54], scale 0.50 m

Plate 17: Mid-excavation of posthole [54], scale 0.50 m

Plate 18: Post-excavation of posthole [54], scale 0.50 m

Pit (Plates 19–21)

Pit [38] was a circular pit with steep sides and a flat base; measuring c. 0.70 m in diameter and 0.32 m deep. It was filled by loose dark brown/black silty clay (37) containing frequent small and very large stones, both sandstones and limestones. The stones almost made up most of the pit deposit. The fill also contained twelve small pieces of unburnt bone that can be classified as fragments of long bone from a medium-sized animal such as sheep or pig (Appendix 7). These were the only stratified animal bones from the site (excluding modern bones). Pomaceous (*Pomoideae sp.*) charcoal identified from (37) was radiocarbon dated to 1393–1215 cal BC (UBA-13793).

Plate 19: Pre-excavation of pit [38] with *in situ* animal bone, scale 0.50 m

Plate 20: Mid-excavation of pit [38], scale 0.50 m

Plate 21: Post-excavation of pit [38], scale 1 m

Posthole (Plates 22–23)

Posthole [22] was located in the southern portion of the site, c. 10 m east from the Early Bronze Age dated posthole [32]. It was sub-circular shaped with a sharp break of slope, steep sides and flat base; measuring 0.35 m by 0.32 m and 0.16 m deep. It was filled with black clayey sand which contained 20–30 % charcoal inclusions (21). Pomaceous (*Pomoideae sp.*) charcoal identified from (21) was radiocarbon dated to 1370–1126 cal BC (UBA-13796). As posthole [22] was found un-associated with other features nothing more can be deduced about its function.

Plate 22: Mid-excavation of posthole [22], scale 0.50 m

Plate 23: Post-excavation of posthole [22], scale 0.50 m

Historic Feature

A single posthole was dated to the medieval period.

Posthole (Plates 24–25)

Posthole [24] was located in the south-eastern portion of the site close to the edge of Site 34. It was roughly circular in shape with a sharp break of slope, vertical sides sloping in towards a flat base, and measuring 0.23 m by 0.22 m and 0.10 m deep. It was filled with loose mid-brown clayey silt (23) with charcoal staining towards the top of the posthole. Hazel charcoal was identified from (23) and returned a radiocarbon date of cal AD 1217–1376 (UBA-13799). During the environmental analysis of the posthole fill one *Galium sp.* (bedstraw) seed was recorded from the entire site.

Plate 24: Mid-excavation of posthole [24], scale 0.50 m

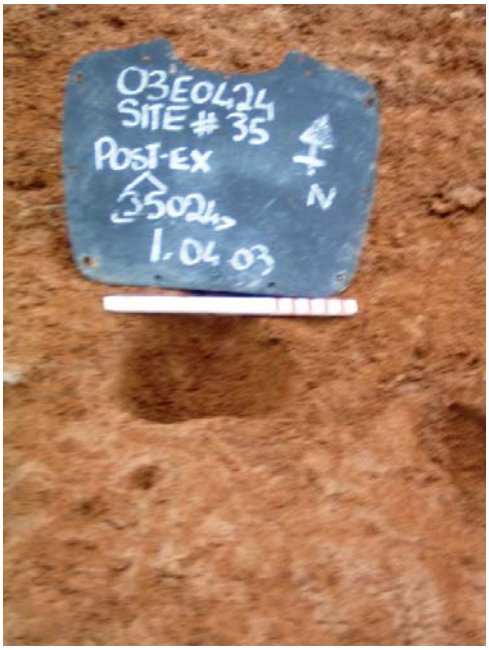

Plate 25: Post-excavation of posthole [24], scale 0.50 m

Post Medieval Features

Pits (Plates 26–29)

Pit [20] was only partially revealed as it extended outside the CPO at the southern baulk. It appeared to be oval in shape, measuring 0.86 m by 0.22 m and 0.03 m deep. It was filled by loose mid-greyish brown clayey silt (19), from which two oyster shells (not retained) and a piece of red brick (03E0424:13) was retrieved.

Plate 26: Pre-excavation of partially exposed pit [20], scale 1 m

Plate 27: Post-excavation of partially exposed pit [20], scale 2 m

Pit [52] was sub-circular measuring 0.6 m by 0.58 m by 0.13 m deep which was filled by brown clayey silt with occasional charcoal flecks (51). Two different pieces of post-medieval glass were found from the southern half of the fill: a shard of black glass (03E0424:2) and a shard of green bottle glass (03E0424:7).


Plate 28: Mid-excavation of pit [52], scale 1 m


Plate 29: Post-excavation of pit [52], scale 1 m

Undated Features

Pits (Plates 30–35)

Pit [08] was found at the south-eastern edge of the site where the boundary with Site 34 ran. The pit was circular in shape, with a sharp break of slope, steep/vertical sides and flat base. It measured 0.51 m by 0.50 m by 0.39 m deep and upon removal of the fill was found to contain two postholes

[48] and [50] in its base. Posthole [48] had a sharp break of slope, vertical/concave sides and uneven sloping base and measured 0.20 m by 0.17 m and 0.26 m deep. Posthole [50] had a sharp break of slope, vertical sides and flat base and measured 0.23 m by 0.20 m and 0.37 m deep. The three cuts were filled with loose mid-pinkish brown clayey sand which contained occasional small stones and charcoal flecks (07) and at the time of excavation were considered contemporary.

Plate 30: Pre-excavation of pit [08], scale 0.50 m

Plate 31: Mid-excavation of pit [08], scale 0.50 m

Plate 32: Post-excavation of pit [08] with *in situ* postholes [48] & [50], scales 0.50 m & 1 m

Pit [14] was identified beside posthole [42] on the eastern side of the upstanding field boundary (see next). It was a shallow oval pit measuring 0.50 m by 0.23 m by 0.08 m deep. It had a gentle break

of slope on all sides with a slightly U-shaped base and was filled by light brown loose silty clay with occasional stone inclusions (13).

Plate 33: Mid-excavation of pit [14], scale 0.50 m

Plate 34: Post-excavation of pit [14], scale 0.50 m

Located 40 m from this pit was pit [12] (the exact location of the pit was not established by the excavator). Pit [12] was a shallow oval pit measuring 0.51 m by 0.42 m by 0.06 m deep. The western side was of the pit was deeper, the eastern side more gradually sloped. It was filled with light brown silty clay with no inclusions (11).

Plate 35: Mid-excavation of pit [12], scale 0.50 m

Postholes (Plates 36–39)

Posthole [42] was located on the eastern side of the upstanding field boundary (56). It was sub-circular in shape measuring 0.30 m by 0.21 m by 0.23 m deep. It was filled by loose mid-brown clayey silt with 10 % small stone inclusions (41).

Plate 36: Mid-excavation of posthole [42], scale 0.50 m

Plate 37: Post-excavation of posthole [42] (error on board), scale 0.50 m

Posthole [18] was located c. 5 m north from the partially exposed pit post medieval pit [20]. It was circular in shape with steep sides and a flat base; measuring 0.52 m by 0.30 m by 0.27 m in depth. It was filled with loose mid-brown clayey silt with no inclusions (17). Both postholes produced no evidence of dating material and could not be linked to any other postholes.

Plate 38: Mid-excavation of posthole [18], scale 0.50 m

Plate 39: Post-excavation of posthole [18], scale 0.50 m

Field Boundary (Plates 40–45)

Prior to excavation an upstanding field boundary marked the western edge of the site, separating this field from the western field which slopes downward toward the Haig's Terrace road. This north south orientated boundary is still upstanding on either side of the CPO. Upon excavation a field gate through the boundary was removed, and the boundary was found to consist of a clay bank faced with stone facing intermittently along its length. There was evidence of plenty burrowing activity in the form of rabbits and there was low scrub growth with hawthorn and alder trees growing on the sides and top of the bank.

Plate 40: West facing section of field boundary bank (56), scales 2 m

Plate 41: West facing section of field boundary bank (56), scales 2 m

Plate 42: Animal burrowing into field boundary bank (56), scales 2 m

Plate 43: Former gate through field boundary bank (56), scales 2 m

The bank (56) was removed by machine under archaeological supervision and a ditch [55] was found on either side of the bank, cut into subsoil. Ditch [55] was investigated by machine by placing a number of test trenches across its length. There was a uniform sterile clay fill (49) within the ditch which came down onto the natural gravel (09) beneath.

Plate 44: Ditch [55] on the eastern side of the former field boundary

Plate 45: Close up of fill (49) in ditch [55]

Drains (Plates 46–49)

A number of stone-filled field drains were noted across the site. Drain [44] was northeast / southwest orientated with sharp break of slope, concave sides and flat/concave base and measured 15 m long, 1.1 m wide and 0.6 m deep. It was filled with alternating pockets of small sub-rounded stones and redeposited natural clay (43). Upon excavation the stones ran under the clay and formed what appeared to be a large machine-cut field drain, despite its short length. This would suggest the drains were a relatively recent addition to the agricultural history of the field.

Plate 46: Field drains in the southern part of the site

Plate 47: Field drains in the centre of the site

Plate 48: Field drains in the northern part of the site

Plate 49: Close up of stone-rich fill (43) in drain [44]), scale 1 m

Plough furrows

The plough furrows dominated the archaeological remains discovered on Site 35, with each having irregular concave sides and roughly flat bases which would indicate that they had been cut by hand. This method of cultivation was prevalent from the late 17th century onwards, which gives an approximate indication of date for these features. The furrows were exposed during the topsoil stripping of the site and then investigated by placing sections along their length. All furrows were orientated northeast / southwest following the downward slope of the hill from east to west.

Disarticulated Human Bones

During excavation it was reported to the Project Engineer and Project Archaeologist that six human bones, including a skull fragment, foot bone and clavicle, were recovered mixed in the natural, having been found during topsoil stripping. Following instruction from the Project Archaeologist careful cleaning of the surrounding area did not reveal any further bones or a grave cut (Figure 4). It is likely that ploughing, shown by the numerous plough furrows on the site had disturbed a grave and that there were now no other visible archaeological remains present. The bones were collected and recorded by JCNA and the Gardaí and the National Museum of Ireland (NMI) were informed by JCNA. The site director confirmed that the Gardaí in turn contacted the local Coroner. The site director confirmed the Coroner requested that the bones be taken by the Gardaí and sent to him, the Coroner, for analysis. Later correspondence from the Coroner confirmed he had never received the bones. Their exact whereabouts are therefore unknown. This is most unfortunate as the bones may well have been human remains associated with the nearby Leper Hospital in the adjoining field to the south.

Modern Animal Burials (Plate 50)

Two animal burials were exposed when the field boundary ditch [55] was being investigated. Both pits were located on the eastern side of the boundary and one pit produced a collection of 43 sheep/goat bones representing a single juvenile individual. The bones are large and complete and seem to represent the relatively recent burial of an animal that died from natural causes (Appendix 7). Partial investigation proved it was another modern animal burial.

Plate 50: Modern animal burial in ditch [55]), scale 2 m

DISCUSSION

Excavations on the N8 Cashel Bypass & N74 Link Road scheme produced a number of sites which contained archaeological features contemporaneous with those features discovered on Site 35. Cumulatively, the evidence suggests widespread human occupation around Cashel throughout prehistory with a preponderance of settlement reflected in all phases of the Bronze Age. Within the broad span that one calls the Bronze Age there has been an almost a continuous human presence (represented by the radiocarbon dates and artefactual evidence) identified from the excavations, in particular south and west of Cashel (Sites 30i–41), beginning at the Copper Age and continuing until the end of the Late Bronze Age. The low instances of archaeological features in townlands through which the Bypass traversed (Waller's-Lot / Cooper's-Lot, in particular) may be explained by these areas having been part of the '*Commons of Cashel*', and thereby being more intensively cultivated than in fields located outside these former municipal lands (see Tables i & ii above).

Plate 51: Modern view south-east to Windmill Hill from the N74 Link Road. Site 35 was at centre, left.

In Windmill townland the archaeology identified on Windmill Hill itself is represented by sites 31-36i (on the apex of the hill), sites 36i and 36ii (on the western slope of the hill and on low-lying ground to the west), and Site 30iii Owen's And Bigg's-Lot (on the eastern slope of the hill and on low-lying ground to the east – see Figures 3, ix & x). Both of these low-lying areas contain water sources in the form of ponds, an obvious attraction for settlement in an area where there is no river. Further west the Windmill / Deerpark hill is represented by sites 38 and 39 and this hillside is inter-visible with Windmill Hill itself, a key factor in any discussion of these sites. Only on the western side of the Windmill / Deerpark hillside are the archaeological features not inter-visible with Windmill Hill (at Site 41, Farranamanagh).

On Windmill Hill the division of the sites prior to excavation should be ignored in any discussion of the archaeology of the hill. An association with the recorded archaeological monuments on Windmill Hill (the Hilltop Enclosure TS061-072, the Leper Hospital TS061-073 and Moated Site TS061-167) should also be considered when discussing the archaeological findings from this site, and the more recent geophysical research surveys conducted here (Gimson 2012).

Early Neolithic

The excavation produced the earliest evidence of human occupation on Windmill Hill: an Early Neolithic pit [06] was found at the south-east corner of the site close to the edge of excavation. The single fill (05) showed evidence of dumped burning debris, with no *in situ* burning / scorching so it is likely this pit represented a rubbish pit. As oak (*Quercus sp.*) charcoal from the pit returned a radiocarbon date of 3763–3638 cal BC (UBA-13798) this would make the activity associated with this pit the earliest recorded archaeology on Windmill Hill: however, it is possible this charcoal was old at the time of its deposition. Pit [06] was an isolated feature as the nearest feature to it was the undated pit [08] (*c.* 3 m to the northeast), and the much later Early Bronze Age pit [04]. There was no stratigraphic link between pits [06] and [08], apart from both being subsoil-cut, although pit [08] had been dug to accommodate two postholes: clearly the feature was archaeological but the lack of dating material makes further speculation unwarranted.

