N18 Ennis Bypass
and N85 Western Relief Road

Site AR127, Cahircalla More, Co. Clare

Final Archaeological Excavation Report

for Clare County Council

Licence No: 04E0028

by Kate Taylor

Job J04/02

(NGR 132700 175500)

14th August 2006

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Summary

Site name: N18 Ennis Bypass and N85 Western Relief Road, Site AR127, Cahircalla More, Co. Clare

Townland: Cahircalla More

Parish: Drumcliff

Barony: Islands

County: Clare

SMR/RMP Number: N/A

Planning Ref. No: N/A

Client: Clare County Council, New Road, Ennis, Co. Clare

Landowner: Clare County Council, New Road, Ennis, Co. Clare

Grid reference: 132700 175500 (OSI Discovery Series, 1:50,000, Sheet 58. OS 6" Clare Sheet 33)

Naturally occurring geology: Mid orange sandy clay at north-west; peat overlying clay and gravel at south-east

TVAS Ireland Job No: J04/02

Licence No: 04E0028

Licence Holder: Kate Taylor

Report author: Kate Taylor

Site activity: Excavation

Site area: 5108m^2

Sample percentage: 100%

Date of fieldwork: 28th January to 12th February 2004

Date of report: 14th August 2006

Summary of results: Eight discrete excavation areas were opened in a large field straddling the edge of a bog. Seven small burnt stone spreads were excavated; none were associated with troughs or hearths. Radiocarbon dates from the burnt stone spreads indicate activity in the late Neolithic/early Bronze Age and also in the late Bronze Age. A post-medieval field boundary ditch was also investigated.

Monuments identified: Seven prehistoric burnt stone spreads and a post-medieval ditch

Location and reference of archive: The primary records (written, drawn and photographic) are currently held at TVAS Ireland Ltd, Ahish, Ballinruan, Crusheen, Co. Clare.

Report edited/checked by: Graham Hull ✓14.08.06

N18 Ennis Bypass and N85 Western Relief Road, Site AR127, Cahircalla More, Co. Clare
A Final Archaeological Excavation Report

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Report J04/02t

Introduction

This report documents the final results of an archaeological excavation of seven prehistoric burnt stone spreads and a post-medieval ditch (Site AR127) on the route of the N18 Ennis Bypass and N85 Western Relief Road at Cahircalla More, Co. Clare (NGR 132700 175500) (Fig. 1). The excavation forms part of the Ennis Bypass Archaeological Contract 7.

A preliminary archaeological report for this site was produced in May 2004 (Taylor 2004)

The National Monuments Act 1930 (as amended) provides the legislative framework within which archaeological excavation can take place and the following government publications set out many of the procedures relating to planning/development and archaeology:

Framework and Principles for the Protection of the Archaeological Heritage (DAHGI 1999a)

Policy and Guidelines on Archaeological Excavation (DAHGI 1999b)

Code of Practice between the National Roads Authority and the Minister for Arts, Heritage, Gaeltacht and the Islands (NRA/MAHGI 2001)

Project background

As part of the National Roads Authority scheme for upgrading the N18 Limerick to Galway Road, Clare County Council, in consultation with NRA Project Archaeologist Sébastien Joubert, requested a series of archaeological investigations along the route of the proposed Ennis Bypass and a Western Relief Road. The proposed scheme has an overall length of 21km and involves the construction of a 13.8km eastern bypass of Ennis from Latoon, north of Newmarket-on-Fergus, to Cragard, north of Barefield. The Western Relief Road is 7.1km long and is to link Killow and Claureen (Fig. 1).

A number of sites of archaeological interest were known to lie on the route of the new roads and the mitigation strategy agreed by the Project Archaeologist and the national licensing authorities for these sites was preservation by record, i.e. full archaeological excavation. Further sites, without surface expression, were located as the result of intensive test trenching along the course of the road (03E1291 Hull 2003 and 03E1293 Roger 2004). As preservation *in situ* was not a reasonable option, the resolution strategy for these new sites was also preservation by record.