Nearby Early Neolithic dates were returned from Site 30iii (licence 03E1086) in Owen's and Bigg's-Lot, *c.* 500 to the southeast. To the north-east of Cashel Site 1i in Ballyknock (licence 03E0673) a number of features contained carinated bowl pottery; sites 7, 8, 9, 11 and 13 (licences 03E0300, 03E0379, 03E0345, 03E0346 & 03E0378) in Monadreela and Site 19 in Boscabell (licence 03E0426) also produced Early Neolithic activity in the form of dated material and / or carinated bowl pottery (see Tables i & ii above). Near Cahir 15 km to the south contemporary Early Neolithic sites were discovered both north and south of the River Suir at Caherabbey Lower, Caherabbey Upper and Ballyegan (McQuade *et al*. 2009, 15).

On Site 36ii (licence 03E0676) in the low-lying ground to the west of Windmill Hill oak (*Quercus sp.*) charcoal from the fill of a stakehole was dated to 3500–3103 cal BC (UBA-13953). Broadly contemporary dates were returned from postholes and pits found near Cahir at Suttonrath, and on two excavations in the townland of Loughfeedora, due south of Windmill Hill (McQuade *et al*. 2009, 15). Clearly the single dated pit on Site 35 should be considered a fortuitous remnant of a much wider Neolithic landscape around Cashel, perhaps with a foci being on the River Suir.

Early Bronze Age

Four features, a posthole and three pits were dated to varying stages of the Early Bronze Age period spanning an 800 year period between 2400–1600 BC. There are direct links between some of these features and the roundhouse excavated on Site 36i.

Posthole [32] was located beside two undated small charcoal spreads. Oak (*Quercus sp.*) charcoal from the fill was radiocarbon dated to 2469–2299 cal BC (UBA-13797). It is possible the charcoal spreads were associated with the posthole but no stratigraphic link could be made. Two pits were broadly contemporary: pit [04] c. 25 m to the southeast contained oak (*Quercus sp.*) charcoal radiocarbon dated to 2204–2037 cal BC (UBA-13800). Pit [45] c. 23 m to the west was radiocarbon dated to 2134–1910 cal BC (UBA-13795). On nearby Site 34 contemporary activity was recorded from two pits: spindle (*Evonymus europaeus*) charcoal from the fill of burnt pit [08] was dated to 2048–1941 cal BC (UBA-13788). Within this fill a decorated rim sherd of vase food vessel pottery (03E0418:01) was found, the only example of this pottery-type from the Cashel Bypass excavations. Although generally associated with burials there was no direct evidence of cremations found on Windmill Hill, although cremated human bones and Beaker pottery were found together in a pit to the west on Site 36ii (licence 03E0676), and dated by elm (*Ulmus* sp.) charcoal to 2834–2480 cal BC (UBA-14337). Another pit on Site 34, [04] contained much burnt animal bone, a flint end scraper (licence 03E0418:04) and a pottery assemblage consisting of a small rim sherd, three fragments and 13 crumbs of Beaker pottery. Oak (*Quercus sp.*) charcoal from the fill of this pit returned a radiocarbon date of 2013–1828 cal BC (UBA-13786). Pomaceous (*Pomoideae sp.*) charcoal from the fill of pit [16] on Site 35 was radiocarbon dated to 1893–1691 BC (UBA-13801).

Therefore the features identified on Site 35 are clearly contemporary with the two pits identified on Site 34, and the recovery of Beaker pottery, presumably locally made, from features spanning almost 800 years reflects the widespread occupation of this part of Cashel in the Early Bronze Age. This activity appeared to have its' focus at the roundhouse and pits excavated on nearby Site 36i: hazel (*Corylus avellana*) charcoal analysed from one of the structural postholes of the roundhouse was radiocarbon dated to 1909–1756 cal BC (UBA-13792). There is then continuous Early Bronze Age settlement activity occurring on Windmill Hill (see Table ii above). Contemporary Early Bronze Age settlement sites were again identified around the River Suir (Caherabbey Upper, Ballydrehid, Ballyegan and Cloghabreedy near Cahir, and at Dogstown only 5 km south from Cashel (McQuade *et al*. 2009, 28). To the northeast of Cashel a number of Early Bronze Age sites were discovered on the M8 Cullahill to Cashel Road Project, the nearest being two sites in Borris townland (Conboy & Green 2009; Conboy, Hardy, Stevens & Green 2010).

Middle Bronze Age

Three features, two postholes and a pit were dated to varying stages of the Middle Bronze Age period spanning 500 years between 1600–1100 BC. As neither posthole was contemporary nothing can be deduced about the type of structure, if any, may have been located here as the posts may have been single markers. Posthole [54] was an isolated feature located at the northern end of the site and was radiocarbon dated to 1751–1616 cal BC (UBA-13794). Although isolated relative to the other features on the site this posthole was located c. 50 m southeast from pit [73] on Site 36i (licence 03E0675), where hazel (*Corylus avellana*) charcoal was radiocarbon dated to 1768–1637 cal BC (UBA-13789). A single posthole [06] identified on Site 34 *c.* 40 m to the east produced alder (*Alnus glutinous*) / hazel (*Corylus avellana*) which was radiocarbon dated to 1526–1397 cal BC (UBA-13787). This dated activity falls within the span of a number of the Site 35 features, so again, an intimate association between both sites is clear, although the disparate nature of the postholes is acknowledged.

Two features were found to be clearly contemporary on Site 35 although they were located c. 30 m apart: pit [38] and posthole [22]. The fill of pit [38] contained 12 small fragments of long bone from a medium-sized animal such as sheep or pig (Appendix 7). These bones are very significant as they represent the earliest faunal remains from Cashel that were not subject to burning - pomaceous (*Pomoideae sp*.) charcoal from this fill was dated to 1393–1215 cal BC (UBA-13793). As the pit was largely filled with stones more so than clay is it possible that the pit was an actual animal burial, with only a portion of the animal interred? Two features located c. 7 m to the south, pit [14] and posthole [42], did not provide any evidence to link with the activity from pit [38]. An isolated posthole [22] in the southern portion of the site was radiocarbon dated to 1370–1126 cal BC (UBA-13796). Combined, the evidence from both features suggests domestic settlement activity on this part of Windmill Hill toward the end of the Middle Bronze Age period. The survival of the animal bones is also important as only burnt bones comprised the faunal assemblage from those 16 Bronze Age sites discovered on the M8 Cashel to Mitchelstown Motorway Scheme excavations (McQuade 2009, 276).

In the surrounding Cashel landscape therefore contemporary activity was found on sites 30iii, 32, 33, 34, 36i, 36ii, 38 and on some of the other excavations 3 km to the east (see Tables i & ii, & individual Final Reports). The Middle Bronze Age period around Windmill Hill and Cashel was clearly one of intensively settled communities. This intensity of activity was further reinforced by the discovery of rock art on the inverted capstone of a cremation burial on Site 30iii (licence 03E1086). Charcoal from this burial was identified as cherry-type and radiocarbon dated to 1607–

1436 BC (UBA-13926); the stone bearing the rock art was presumably older (O'Sullivan & O'Connor 2009, 17–19), as the cemetery had its' genesis in the Early Bronze Age (see above). On the low-lying ground to the east and west of Windmill Hill the Middle Bronze Age evidence also consisted of pitting, with pryolithic activities and further cremation pit burials represented; the cremation evidence on Site 36ii was dispersed and less formally organised than on Site 30iii.

Turning to the environmental picture from Site 35 the analysis of the plant remains and wood charcoal from pits (04, 06, 16, 38 and 45) and postholes (22, 24, 32 and 54) provided the opportunity to highlight and interpret the archaeobotanical material recorded. No botanical remains indicative of arable agriculture or domestic activity: the presence of oak, pomaceous woods and hazel charcoal from many of the postholes may represent the remains of structural wood at the site, although the evidence was too disparate to suggest what form or type of structure may have been present. The high oak charcoal from pits (04, 06 and 45) may represent specific burning activities. Oak, hazel and ash would have been common to the opened woodland, while pomaceous woods would have grown on the woodland margins or in scrubby clearances (Appendix 6). Significantly, the alder ladder discovered dumped amongst a burnt stone deposit beside the pond on Site 30iii (licence 03E1086) was radiocarbon dated to 1390–1120 cal BC (Beta-247753).

On the low-lying ground to the east and west of Windmill Hill the Middle Bronze Age evidence also consisted of pitting, with pryolithic activities and cremation pit burials represented. This burial activity was found to be dispersed on Site 36ii but had been more formally organised on Site 30iii, where over twenty cremation burials were found together, directly facing south-east to the rising sun over Slievenamon (see Site 30iii Final Report).

Middle Bronze Age settlement sites were identified around the River Suir (Caherabbey Upper, Ballydrehid, Ballyegan and Cloghabreedy near Cahir, and nearer to Cashel at Dogstown and Shanballyduff (McQuade *et al*. 2009, 28). A number of Middle Bronze Age burial sites were also identified between New Inn and Cashel, within 8 km of Windmill Hill at Templenoe, Racecourse Demesne and Marlhill (McQuade *et al*. 2009, 123). To the northeast of Cashel a significant number of Middle Bronze Age sites were discovered on the M8 Cullahill to Cashel Road Project (see Recent NRA Excavations Around Cashel section above), the nearest being a site in Parkstown townland (McCullough, Breen, Hardy & Green 2010).

Medieval Period

An apparent hiatus in human activity ensued on this part of Windmill Hill and a single posthole was dated to the medieval period cal AD 1217–1376 (UBA-13799). Apart from one *Galium* sp.

(bedstraw) seed identified from this posthole [24], charcoal was the primary charred material recorded from the pits and postholes excavated at Site 35 (Appendix 6). Little can be deduced from this isolated posthole and it seems likely that associated features were ploughed out. The activity may be related to the nearby Leper Hospital (*site of*) TS061-073 or to the possible Moated Site TS061-160, both located to the southeast in the adjoining field. On Site 31 *c.* 100 to the east a body sherd of Cashel-type ware jug (03E0391:35) was found in topsoil, and dated to the mid-13th to early 14th centuries (Site 31 Final Report, Appendix 7). One broadly contemporary medieval site was also identified at Knockgraffon, 10 km south of Windmill Hill (McQuade *et al*. 2009, 181), and of course there was abundant contemporary evidence around Cashel itself at this time (see Table i & Historical Sources above). To the northeast of Cashel eight Medieval / Late Medieval sites were discovered on the M8 Cullahill to Cashel Road Project (see Recent NRA Excavations Around Cashel section above), the nearest being three sites in Moycarky townland (McCullough, Breen, Green & Stevens 2009; McCullough, Breen, Green & Stevens 2009a; McCullough, Breen, Stevens & Green 2009), and one site in Parkstown townland (McCullough, Breen, Hardy & Green 2010).

This apparent hiatus in activity of over 2,000 years should not be seen as absolute since Late Bronze Age and Iron Age dates and artefacts have been found both to the east and west of Windmill Hill (see Table ii above & Final Reports for sites 30iii & 38).

The discovery of the unstratified human bones (six in total) may be linked to the Leper Hospital (*site of*) TS061-073, although their location *c.* 200 m to the northwest may have been too far for a leper internment. It is also possible they were deposited from Cashel as ‘night soil’. However, these bones were lost by JCNA during post excavation works.

CONCLUSION

All excavation works have finished in association with the N8 Cashel Bypass & N74 Link Road. No further archaeological activity was identified on the site but it should be noted that the area investigated was small, and further activity may have been removed when the Windmill Hilltop Enclosure, the Leper Hospital and Moated Site were established. Due to its prominent topographical expression in the Cashel landscape it is unsurprising that Windmill Hill was a focus for human activity. It is significant the hill was inter-visible with the majority of the archaeological sites identified and excavated between Cashel and Cahir on the M8 Cashel to Mitchelstown Motorway Scheme. The earliest recorded archaeology on Site 35 was a seemingly isolated pit from the Early Neolithic period, and no clear function can be ascribed to it. During the Early Bronze Age the archaeology as revealed was associated with the nearby roundhouse and its' associated features on the western side of the hill. There appears to be uninterrupted activity on the hillside continuing into the Middle Bronze Age. Here, the evidence again suggested domestic activity in the form of pitting on the northern side of Windmill Hill. Contemporary Early Bronze Age and Middle Bronze Age burial activities on both sides of the hill provide the final link in a societal chain and reflect that throughout the Bronze Age, Windmill Hill was an important landmark for prehistoric settlers. This view is further reinforced by the very important lithic and pottery assemblages that have survived from nearby Site 34, although it is surprising that no such material derived from the Site 35 excavations. The hill would have acted as a key landmark north and east of the River Suir, a quick and safe route through which people had access to the fertile lands around Cashel.

There is a very high probability of archaeological features associated with sites 32–35 continuing southward and surviving between the N74 road and the Windmill hilltop enclosure TS061-072. This area was recently subject to geophysical investigation for research purposes (Gimson 2012, ii). The survey revealed a significant highly magnetic boundary detected to the north of the Windmill Hill enclosure; this contained a misalignment gap or entrance possibly leading to the enclosure. To the north is a ditched enclosure containing a visible entranceway, again facing the Windmill Hill enclosure, and a large number of possible pits (Figures 8 & 9). It is likely that some of these geophysical anomalies may be associated with the archaeology revealed on sites 32–35, in particular the pits. Therefore any proposed developments within this area should be subject to archaeological investigations prior to any development taking place.

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Appendix 1 Context Register

Context No.	Type	Description
(01)	Deposit	Topsoil. Grey brown silty clay with occasional stone inclusions of all sizes. Depth *c.* 0.20 m.
(02)	Deposit	Subsoil. Light orange/brown sandy clay.
(03)	Fill	Fill of pit [04]. Moderately compact medium brown silty clay. Moderate charcoal inclusions. Modern animal burial.
[04]	Cut	Cut of sub-circular pit with irregular sides and base. 0.30 m long, 0.25 m wide and 0.07 m deep. Filled with (03).
(05	Fill	Fill of pit [06]. Moderately compact medium pinkish brown silty clay. Occasional charcoal and burnt clay inclusions.
[06]	Cut	Cut of sub-oval pit with sharp break of slope, vertical sides and rounded base. 0.32 m long, 0.18 m wide and 0.14 m deep. Filled with (05).
(07)	Fill	Fill of pit [08] and postholes [48] and [50]. Mid-pinkish brown clayey sand. Occasional charcoal and small stone inclusions.
[08]	Cut	Cut of circular pit with sharp break of slope, steep/vertical sides and flat base. 0.51 m long, 0.50 m wide and 0.39 m deep. Filled with (07). Cut by (48) and (50), also filled with (07).
(09)	Deposit	Natural. Out-cropping of limestone gravel was found throughout the site, extending into Site 36i.
10		Cancelled
(11)	Fill	Fill of shallow pit [12]. Loose light brown silty clay.
12]	Cut	Cut of oval pit with gradual break of slope, sloping concave sides and rounded base. 0.51 m long, 0.42 m wide and 0.06 m deep. Filled with (11).
(13)	Fill	Fill of pit [14]. Loose light brown silty clay with occasional small stone inclusions.
[14]	Cut	Cut of oval pit with gradual break of slope, concave sides and rounded base. 0.50 m long, 0.23 m wide and 0.08 m deep. Filled with (13).
(15)	Fill	Fill of pit [16]. Loose light brown clayey silt with occasional small stone and charcoal inclusions.
[16]	Cut	Cut of sub-oval pit with sharp break of slope, vertical sides and flat base. 0.69 m long, 0.42 m wide and 0.18 m deep. Filled with (15).
(17)	Fill	Fill of posthole [18]. Loose mid-brown clayey silt with occasional small sub-angular stone inclusions. One smooth stone at one edge of the cut may have been utilised as a supporting stone, although this stone was not set within the fill.
[18]	Cut	Cut of circular posthole with sharp break of slope, vertical sides and flat base. 0.52 m long, 0.30 m wide and 0.27 m deep. Filled with (17).
(19)	Fill	Fill of shallow pit [20]. Loose mid-greyish brown clayey silt. Oyster shell (not retained).
[20]	Cut	Cut of shallow oval pit with imperceptible break of slope, gentle sides and flat base. Eastern half of pit lies under southern edge of excavation. 0.86 m long, 0.22

		m wide and 0.03 m deep. Filled with (19).
(21)	Fill	Fill of posthole [22]. Loose black clayey sand with frequent charcoal inclusions.
[22]	Cut	Cut of sub-circular posthole with sharp break of slope, steep sides and flat base. 0.35 m long, 0.32 m wide and 0.16 m deep. Filled with (21).
(23)	Fill	Fill of posthole [24]. Loose mid-brown clayey silt with moderate charcoal inclusions.
[24]	Cut	Cut of circular posthole with sharp break of slope, concave sides and flat base. 0.23 m long, 0.22 m wide and 0.10 m deep. Filled with (23).
25-30		Cancelled
(31)	Fill	Fill of posthole [32]. Orange brown sandy silt. Frequent charcoal and occasional small stones.
[32]	Cut	Cut of sub-circular posthole with sharp break of slope, steep sides and sloping base. 0.40 m long, 0.38 m wide and 0.44 m deep. Filled with (31).
(33)	Deposit	Thin charcoal-rich spread, may equate to (35)
34		Cancelled
(35)	Deposit	Thin charcoal-rich spread, may equate to (33)
36		Cancelled
(37)	Fill	Fill of pit [38]. Loose dark brown/black silty clay. Frequent small and large stones and animal bone.
[38]	Cut	Cut of circular pit with steep sides and flat base. 0.70 m in diameter and 0.32 m deep. Filled with (37).
39-40		Cancelled
(41)	Fill	Fill of posthole [42]. Loose mid-brown clayey silt. Occasional small sub-angular stones.
[42]	Cut	Cut of sub-circular posthole with sharp break of slope, vertical sides and flat base. 0.21 m long, 0.20 m wide and 0.23 m deep. Filled with (41).
(43)	Fill	Fill of field drain [44]. Alternating pockets of small sub–rounded stones and re-deposited natural clay, the stones densely packed together.
[44]	Cut	Cut of linear field drain with sharp break of slope, concave sides and flat/concave base. 15 m long, 1.10 m wide and 0.60 m deep. Filled with (43).
[45]	Cut	Cut of circular pit with concave sides and base. 0.35 m in diameter and 0.15 m deep. Filled with (46).
(46)	Fill	Fill of pit [45]. Sandy silt with frequent charcoal and occasional small stones.
47		Cancelled
[48]	Cut	Cut of circular posthole with sharp break of slope, vertical/concave sides and uneven sloping base. 0.20 m long, 0.17 m wide and 0.26 m deep. Filled with (07). Within pit [08].
(49)	Fill	Fill of field boundary ditch [55]. Appeared to consist of re-deposited clay laying directly on natural (09).

[50]	Cut	Cut of circular posthole with sharp break of slope, vertical sides and flat base. 0.23 m long, 0.20 m wide and 0.37 m deep. Filled with (07). Within pit [08].
(51)	Fill	Fill of pit [52]. Loose mid-brown clayey silt. Occasional charcoal and small stone inclusions.
[52]	Cut	Cut of sub-circular pit with sharp break of slope, vertical sides and uneven base. 0.60 m long, 0.58 m wide and 0.13 m deep. Filled with (51).
(53)	Fill	Fill of posthole [54]. Loose mid-grey clayey silt. Moderate charcoal and medium stone inclusions, including a number of decayed limestones.
[54]	Cut	Cut of circular posthole with sharp break of slope, vertical sides and uneven base. 0.38 m long, 0.37 m wide and 0.23 m deep. Filled with (53).
[55]	Cut	Field boundary ditch bordering Site 36i. Located on both sides of bank (56), filled by (49).
(56)	Deposit	Field boundary bank bordering Site 36i. Orientated north/south, comprising clay with stones intermittently along the length. Scrub growing on the sides and top, with plenty evidence for animal burrowing.

Appendix 2 Finds Register

Find No.	Context No.	Description
03E0424:01	(01)	Post-medieval pottery. Body sherd of Black glazed ware jar
03E0424:02	(51)	Fragment of black glass bottle
03E0424:03	(01)	Post-medieval pottery. Body sherd of Glazed red earthenware bowl
03E0424:04	(01)	Post-medieval pottery. Body sherd of Glazed red earthenware bowl
03E0424:05	(01)	Post-medieval pottery. Body sherd of Black glazed ware jar
03E0424:06	(01)	Post-medieval pottery. Body sherd of Glazed red earthenware bowl
03E0424:07	(51)	Fragment of green glass bottle
03E0424:08	(01)	Iron nail
03E0424:09	(01)	Post-medieval pottery. Rim/base of Shell-edged ware plate
03E0424:10	(01)	Post-medieval pottery. Rim/base sherd of Shell-edged ware plate
03E0424:11	(01)	Copper alloy washer/cap
03E0424:12	(01)	Post-medieval pottery. Glazed red earthenware bowl
03E0424:13	(19)	Red brick fragment

Appendix 3 Drawing Register

Sheet No.	Scale	Description
1	1:10	South facing section of [42]
1	1:10	South facing section of [16]
1	1:10	North west facing section of [12]
1	1:10	South facing section of [52]
1	1:10	East facing section of [14]
1	1:10	West facing section of [24]
1	1:10	South west facing section of [06]
1	1:10	Profile of [18]
1	1:10	North west facing section of [08]
1	1:10	South west facing section of [54]
1	1:10	East facing profile of [08], [48] & [50]
2	1:10	North facing section of [04]
2	1:10	East facing section of [38]
2	1:10	West facing section of [22]
2	1:10	West facing section of [44]

Appendix 4 Sample Register

Sample Number	Context Number	Description
1	(05)	Fill of pit [06].
2	(03)	Charcoal-rich fill of pit [04].
3	(31)	Fill of posthole [32].
4	(15)	Fill of pit [16].
5	(46)	Fill of pit [45].
6	(37)	Fill of pit [38].
7	(23)	Fill of posthole [24].
8	(21)	Fill of posthole [22].
9	(53)	Fill of posthole [54].
10	(37)	Animal bone from [38].
11	(01)	Animal bone from [01].
12	(03)	Animal bone from [03].

Appendix 5 Photography Register

There were 107 digital images recorded and these have been retained in the archives. There are 36 digital images recorded of both sides of the upstanding field boundary (56) prior to its archaeological removal.

Appendix 6 Environmental Report

Scheme – N8 Cashel Bypass & N74 Link Road

Site Name- Site 35 Windmill

Excavation number –03E0424

County – Tipperary

Job code – ENV/083

Author- Susan Lyons

Date – 12/06/10

Plant Macrofossil Remains & Charcoal Report

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Table 2 Charcoal Identifications from Site 35, Windmill (03E0424)

1 INTRODUCTION

This report discusses the plant macrofossil remains and charcoal remains recorded from the soil samples associated with the archaeological excavations at Site 35, Windmill (03E0424). While the carbonized plant remains and the charcoal are both constituted as environmental remains, they represent the results of two separate human activities. The remains of charred/waterlogged cereal remains and wild taxa can suggest evidence for arable farming and the selection of crops and plants brought to the site. The wood charcoal material on the other hand is characteristic of the wood species selected as a fuel resource and can go some way to understanding the local woodland environment.

The primary objective of the plant remains and charcoal project is to identify, analyse and interpret the botanical remains present in order a) highlighting the function of certain areas of the site or indeed the features recorded within and b) to help with understanding the change in the floral environment and activities at the site over time.

This report will later form part of an overall scheme-wide synthesis of environmental archaeological remains from the excavations along the N8 Cashel Bypass and N74 Link Road (Lyons, *forthcoming)*.

2 BACKGROUND

Site 35 was excavated as part of the archaeological mitigation programme associated with the N8 Cashel Bypass and the N74 Link Road under archaeological excavation licence number 03E0424. The majority of features on Site 35 were composed of randomly distributed pits, postholes and stakeholes, none of which contained any datable finds and only a few of which contained archaeological material. A small number of human bones were recovered from the subsoil in the eastern portion of the site, however a clean-up of the area did not reveal any further bones or a grave cut (Fairburn, 2009).

Nine flot samples from pit **(C38),** pits **(C4, C6, C16 and C45)** and postholes **(C22, C24, C32** and **C54)** were analysed for plant macrofossils and charcoal remains.

3 METHODOLOGY

3.1 Plant remains

The samples were [1]processed by Eachtra Archaeological Projects Ltd (Eachtra Archaeological Projects Ltd, 2009).

3.1.1 Sample processing (after Eachtra Archaeological Projects Ltd)

The processing technique employed for bulk dry soil samples is one of floatation. This is where each sample is soaked in water and agitated by hand to loosen any charred remains from the soil particles which allows for this material to be separated and float to the surface. This floating material (flot) is poured off and trapped in a sieve (mesh size 250 µm) and, once dried, scanned for plant remains using a binocular microscope. The larger residual material left behind (retent) is washed through a 1mm, 2mm and 5mm mesh or sieve and air-dried. Once dry, each retent is sorted by eye and any material of archaeological significance removed.

3.1.2 Quantification and identification of plant remains

The flot samples are viewed under a low powered binocular microscope (magnification x0.8 to x5). Where preservation allowed, all charred remains recovered were identified to species level where applicable and the constituents quantified numerically. Those plant remains which were abraded or fragmented were recorded using an abundance key to highlight the concentrations of material identified from each sample:

+ = rare (1-10), ++ = occasional (11-50), +++ = common (51-100) and ++++ = abundant (>100)

Plant species are made using reference to the author's seed collection and standard seed atlases and references; *Flora of the British Isles* (Clapham, A R, Tutin, T G, Warburg, E F, 1957), *Zadenatlas der Nederlandsche Flora* (Beijerinck, W.1976), *New Flora of the British Isles 2nd Edition* (Stace, C, 1997) and *Digital Seed Atlas of the Netherlands* (Cappers, R.T.J., R.M. Bekker and J.E.A. Jans, 2006).

3.2 Charcoal

3.2.1 Quantification of charcoal remains

[1] Soil samples are processed according to the standards and guidelines outlined in the Institute of Archaeologists of Ireland (IAI) 'Environmental Sampling Guidelines for Archaeologists', (IAI, 2006) and

Palaeoethnobotany: Handbook of Procedures. 2nd edition, San Diego: Academic Press (Pearsall, D 2000)

Quantifying charcoal samples can be difficult as many wood species can be affected by heat in different ways and hence become fragmented into an arbitrary number of fragments. Due to the potential for a very high number of charcoal fragments from the samples, a representative sample of 50 charcoal fragments (Keepax, 1988) are randomly chosen from larger samples for identification and analysis. In the case of smaller samples all charcoal fragments within are identified. The charcoal fragments of each species identified are counted, weighted (grams) and bagged according to species.

3.2.2 Identification of charcoal remains

Wood charcoal identifications were undertaken in accordance with Section 25 of the National Monuments Act, 1930, as amended by Section 20 of the National Monuments Amendment Act 1994, to alter an archaeological object.