The archaeological excavation and post excavation work were funded by Clare County Council through the National Roads Authority and part-financed by the European Union under the National Development Plan 2000-2006.

Location, topography and geology

The site was located in the townland of Cahircalla More, parish of Drumcliff, barony of Islands and was centred on NGR 132700 175500 (Fig. 1). The excavation comprised eight small open areas targeted on previously identified archaeological deposits. These trenches were spread across several amalgamated fields immediately to the east of the N68 Ennis to Kilrush road (Fig. 2). The fields

encompassed a bog, bounded by a stream at the east, and drier land rising gently to the west (Plate 1). The bog is extremely wet and floods frequently during the winter months - this was experienced on occasion during excavation. At the time of the excavation the land was used as rough pasture.

The topsoil on the dry higher ground at the west was a mid brown clayey loam, 0.20m thick, which overlay up to 0.30m of ploughsoil. In this area (in which Excavation Trench vi was located) the underlying geological deposits were a mid orange sandy clay overlying a pinkish clay with frequent limestone boulders and occasional sandstone cobbles. The nature of this dry land was distinct from the remainder of the field, being more similar to the field to the west of the road, examined by Site AR128 (04E0029 Taylor 2006a).

The bog that occupied the eastern majority of the field was examined in test trenches (03E1291 Hull 2003) and was shown to be deepest adjacent to the stream where it was in excess of 3m deep. The typical stratigraphy of the bog was 0.2m to 0.3m of peaty topsoil overlying 0.2m to 0.3m of alluvium. The alluvium overlay peat and, where this peat was bottomed, this was sitting on cream coloured fine clay. The natural geology at the bog edges was shown to be gravely clay. Of the excavation areas, Trenches ii and viii straddled the edge of the bog, but Trenches i, iii, iv, v and vii were located in the bog with the archaeological deposits sandwiched between layers of peat and alluvium.

The ground surface sloped from approximately 12m above Ordnance Datum (OD) at the west to 9m OD in the bog at the south and east. Reduced levels for each excavation trench are indicated on Figures 3-10.

Archaeological and historical background

As part of the environmental assessment process for the road scheme, Clare County Council commissioned desk-based and walkover surveys that formed part of an Environmental Statement (Babtie Pettit 2000) and an archaeological study for the Environmental Impact Statement (Doyle 1999). A total of 36 sites of known or potential cultural heritage significance were identified along the entire route of the proposed Ennis Bypass and Western Relief Road.

Earthwork and geophysical survey were undertaken on potential archaeological sites and invasive testing and excavation took place in 2002 and 2003 on some of the above ground sites affected by the proposed road (Aegis 2002, IAC 2003, Geoquest 2002, Earthsound 2003).

A systematic programme of testing along the new road route, involving the mechanical excavation of a central linear trench with offsets, took place in Summer/Autumn 2003. Twenty-two previously unknown sites, including cremation cemeteries, burnt spreads, enclosures and brick clamps were found (03E1291 Hull 2003 and 03E1293 Roger 2004). Monuments dating from the Bronze Age to the modern period were found.

Earlier phases of archaeological intervention on newly constructed stretches of the N18 (Dromoland to Carrigoran), to the immediate south of this road project, have demonstrated that the locality has a rich range of prehistoric and later monuments (99E0350 Hull and Tarbett-Buckley 2001).

Recent archaeological work on the BGE Gas Pipeline to the West in the neighbourhood of the new road route has tended to support the picture of continuous human activity in Co. Clare from the Neolithic and even becoming intensive from the Bronze Age. A number of burnt spreads and burnt mounds were excavated near the route of the new road in the summer of 2002 (MGL 2002).