The flot remains were sieved through a bank of sieves (2mm, 1mm and 0.5mm) to separate the larger charcoal samples from the much smaller charcoal fibres, which would prove more difficult to identify.

The larger sized charcoal fragments (>3mm in width) were fractured to view the three planes [transverse, radial and tangential sections] necessary for microscopic wood identification. The wood species identifications were conducted under a binocular microscope using incident light and viewed at magnifications of 100x, 200x and 400x where applicable. Where applicable the number of growth rings and the curvature of the rings are also noted, which can help with determining if the material is from trunk wood or smaller branches/twigs.

Wood species identifications are made using wood reference slides and wood keys devised by Franklin and Brazier (1961), Schweingruber (1978), Hather (2000) and the International Association of Wood Anatomists (IAWA) wood identification manuals and (www.lib.ncsu/edu/insidewood) by Wheeler, Bass and Gasson (1989).

4 RESULTS

The plant remains recorded from Site 35 are presented in **Table 1.**

The results of the charcoal identifications are presented in **Table 2.**

Carbonized wild taxa **–** Just one *Galium* sp. (bedstraw) seed was recorded from posthole **C24.**

Charcoal – Fragmented charcoal was recovered in low to high concentrations from all samples, with the exception of **C53**, which contained just stones. The Maloideae/Pomoideae spp charcoal recorded from posthole **C16** was submitted for C14 dating.

Three species totalling 223 identifications were recorded from the site. Oak (*Quercus* sp.) dominated the assemblage, followed by pomaceous woods (Maloideae/Pomoideae spp.) and with much lesser hazel (*Corylus avellana*) and ash (*Fraxinus excelsior*) **(Fig. 1)**

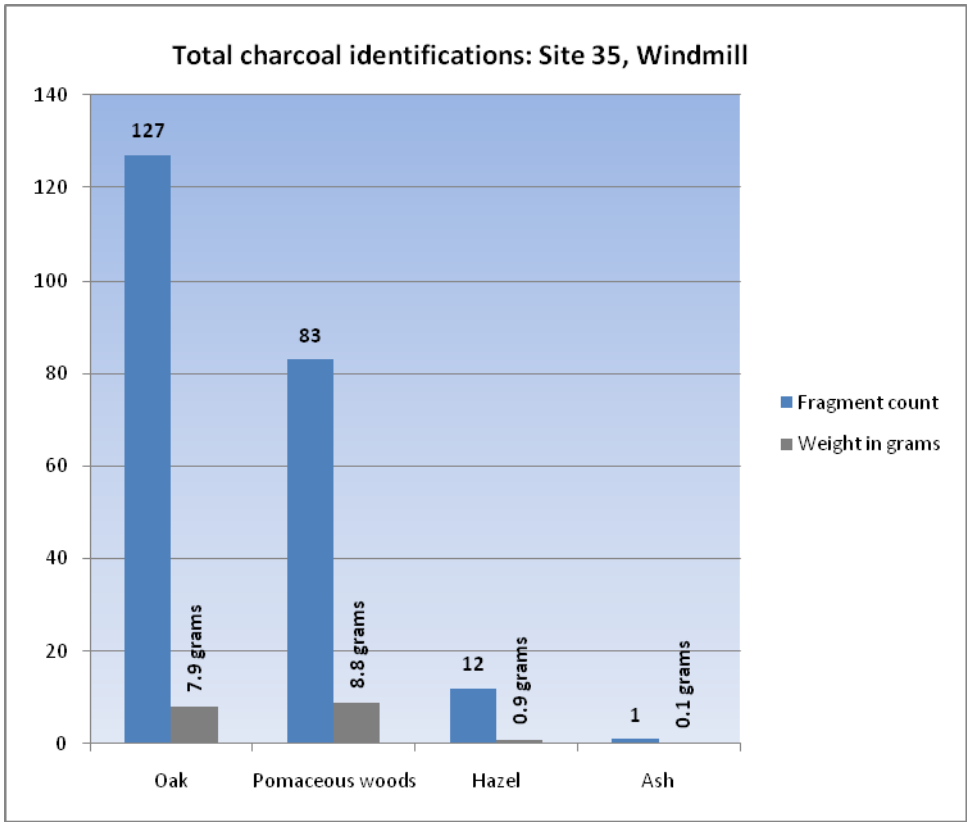

Fig. 1

5 DISCUSSION

5.1 Background and origin of wood species

Quercus sp. (oak)

Oak is a tall deciduous woodland tree, often growing in association with hazel and ash. Most species prefer damp, non-calcareous soils on lowland or montane sites. Of the 27 European species, pedunculate oak (*Quercus robur)* and sessile oak (*Quercus petraea)* are native to Ireland. Pedunculate oak is common on heavy clay lowland

soils whereas sessile oak thrives on the lighter loams characteristic of higher ground (Culter & Gale, 2000). The wood is easy to cleave both radially and tangentially and has provided one of the most important building materials since the prehistoric period (Gale & Culter, 2000). The heartwood timber is renowned for its durability but the paler sapwood is susceptible to beetle and fungal attack. The strength of the timber depends on the species and is influenced by climatic and edaphic factors (Edlin, 1951). When burnt, oak charcoal, particularly the dense heartwood, has higher calorific values than most European woods and this can make for good long-lasting fuel (Culter & Gale, 2000).

***Maloideae/Pomoideae* spp. (pomaceous woods)**

The pomaceous wood species includes the genera *Malus* (apple), *Pyrus* (pear), *Sorbus* (rowan/mountain ash or whitebeam) and *Crataegus* (hawthorn). They are anatomically very similar and in the absence of bark, buds and leaves cannot be differentiated between each other very often. The pomaceous wood types, which accounted for 11% of the charcoal assemblage from the site, are small deciduous spiny trees or shrubs and are common to the scrubby margins of woodlands and hedgerows (Gale & Culter, 2000). Hawthorn is shade-tolerant and forms understorey in ash and hazel woodland. Both hawthorn and apple-type (*Malus* sp.) produced edible fruits which would have been gathered as a foodstuff during the prehistoric period (Greig, 1991). These wood types burn slow and steady and provide excellent heat with minimal smoke (Culter & Gale, 2000). In later prehistoric periods, these wood species are more prevalent in the landscape, perhaps as a result of opening up larger areas of land or the fencing off of certain areas (Stuijts, 2003/4, 20).

***Corylus avellana* (hazel)**

Hazel woodlands replaced birch in the early post-glacial forests and remains on some shallow limestone soils to the present day (Pilcher & Hall, 2001). The species can tolerate most soil types, but not waterlogged conditions and forms a small deciduous tree or shrub. It commonly occurs in understorey of oak and/or ash woodlands, where it may grow to a height of 10m or more. In open areas or woodland glades hazel grows as a shrub. Hazel is a common species recorded from Irish archaeological sites and its widespread presence is highlighted in pollen diagrams from the Neolithic to the medieval period (Caseldine, 1996). It produces good firewood and is a suitable wood for

kindling. The wood is soft enough to be split yet flexible and strong enough to be used in rope making and basketry. It has also proved a useful resource in the construction of hurdles, wattling, palisades and trackways from prehistoric times (Pilcher & Hall, 2001).

***Fraxinus excelsior* (ash)**

Ash thrives well on nutrient-rich soils but is also a common woodland species and grows in mixed woodland with oak on damp, slightly acidic soils (Gale & Culter, 2000). Pollen analysis indicates that ash became more common in the pollen record from the Neolithic period onwards (Mitchell, 1953/4). This could be as a result of more clearance due to agricultural practices at the time, where ash was able to germinate and grow more vigorously as secondary woodland and in marginal areas and hedges (Kelly, 1976).

5.2 Distribution of charcoal remains from Site 35, Windmill (Fig. 2)

With the exception of one solitary carbonized *Galium* sp. seed, charcoal was the primary charred material recorded from the pits and postholes excavated at Site 35. Charcoal is a common result of occupational activity on archaeological sites and usually reflects the use of hearths and burning activities in and around the site and/or cleaning out and dumping of this burnt debris into nearby open features.

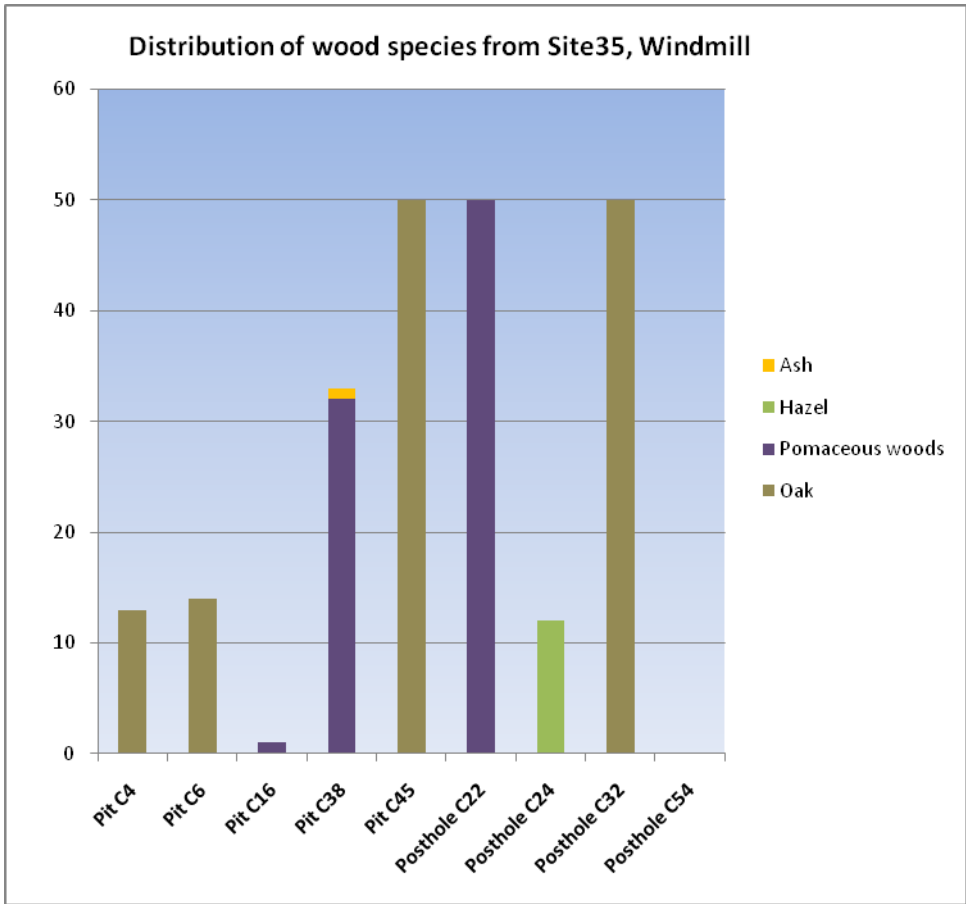

Fig. 2

At Site 35, pits **(C4, C6** and **C45)** and posthole **(C32)** contained exclusively oak charcoal. While the presence of just oak from **C4, C6** and **C45** may suggests that this species was being burnt for specific activities, the absence of finds or other carbonized plant remains from these features makes it difficult to fully interpret these activities. Oak was also a very popular resource for construction in the prehistoric and medieval period and its presence from posthole **C32** suggests it may represent structural wood. Similarly, the high occurrence of pomaceous woods from posthole **C22** and hazel from posthole **C24** could also reflect the remains of structural wood, with emphasis on these wood species for construction.

Charred wood from posthole deposits is often the result of construction methods such as a) the charring of post bases to prevent the timbers from rotting b) a way of re-sizing posts of c) the method by which the timbers were felled. It is also possible that the charcoal reflects the remains of burning debris which became incorporated into sealing and infilling posthole deposits from nearby firing events. Without more samples it is difficult to ascertain whether this material is the remains of a burnt structure or not.

Pit **C38** contained high values for pomaceous woods. The low occurrence of pomaceous woods from pit **C16** and ash from pit **C38** could just represent the residual remains of firing debris which had become re-deposited across the site, entering these features inadvertently.

Since no other botanical remains associated with domestic activity or arable farming was identified, it is difficult to ascertain the exact function of these pits and if any of the features were associated with each other.

6 Conclusions

The analysis of the plant remains and wood charcoal from pit **(C38)**, pits **(C4, C6, C16 and C45)** and postholes **(C22, C24, C32** and **C54)** at Site 35 Windmill provided the opportunity to highlight and interpret the archaeobotanical material recorded at the site.

No botanical remains indicative of arable agriculture or domestic activity were recorded at the site. The presence of oak, pomaceous woods and hazel charcoal from many of the postholes recorded may represent the remains of structural wood at the site. The high oak charcoal from pits **(C4, C6** and **C45)** may represent specific burning activities. Oak, hazel and ash would have been common to the opened woodland, while pomaceous woods would have grown on the woodland margins or in scrubby clearances.

7 Recommendations

1. There is no further identification work required on these samples from Site 35, Windmill. Any additional processed samples associated with features excavated at the site should also be scanned to determine if there are any other plant remains present, which may help with the interpretations put forward.
2. All flot samples associated with Site 35 should be retained permanently in accordance with the National Monuments Act 1930 (Section 2) and the National Monuments Act 1994 (Section 9) and for future archaeobotanical research studies to be carried out.
3. A record of the methodology and results of this analysis should be included in any final report

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Table 1. Composition of plant remains from Site 35, Windmill (03E0424)

Context number	Sample number	Flot volume (grams)	Context description	Wood charcoal	Carbonized wild taxa	Comments
3	2	1.5 grams	Fill of pit C4	++		
5	1	2.3 grams	Fill of pit C6	++		
15	4	<1 gram	Fill of pit C16	+		
21	8	30.6 grams	Fill of posthole C22	++++		
23	7	3.9 grams	Fill of posthole C24		+	Galium sp. (x1)
31	3	27.2 grams	Fill of posthole C32	++++		Stones only
37	6	3 grams	Fill of pit C38	+++		
46	5	24.6 grams	Fill of pit C45	++++		
53	9	24 grams	Fill of posthole C54			Stones only

Key: + = rare (1-10), ++ = occasional (11-50), +++ = common (51-100) and ++++ = abundant (>100)

Table 2. Charcoal Identifications from Site 35, Windmill (03E0424) - see next

Context number	Sample number	Flot volume (grams)	Context description	Wood Species Identifications	No. of fragments	Charcoal weights (grams)	No. of growth rings
3	2	1.5 grams	Fill of pit C4	Quercus sp. (oak)	13	1 gram	2 - 4 rings
5	1	2.3 grams	Fill of pit C6	Quercus sp. (oak)	14	0.8 grams	2 - 3 rings
15	4	<1 gram	Fill of pit C16	Maloideae spp. (pomaceous woods)	1	0.1 grams	
21	8	30.6 grams	Fill of posthole C22	Maloideae spp. (pomaceous woods)	50	7.4 grams	2 - 7 rings
23	7	3.9 grams	Fill of posthole C24	Corylus avellana (hazel)	12	0.9 grams	2 - 3 rings
31	3	27.2 grams	Fill of posthole C32	Quercus sp. (oak)	50	3 grams	2 - 5 rings
37	6	3 grams	Fill of pit C38	Maloideae spp. (pomaceous woods)	32	1.3 grams	2 - 5 rings
				Fraxinus excelsior (ash)	1	0.1 grams	
46	5	24.6 grams	Fill of pit C45	Quercus sp. (oak)	50	4.1 grams	2 - 6 rings
53	9	24 grams	Fill of posthole C54				

Appendix 7 Faunal Report

INTRODUCTION

Faunal material was found at over twenty different sites during excavations along the route of the N8 Cashel Bypass and the N74 Link Road dating variously from the prehistoric to the post-medieval periods. The volume of recovered animal bones varied considerably between the sites with relatively large quantities of bone being recovered from a ringfort in Hughes' Lot East (Site 25ii), from a multiperiod site (Site 25iv) also in Hughes' Lot East, from a large settlement site in Owens' & Biggs' Lot and from a site in Farranamanagh (Site 41). Animal bones were found in relatively small amounts from sites excavated in the townlands of Ballyknock, Monadreela, Boscabell, George's-Land, Cooper's Lot and Windmill. The excavations revealed evidence of a series of structures and deposits dating principally to the Early Medieval and Late Medieval periods. Relatively large samples of prehistoric animal bone were also recovered from five *fulachtaí fiadh* in Owens' & Biggs'-Lot. The animal remains were hand collected and consist almost entirely of mammal bone. A few bird bones were recovered in the samples but not in sufficient quantities to comment on the fowling activities of the occupants of the various sites involved. The total absence of fish bones is not surprising given the inland location of the excavated sites. Many of the recovered bone assemblages are extremely small and the data does little more than indicate the exploitation of certain species. While these samples are too small to reach secure conclusions on diet and economy, the results have nevertheless provided additional information on animal exploitation in this area of South Tipperary during the various periods represented.

METHODS

All fragments were identified to species, or as nearly as possible, using the modern comparative collections of mammals, birds and fish in the Department of Archaeology, University College Cork. Data were recorded onto the Archaeological Services Unit's faunal sheets, which include categories for butchery, ageing and sexing as well as species and element identification. Identifications were taken to species where possible while those fragments for which specific identification could not be made were classed in terms of size and morphological character. The material recorded as 'large mammal (LM)' in the tables for instance is likely to belong to cattle but was too small to eliminate the possibility of horse and red deer. Similarly, specimens that in all probability were sheep but which may have also originated from goat, pig or large dog were recorded as 'medium mammal (MM)'. The separation of ovicaprid material relied on comparison with reference material and to the discussion in Boessneck (1969). Very few definite elements of goat were recognised and those postcranial bones which allow for discrimination between the two species were all identified to sheep. Ageing data were determined using procedures outlined by Silver (1971) for long bones and Grant (1975) for mandibles. The relative

proportion of the different species was assessed using the fragments total only as the samples were considered too small to estimate the minimum number of individuals present.

CONDITION

Bone preservation at those sites which produced reasonably large collections of bone was generally recorded as good with very little evidence for pre and post-depositional alteration. The bones from surface features at all sites were noticeably weathered which suggests that a certain degree of mixing had taken place and eroded brittle fragments, perhaps from earlier phases of occupation, were found together with well-preserved bone. Fragmentation rates throughout were noticeably high resulting in large numbers of bones that could only be classified as large and medium mammal remains. High fragmentation levels at some sites are attributed to butchering and food preparation techniques while the poor conditions of preservation at other sites appear to have led to increased fragmentation. Despite the low counts for dog in all of the samples, gnawing was observed on 7% of the specimens indicating that a certain amount of food waste was scavenged prior to deposition into the various features. The proportion of burnt bone was low indicating that the preferred cooking method at all sites seems to have been by boiling as very few of the bones exhibited signs of charring associated with roasting. A few specimens from the deposits were charred and blackened and this type of damage may have occurred while certain joints of meat were spit roasted over a large open fireplace. The extremely calcined nature of other fragments suggests that bones were occasionally cast into the fire as a means of waste disposal and remained there for a sufficient time to take on the white cracked appearance of heat-shattered bone.

ANALYSIS

Animal bones were recovered from 22 excavated archaeological sites along the route of the road network and the results of the faunal analysis are described below by each individual excavation.

Site 35:03E0424

Windmill

Animal bones from Site 35 were recovered from the fill **37** of a possible prehistoric pit **38**, and from the fill of a pit of unknown date. The prehistoric pit contained 12 small pieces of unburnt bone that can be classified as fragments of long bone from a medium-sized animal such as sheep or pig. A pit cut into the field boundary ditch **55** produced a collection of 43 sheep/goat bones representing a single juvenile

individual. The bones are large and complete and seem to represent the relatively recent burial of an animal that died from natural causes.

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Appendix 8 Post Medieval Pottery Report

The pottery from

Site 35: Windmill (03E0424)

N8 by-pass and the N74 link road, Cashel, Co. Tipperary

Clare McCutcheon MA MIAI

Introduction:

A total of eight sherds of pottery were presented for study. Following identification and reassembly, this was reduced to five sherds, all dating from the 18th to 19th century.

Methodology:

The material has been identified visually and the information has been entered on an Access database.

Fabric	Sherds	MNV	MVR	Form	Date
Black glazed ware	1	-	1	Jar	L17th-19th
Glazed red earthenware	3	-	2	Bowls	L17th-19th
Shell-edged ware	1	-	1	Plate	19th
Total	**5**	**-**	**4**		

Table 1: Pottery identification, Site 35: Windmill (03E0424)

Black glazed ware:

Black glazed wares are most commonly found in Dublin and the east coast, originating from Lancashire and north Wales i.e. the so-called Buckley wares. The amount of these wares in Cork is limited, their place being filled by the glazed red earthenwares (below). Both fabrics are the successors of the North Devon gravel tempered wares, large vessels used for the dairy, kitchen and toilet. Some tablewares such as cups and jugs are also made, but equally, roof-tiles are also made in these wares. In contrast, the industrial production of tables ware in Staffordshire supplanted the corresponding 17th century North Devon sgraffito wares.

Black glazing results from the addition of iron to lead glaze on the red earthenware fabrics. The fabric is often highly fired to near stoneware purple, although other varieties have a white marbled appearance. The fabric of the black glazed wares made in Ireland appears to be a less highly fired red earthenware (Meenan 1997, 349).

Glazed red earthenware:

Glazed red earthenware or 'brownwares' were made widely in Britain and Ireland from the later 17th century through to the 19th century (Dunlevy 1988, 24-5). Because of the standardisation of the clay and vessel form it is always difficult to specify a particular production site but a typical kiln was excavated at Tuam, Co. Galway with milk pans and dishes comprising a majority of the vessels (Carey & Meenan 2004). The fabric is generally sandy earthenware, usually oxidised buff to light orange through to brown. The clear lead glaze takes its colour from the fabric with variations due to firing conditions (Jennings 1981, 157).

Shell-edged ware:

This term describes 'a moulded border decoration on the scalloped rim of certain plates, principally of pearlware, but first used on Bow porcelain and creamware' (Savage & Newman 2000, 262).

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Appendix 9 Small Finds Report

by TVAS Ireland Ltd & Marcella Laughman

N8 Cashel Bypass & N74 Link Road

03E0424, Site 35, Windmill, Cashel, Co. Tipperary

Small Finds Report

Five finds were retrieved during the excavation at Site 35 at Windmill: a single ceramic, two metallic pieces and two glass fragments.

Ceramic

Brick

Red brick fragment (03E0424:13) was recovered from fill (019) of a post-medieval pit [020]. This small fragment has occasional small gravel inclusions while occasional buff coloured clay present creates a marble effect.

Glass

Both glass finds came from fill (051) of post-medieval pit [052]. They are a very small black glass fragment of unidentified origin (03E0424:02) and green glass bottle body fragment (03E0424:07).

Metal

Both metal fragments were found in topsoil (01). They are a nail / bolt (03E0424:08) and a perforated copper alloy washer / cap (03E0424:11) of unknown origin.

Table 1 below gives more detailed description and dimensions of the finds.

Find No.	Context	Category	Type	Identification	Description
03E0424:02	51	Unidentified	Glass	Fragment	Very small fragment of black glass. Unidentified. L: 7 mm; W: 7 mm; T: 3 mm. Weight: <1 g.
03E0424:07	51	Glass	Bottle	Body fragment	Green glass bottle body fragment. L: 26 mm; W: 24.1 mm; T: 3 mm. Weight: 3 mm.
03E0424:08	01	Nails	Iron	Nail / bolt	Round head, round shank, badly corroded and encrusted. L 58 mm; W 25 mm. Weight 47 g.
03E0424:11	01	Unidentified	Copper alloy	Washer / cap	Disc shaped with bend edge. Large perforation in centre. Diam 29 mm T 4 mm. Weight 4 g.
03E0424:13	19	Brick	Brick	Fragment	Small red brick fragment with occasional small gravel inclusions. Occasional buff coloured clay throughout to create a marble effect. L: 31.2 mm; W: 24 mm; T: 24 mm. Weight: 13 g.

Table 1: Site 35 Finds Overview

Appendix 10 Radiocarbon Dates

Site 35: 03E0424	Lab code UBA - 13798	Context 05) Sample 1: Oak charcoal *Quercus sp.*	Radiocarbon Age BP 4899 +/- 36	Calibration data set: intcal 09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 3700–3650	1.000
		95.4 (2 sigma)	cal BC 3763–3724	0.095
			3715–3638	0.905

Site 35: 03E0424	Lab code UBA - 13797	Context 31 Sample 3: Oak charcoal *Quercus sp.*	Radiocarbon Age BP 3901 +/- 28	Calibration data set: intcal 09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 2464–2399	0.628
			2383–2347	0.372
		95.4 (2 sigma)	cal BC 2469–2331	0.892
			2328–2299	0.108

Site 35: 03E0424	Lab code UBA - 13800	Context 03 Sample 2: Oak charcoal *Quercus sp.*	Radiocarbon Age BP 3735 +/- 24	Calibration data set: intcal 09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 2198–2164	0.443
			2151–2131	0.246
			2084–2056	0.311
		95.4 (2 sigma)	cal BC 2204–2113	0.638
			2101–2037	0.362

Site 35: 03E0424	Lab code UBA - 13795	Context 46 Sample 5: Hazel charcoal *Corylus avellana*	Radiocarbon Age BP 3639 +/- 34	Calibration data set: intcal 09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 2112–2102	0.064
			2036–1948	0.936
		95.4 (2 sigma)	cal BC 2134–2080	0.179
			2061–1910	0.821

Site 35:	Lab code	Context 15	Radiocarbon Age BP	Calibration data set: intcal
03E0424	UBA - 13801	Sample 4: Pomaceous charcoal *Pomoideae sp.*	3477 +/- 38	09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 1878–1840	0.349
			1827–1793	0.301
			1784–1747	0.351
		95.4 (2 sigma)	cal BC 1893–1727	0.928
			1721–1691	0.072

Site 35:	Lab code	Context 53	Radiocarbon Age BP	Calibration data set: intcal
03E0424	UBA - 13794	Sample 9: Hazel charcoal *Corylus avellana*	3392 +/- 29	09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 1738–1707	0.421
			1697–1663	0.457
			1651–1641	0.122
		95.4 (2 sigma)	cal BC 1751–1616	1.000

Site 35:	Lab code	Context 37	Radiocarbon Age BP	Calibration data set: intcal
03E0424	UBA - 13793	Sample 6: Pomaceous charcoal *Pomoideae sp.*	3037 +/- 25	09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 1373–1341	0.376
			1318–1266	0.624
		95.4 (2 sigma)	cal BC 1393–1256	0.945
			1237–1215	0.055

Site 35:	Lab code	Context 21	Radiocarbon Age BP	Calibration data set: intcal
03E0424	UBA - 13796	Sample 8: Pomaceous charcoal *Pomoideae spp.*	2989 +/- 28	09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability distribution
		68.3 (1 sigma)	cal BC 1293–1193	0.929
			1142–1133	0.071
		95.4 (2 sigma)	cal BC 1370–1356	0.019
			1316–1126	0.981