Two other sites were excavated nearby as part of the Ennis Bypass road project:

AR126 (04E0024, Hull 2006a) Large *fulacht fiadh* 95m east.
AR128 (04E0029, Taylor 2006a) Early medieval enclosure and field system 40m west.

Earlier test excavations

Archaeological deposits were found at this location during the centre-line and offset testing (03E1291 Hull 2003). The density of trenches was increased in order to enhance the discovery of archaeological sites and eight distinct locations of archaeological material were found. These areas were the focus of the eight excavation trenches described in this report.

Seven discrete and amorphous deposits of burnt stones were found, either immediately below the alluvium, or above the older peat, or at the edge of the bog. These burnt stone spreads characteristically ranged in thickness from 0.05m to 0.2m thick and covered areas in the order of 10m to 15m across. The heat cracked stone was mostly limestone with occasional sandstone pieces. The spreads were sometimes stained black by charcoal but most were pale coloured as the charcoal had leached out. These spreads were excavated in trenches i-v, vii and viii.

Three ditch lengths were examined at the west of the field adjacent to the road. Although it was thought that these might have represented fairly modern agricultural activity, the presence of the ditched enclosure (AR128 Taylor 2006a) 40m to the west suggested that they might possibly be of similar antiquity.

Excavation aims and methodology

A licence to excavate was granted to Kate Taylor by the National Monuments Section of the Department of the Environment, Heritage and Local Government, in consultation with the National Museum of Ireland, on behalf of the Minister for the Environment, Heritage and Local Government. The licence number is 04E0028.

The aims of the excavation were to:

1) Preserve by record all archaeological deposits and features within the excavation area
2) Produce a high quality report of the findings

The fieldwork took place between the 28th of January and the 12th of February 2004 and the author was assisted by Connor Conroy, Lewis Goodman, Graham Hull, Aine Kelly, Fiona McAuliffe, Michael Parks, Edel Ruttle and Alan Smart.

Eight excavation areas, targeted on deposits encountered during earlier testing, were dug. These excavation areas were numbered i – viii and all but Area vi were focussed on small burnt stone spreads. Area vi examined the ditch adjacent to the Kilrush Road. This ditch proved to extend beyond the original limits of Area vi and the excavation area was therefore extended. A number of additional small trenches were also placed along the line of the feature in order to ascertain its extent. The total excavated area of AR127 was 5108m^2.

Topsoil and overburden were removed by a 13 tonne, 360º wide-tracked machine fitted with a toothless grading bucket operated under direct and continuous archaeological supervision. The spoil was visually scanned for artefacts.

Where appropriate, areas within the excavation areas were cleaned using hand tools to fully define the limits of the potential archaeological features. Slots were dug to investigate all possible features and deposits and those that proved to be of archaeological interest were fully excavated.

A full written, drawn and photographic record was made according to the TVAS Ireland Field Recording Manual (First Edition 2003). The site was planned using a combination of digital and hand drawing methods. Digital plans were made using a Global Positioning System (GPS) unit, tied into the N18 surveying base station to provide millimetre accuracy.

Excavation results (Figs 2-10 and Plates 1-14)

The excavation revealed evidence of at least four phases of activity ranging in date from the late Neolithic/early Bronze Age to the 19th or 20th century. All features and contexts are listed in Appendix 1.

Late Neolithic / early Bronze Age

Six burnt stone spreads are assigned to this phase on the basis of radiocarbon determinations covering a period from 2470-1700 Cal BC. All of the spreads were small and none was associated with cut features such as troughs.

Area i (Fig. 3, Plates 2 and 9)
Deposit 1 formed two small amorphous and insubstantial spreads of burnt stone material measuring 9.5m by 6.8m and 3.7m by 1.9m (49.3m^2). The deposits were less than 0.05m thick and the volume of material was approximately 2m^3. The spread was located below 0.4m of scraw and peat and overlay alluvium and peat deposits. The heat-altered stone was dominated by limestone, with sandstone being in the minority. A small amount of charcoal was also present within the deposit. A 2 sigma radiocarbon determination of 2470-2210 Cal BC was obtained.