Site 35:	Lab code	Context 23	Radiocarbon Age BP	Calibration data set: intcal
03E0424	UBA - 13799	Sample 7: Hazel charcoal *Corylus avellana*	741 +/- 36	09.14c # Reimer *et al* 2009
		% area enclosed	cal AD ranges	Relative area under probability probability distribution
		68.3 (1 sigma)	cal AD 1252–1288	1.000
		95.4 (2 sigma)	cal AD 1217–1297	0.997
			1374–1376	0.003

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13793
Date of Measurement:	2010-07-09
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S6 35038
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 3037±25

AMS δ^{13}C: -25.2

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13794
Date of Measurement:	2010-07-09
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S9 35053
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 3392±29

AMS δ^{13}C: -27.5

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13795
Date of Measurement:	2010-07-09
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S5 35046
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date:	3639±34
AMS δ^{13}C:	-24.6

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13796
Date of Measurement:	2010-07-09
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35S8 35021
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 2989±28

AMS δ^{13}C: -24.2

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13797
Date of Measurement:	2010-07-09
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S3 35031
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 3901±28

AMS δ^{13}C: -26.0

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13798
Date of Measurement:	2010-07-09
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S1 35005
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 4899±36

AMS δ^{13}C: -28.1

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13799
Date of Measurement:	2010-05-29
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S7 35024
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date:	741±36
AMS δ^{13}C:	-26.3

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13800
Date of Measurement:	2010-07-09
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S2 35003
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date:	3735±24
AMS δ^{13}C:	-22.6

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-13801
Date of Measurement:	2010-05-29
Site:	N8Cashel Bypass Site35 03E0424
Sample ID:	35 S4 35016
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date:	3477±38
AMS δ^{13}C:	-24.8

68.3 (1 sigma)	cal BC	1888- 1871	0.218
		1845- 1811	0.430
		1803- 1776	0.352
95.4 (2 sigma)	cal BC	1909- 1756	1.000

35 S6 3503
UBA-13793

Radiocarbon Age BP 3037 +/- 25
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed		cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC	1373- 1341	0.376
		1318- 1266	0.624
95.4 (2 sigma)	cal BC	1393- 1256	0.945
		1237- 1215	0.055

35 S9 3505
UBA-13794

Radiocarbon Age BP 3392 +/- 29
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed		cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC	1738- 1707	0.421
		1697- 1663	0.457
		1651- 1641	0.122
95.4 (2 sigma)	cal BC	1751- 1616	1.000

35 S5 3504
UBA-13795

Radiocarbon Age BP 3639 +/- 34
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed		cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC	2112- 2102	0.064
		2036- 1948	0.936
95.4 (2 sigma)	cal BC	2134- 2080	0.179
		2061- 1910	0.821

35S8 35021
UBA-13796

Radiocarbon Age BP 2989 +/- 28
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed		cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC	1293- 1193	0.929
		1142- 1133	0.071
95.4 (2 sigma)	cal BC	1370- 1356	0.019
		1316- 1126	0.981

35 S3 3503
UBA-13797

Radiocarbon Age BP 3901 +/- 28
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed		cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC	2464- 2399	0.628
		2383- 2347	0.372
95.4 (2 sigma)	cal BC	2469- 2331	0.892
		2328- 2299	0.108

35 S1 3500
UBA-13798

Radiocarbon Age BP 4899 +/- 36
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed		cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC	3700- 3650	1.000
95.4 (2 sigma)	cal BC	3763- 3724	0.095
		3715- 3638	0.905

35 S2 3500
UBA-13800

Radiocarbon Age BP 3735 +/- 24
Calibration data set: intcal09.14c # Reimer et al. 2009
% area enclosed cal AD age ranges relative area under

			probability distribution
68.3 (1 sigma)	cal BC	2198- 2164	0.443
		2151- 2131	0.246
		2084- 2056	0.311
95.4 (2 sigma)	cal BC	2204- 2113	0.638
		2101- 2037	0.362

38i S11 38
UBA-13803
Radiocarbon Age BP 1942 +/- 22
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges		relative area under probability distribution
68.3 (1 sigma)	cal AD	26- 42	0.265
		47- 81	0.735
95.4 (2 sigma)	cal AD	5- 90	0.892
		99- 123	0.108

38i S10 38
UBA-13804
Radiocarbon Age BP 1962 +/- 24
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges		relative area under probability distribution
68.3 (1 sigma)	cal AD	18- 70	1.000
95.4 (2 sigma)	cal BC	38- 8	0.079
		4- cal AD 84	0.921

38iiS50 38
UBA-13805
Radiocarbon Age BP 3021 +/- 23
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges		relative area under probability distribution
68.3 (1 sigma)	cal BC	1370- 1356	0.122
		1316- 1259	0.788
		1230- 1219	0.091
95.4 (2 sigma)	cal BC	1386- 1328	0.238
		1326- 1209	0.760
		1137- 1135	0.002

38iiS63 38
UBA-13806
Radiocarbon Age BP 4009 +/- 32
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges		relative area under probability distribution
68.3 (1 sigma)	cal BC	2569- 2515	0.767
		2501- 2484	0.233
95.4 (2 sigma)	cal BC	2618- 2609	0.015
		2597- 2595	0.004
		2582- 2468	0.981

39 S13 390
UBA-13807
Radiocarbon Age BP 3787 +/- 26
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges		relative area under probability distribution
68.3 (1 sigma)	cal BC	2281- 2249	0.401
		2231- 2218	0.133
		2213- 2196	0.201
		2170- 2146	0.265
95.4 (2 sigma)	cal BC	2291- 2139	1.000

39 S24 391
UBA-13808
Radiocarbon Age BP 1045 +/- 21
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges		relative area under probability distribution
68.3 (1 sigma)	cal AD	990- 1016	1.000
95.4 (2 sigma)	cal AD	905- 912	0.021
		971- 1024	0.979

25iv S4 25
UBA-13780
Radiocarbon Age BP 1182 +/- 37
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 779- 793	0.134
	802- 889	0.866
95.4 (2 sigma)	cal AD 719- 742	0.036
	769- 903	0.838
	915- 968	0.126

34 S2 3400
UBA-13787
Radiocarbon Age BP 3186 +/- 38
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1494- 1431	1.000
95.4 (2 sigma)	cal BC 1526- 1397	1.000

35 S7 3502
UBA-13799
Radiocarbon Age BP 741 +/- 36
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 1252- 1288	1.000
95.4 (2 sigma)	cal AD 1217- 1297	0.997
	1374- 1376	0.003

35 S4 3501
UBA-13801
Radiocarbon Age BP 3477 +/- 38
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1878- 1840	0.349
	1827- 1793	0.301
	1784- 1747	0.351
95.4 (2 sigma)	cal BC 1893- 1727	0.928
	1721- 1691	0.072

38i S2 380
UBA-13802
Radiocarbon Age BP 2841 +/- 39
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1049- 968	0.729
	963- 930	0.271
95.4 (2 sigma)	cal BC 1123- 906	1.000

41 S7 4101
UBA-13810
Radiocarbon Age BP 3316 +/- 40
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1634- 1528	1.000
95.4 (2 sigma)	cal BC 1690- 1500	1.000

E2285 S27
UBA-13819
Radiocarbon Age BP 3031 +/- 40
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution

```
Calibration data set: intcal09.14c                  # Reimer et al. 2009
  % area enclosed       cal AD age ranges              relative area under
                                                     probability distribution
  68.3 (1 sigma)     cal AD 1225- 1273                       1.000
  95.4 (2 sigma)     cal AD 1189- 1197                       0.015
                            1207- 1286                       0.985
```

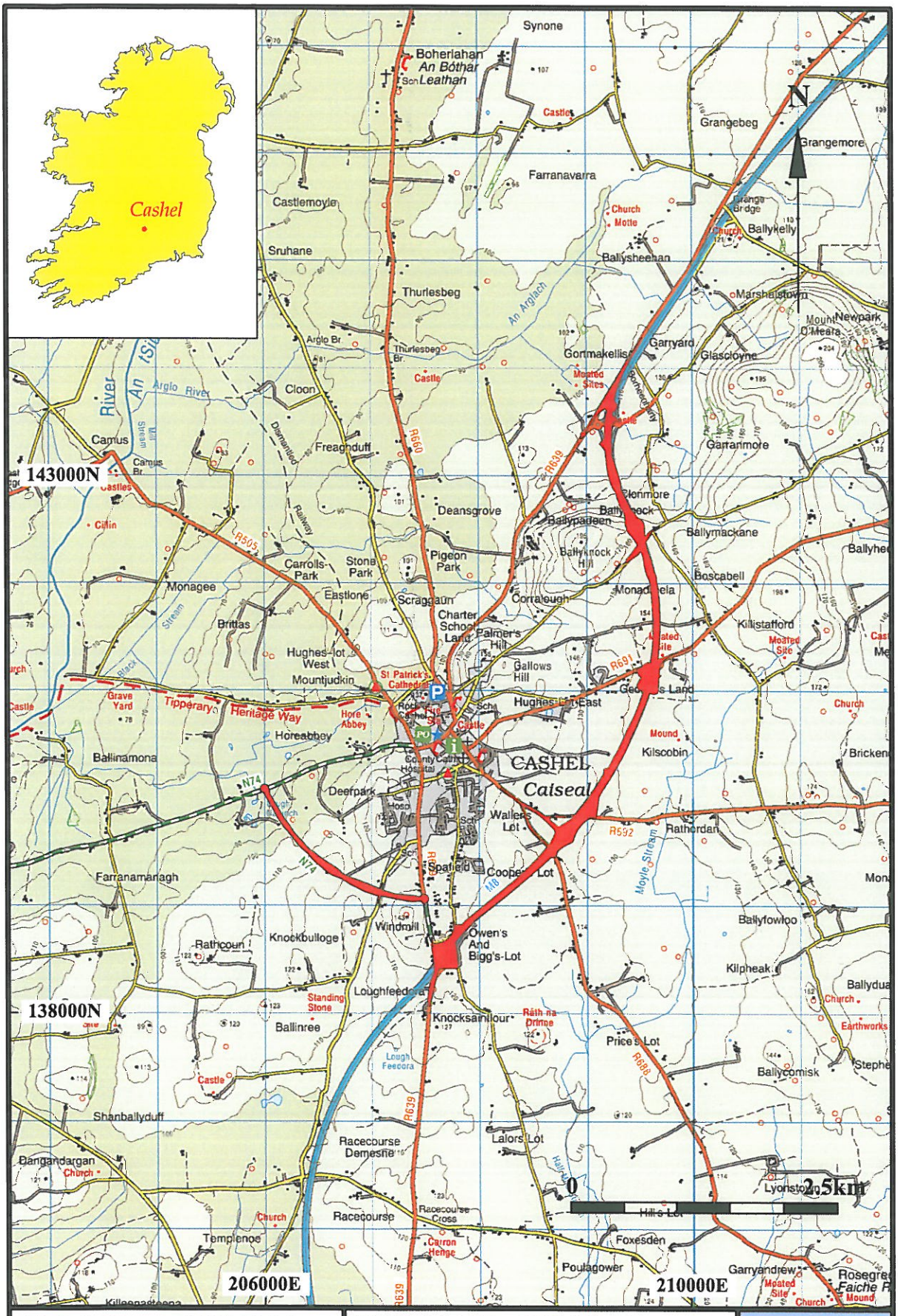
References for calibration datasets:

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.

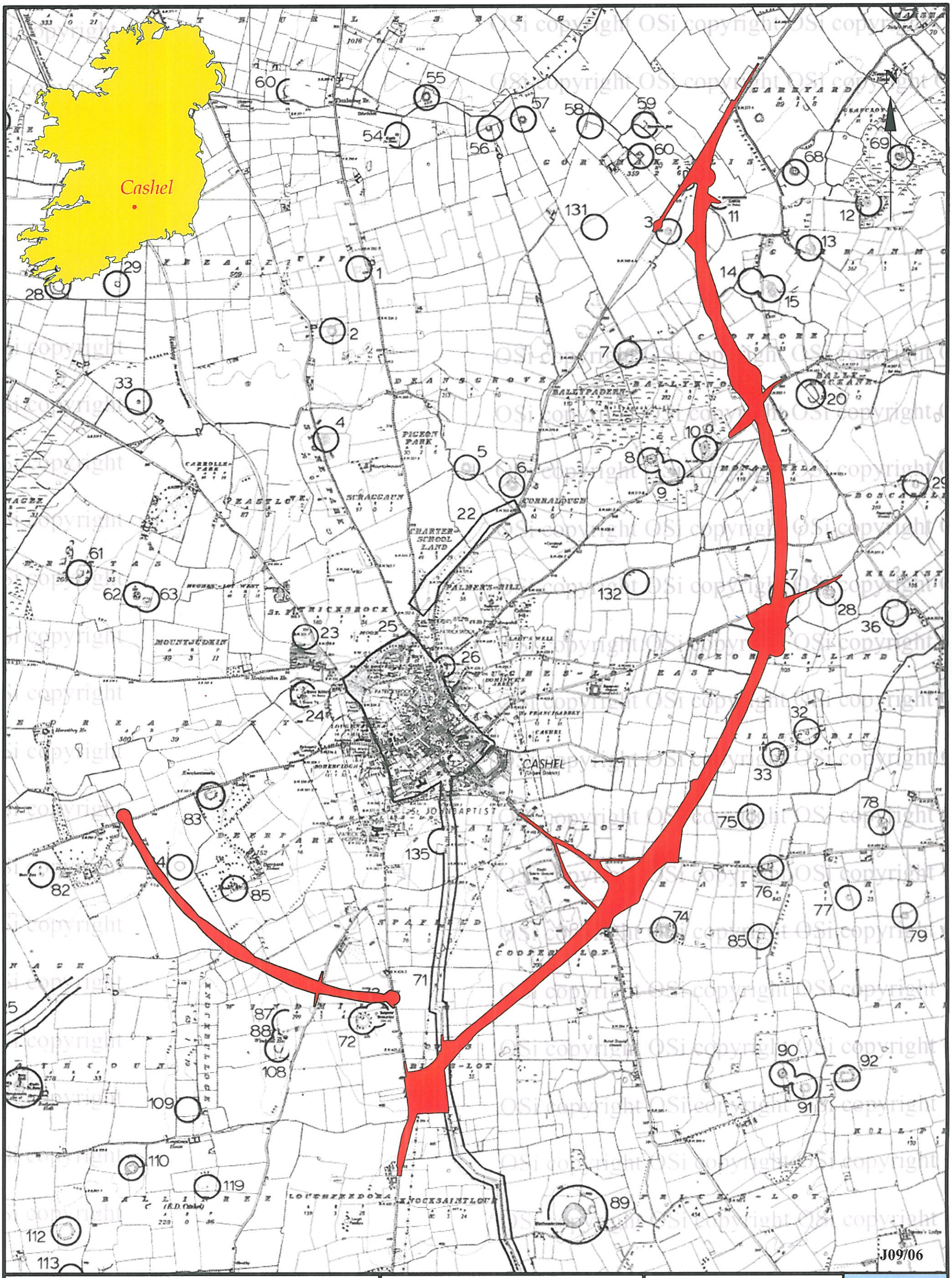


N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Figure 1: Location of N8 Scheme

Scale 1:50 000

TVAS IRELAND LTD



N8 Cashel Bypass & N74 Link Road,Co. Tipperary

Based on RMP Map (1998) (SR) - sheet 52, 53, 60, 61, 68, 69.

Figure 2: Scheme Location & RMP Details

Scale 1:20 000

0 1km

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207400E

207800E

208200E

N

149300N

SPAFIELD

Sports Field

Site 33

Site 32

Site 36i

Site 35

Site 34

Site 31

138900N

Site 30ii

OWEN'S LAND

BIGG'S–LOT

Site 30iii

138500N

138100N

LOUGHFEEDORA

KNOCKSAINTLOUR

Key:

- Water course/Pond

N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Figure 3: Location of Sites 30ii-36i

Scale 1:5000

Based on Ordnance Survey 1st Edition, Co. Tipperary, Sheet 61, 6"
Surveyed 1840-41. Copyright OSI & Govt. of Ireland. OSI Licence: AR0049410

0 250m

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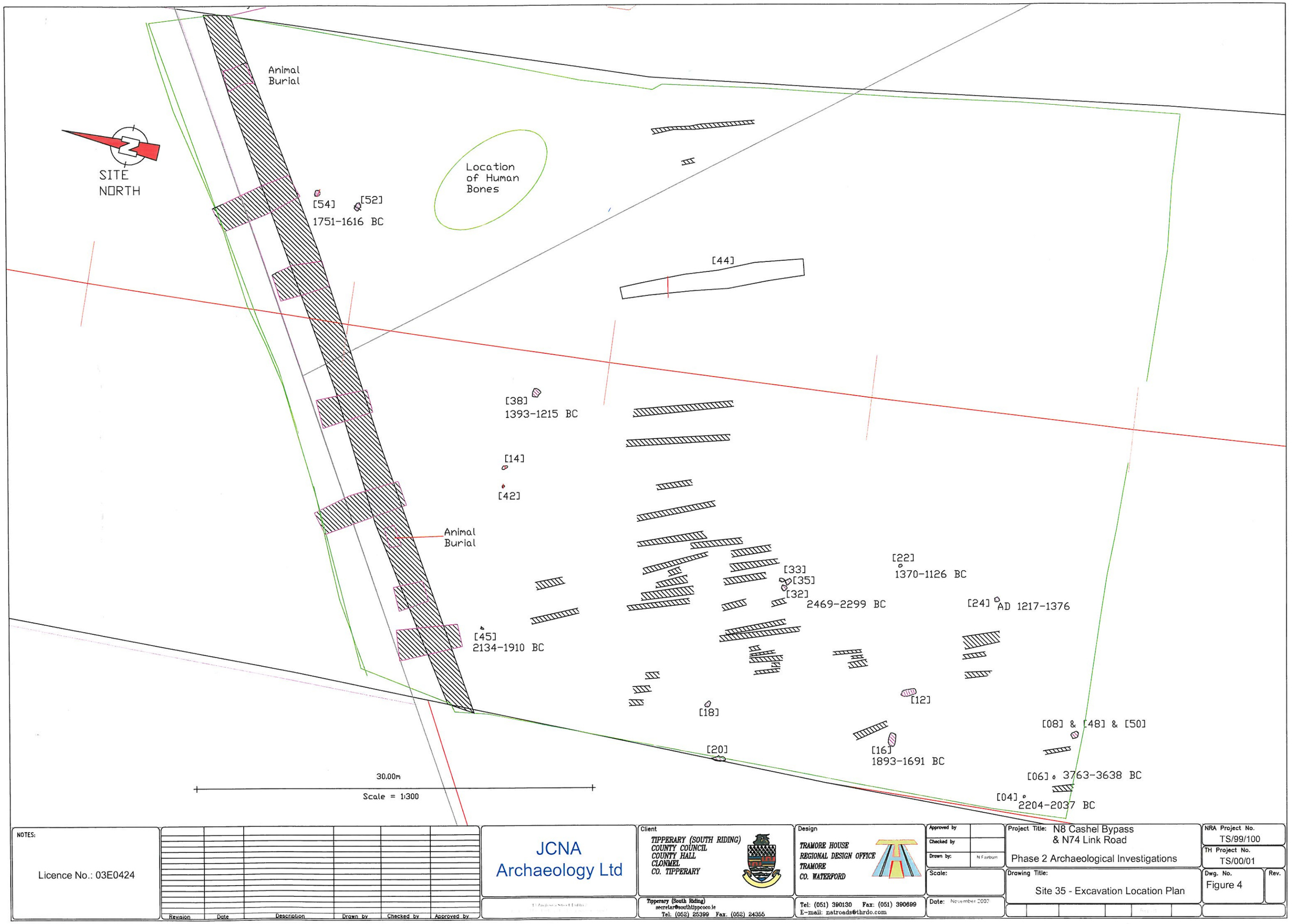

NOTES:

Licence No.: 03E0424

Revision	Date	Description	Drawn by	Checked by	Approved by

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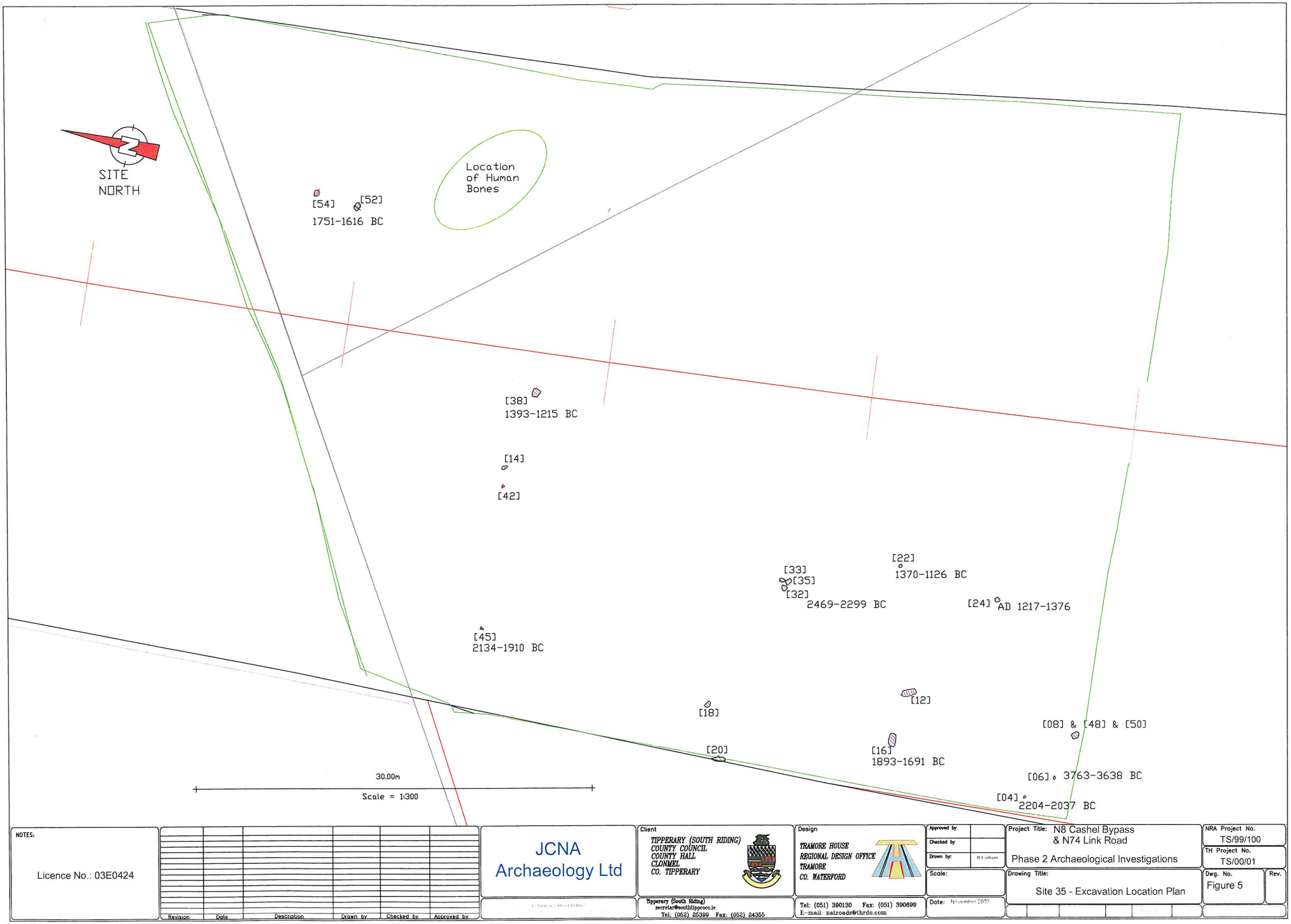
Scale:	
Date:	November 2003

Project Title: N8 Cashel Bypass & N74 Link Road
Phase 2 Archaeological Investigations

Drawing Title: Site 35 - Excavation Location Plan

NRA Project No. TS/99/100
TH Project No. TS/00/01
Dwg. No. Figure 4
Rev.



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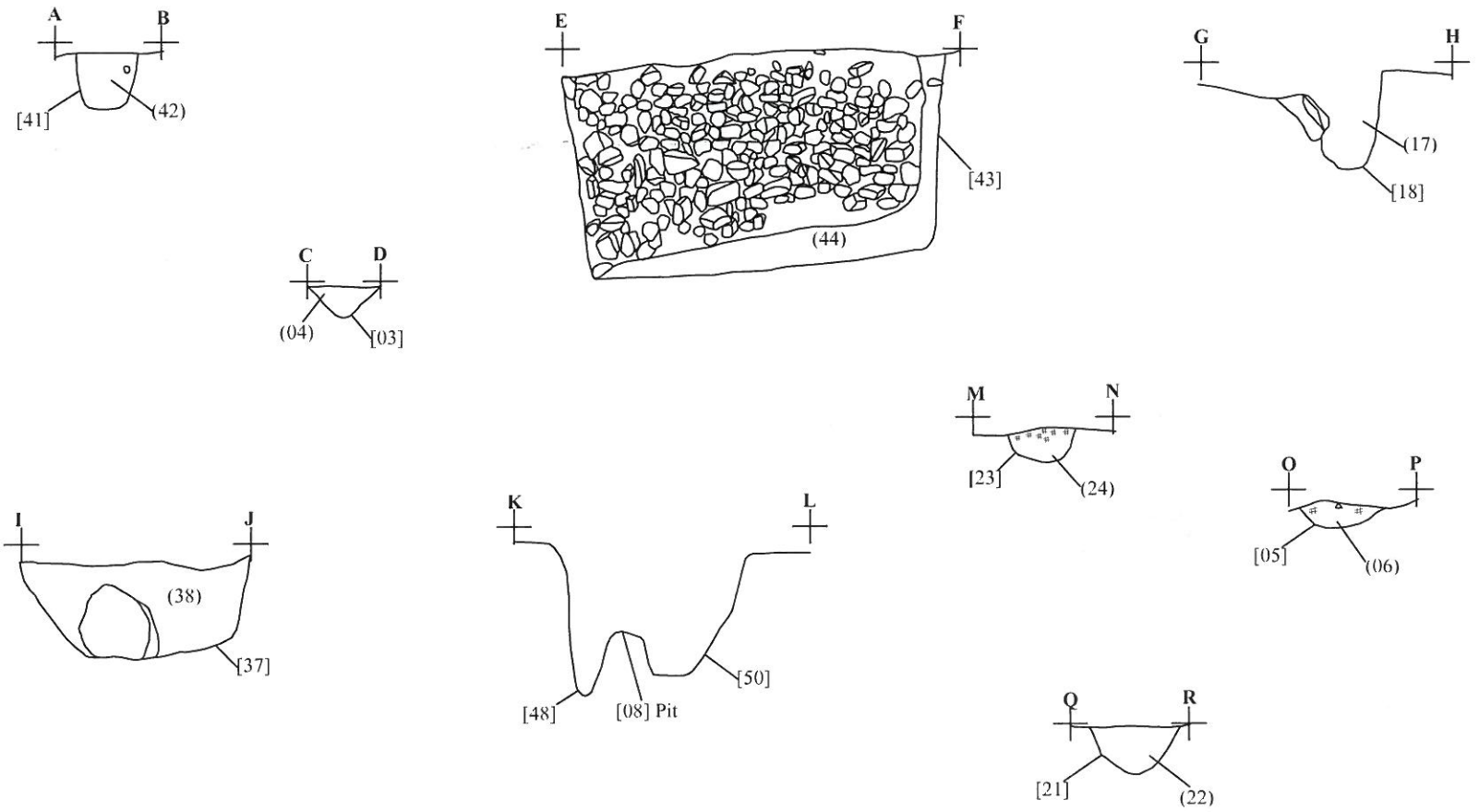
Phase 2 Archaeological Investigations

Drawing Title: Site 35 - Excavation Location Plan

NRA Project No. TS/99/100
TH Project No. TS/00/01
Dwg. No. Figure 5
Rev.



N8 Cashel Bypass & N74 Link Road

Windmill, Site 35 03E0424

Figure 6: Sections of features [05], [18], [21], [23], [37], [41] & [43]; pit [08] containing stakeholes [48] & [50]
Scale 1:20

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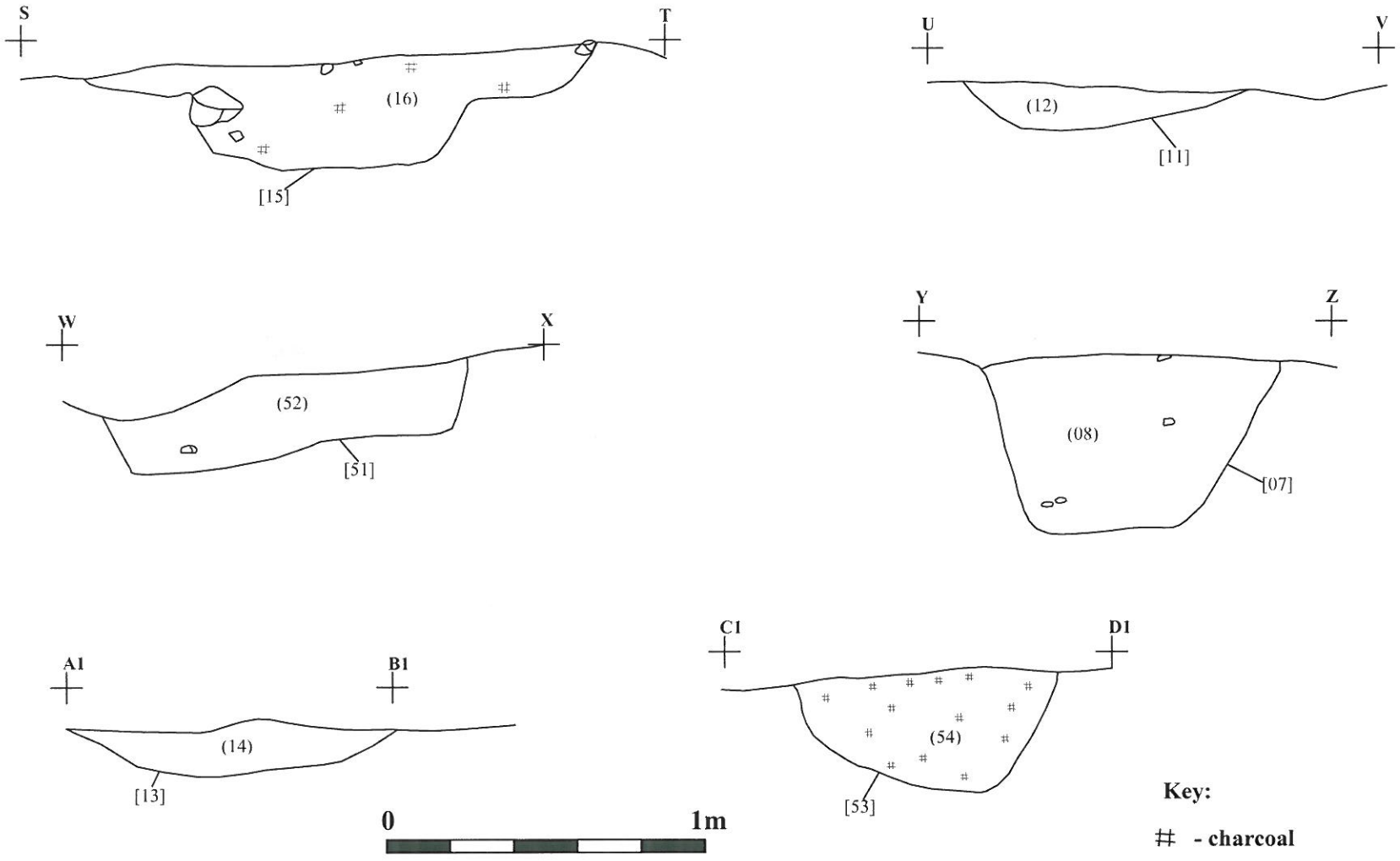

N8 Cashel Bypass & N74 Link Road

Windmill, Site 35 03E0424

Figure 7: Sections of features [07], [11], [13], [15], [51] & [53]

Scale 1:10

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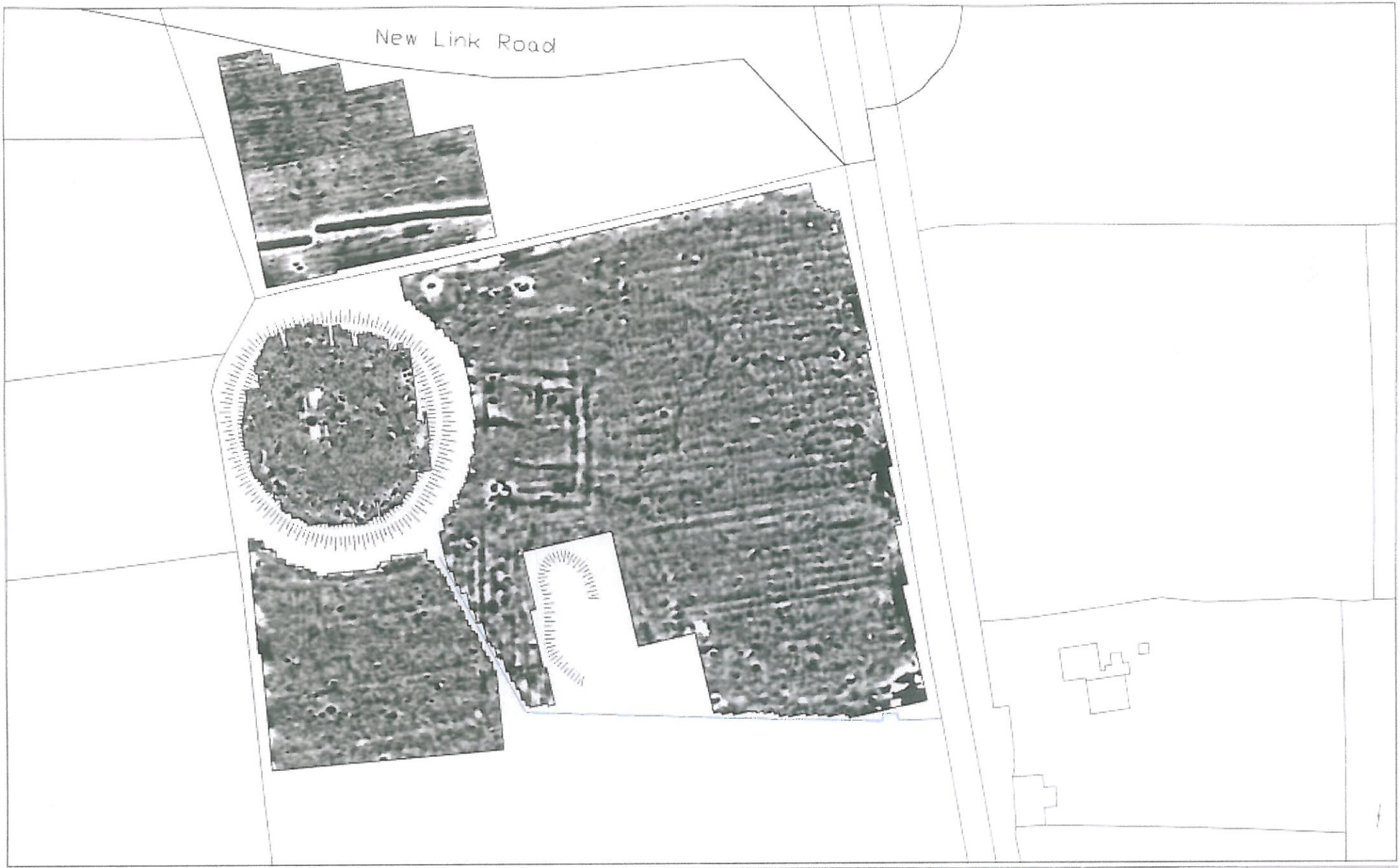


Legend

Basemap

Electric Fence

nT

-1 0 1

Site Location: Windmill Hill, Windmill, Cashel, County Tipperary

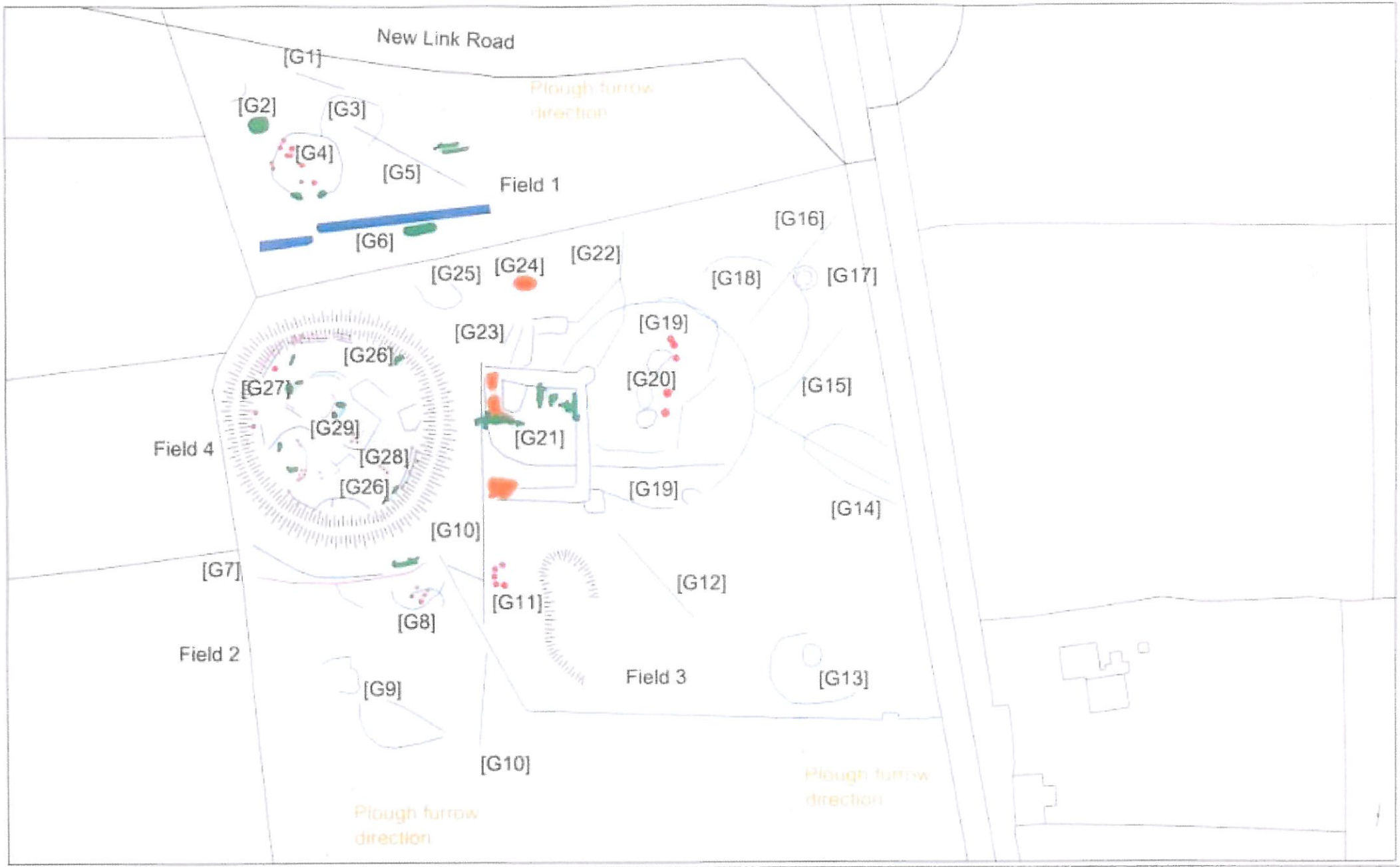
Client: Mr R. O'Brien

Drawing Courtesy of: | Date: 10/01/12 | Drawing No.: 11-030/06

0m 40m 80m

Figure No. 8 Magnetic Gradiometer data

EARTHSOUND archaeological geophysics



Legend

Basemap
Electric Fence

Ditch
Possible Ditch
Possible Stone Feature
Possible Pit
Magnetic Enhancement - possibly archaeologically significant
Highly Magnetic Signatures - possibly archaeologically significant

Site Location: Windmill Hill, Windmill, Cashel, County Tipperary

Client: Mr R. O'Brien

Drawing Courtesy of: | Date: 10/01/12 | Drawing No.: 11-03/09

0m 40m 80m

Figure No. 9 Magnetic Gradiometer Interpretation

EARTHSOUND archaeological geophysics