Area iii (Fig. 5, Plate 4)
Deposit 3 was sandwiched between peat layers, beneath 0.4m of peat and 0.1m of scraw. The spread measured 9.3m by 7.3m (44.0m^2) and was up to 0.1m thick (approximate volume of 4m^3). The excavation was hampered by severe flooding that affected the three trenches at the north-east of the field (areas iii, iv and v). A 2 sigma radiocarbon determination of 1910-1700 Cal BC was obtained.

Area iv (Fig. 6, Plates 5 and 11)
Deposit 4 was the smallest of the burnt stone spreads excavated, measuring 3.0m by 2.0m (5.3m^2) and was up to 0.10m thick (approximate volume of 0.5m^3). The deposit had been truncated during testing and little survived, however it was probably not substantially larger before this truncation. A 2 sigma radiocarbon determination of 2450-2190 and 2170-2150 Cal BC was obtained.

Area v (Fig. 7, Plate 12)
Deposit 5 was the northernmost of the excavated spreads, was located beneath 0.3m of peat and 0.2m of scraw and sat above peat deposits. The spread measured 11.2m by 6.7m (61.2m^2) and was up to 0.1m thick (total volume approximately 6m^3). A 2 sigma radiocarbon determination of 2330-2130 and 2080-2060 Cal BC was obtained.

Area vii (Fig. 8, Plates 6 and 13)
Deposit 7 was located at the southern end of the field, some distance from the dry ground, beneath 0.3m peaty alluvium and 0.1m of scraw and above peat deposits. The spread measured 7.0m by 5.0m (31.2m^2) and was 0.1-0.2m thick with an approximate volume of 4m^3. A 2 sigma radiocarbon determination of 2290-2040 Cal BC was obtained.

Area viii (Fig. 9, Plates 7 and 8)
Deposit 8 was the largest of the burnt stone spreads, measuring 13.3m by 8.9m (87.4m^2). The spread was up to 0.1m thick and the approximate volume of material was 8m^3. The deposit was located close to the edge of the bog beneath 0.3m of scraw and overlay alluvial silts. A 2 sigma radiocarbon determination of 2020-1770 Cal BC was obtained.

Late Bronze Age

One of the seven burnt stone spreads is assigned to this phase on the basis of a radiocarbon date.

Area ii (Fig. 4, Plates 3 and 10)
Deposit 2 lay on drier ground than the other burnt stone spreads and directly overlay natural gravel deposits and was overlain in turn by 0.3m of peaty alluvium and 0.2m of scraw. The deposit formed an amorphous spread of burnt stone measuring 8.4m by 5.6m (43.3m^2) and was 0.1-0.2m thick (total volume approximately 6m^3). In common with the other burnt stone spreads on the site, the majority of the heat-affected stone was limestone with a smaller amount of sandstone present along with a small amount of charcoal. A 2 sigma radiocarbon determination of 1100-900 Cal BC was obtained

Post-medieval (Fig. 10, Plate 14)

The ditch investigated in Area vi is dated to the late post-medieval period on the basis of a single small sherd of pottery. Ditch 10 was revealed for a length of 54m within the main trench of Area vi and, where it was located in further trenches to the north-east, could be seen to extend for at least another 34m. The ditch followed an irregular curving path and may possibly have been mirroring the edge of the bog to its east. Eleven slots were excavated through the ditch, in addition to those dug during the testing. The ditch generally had a 'U'-shaped profile with largely sterile fills, although charcoal was observed in a few locations.

Later post-medieval (Fig. 10)

A series of cultivation furrows was revealed in Area vi; these were seen to truncate ditch 10. Similar features were also observed during the test trenching of the dry land at the west of the field. It would appear that this land was ploughed or hand cultivated after ditch 10 was infilled. No dating evidence was recovered from these shallow features, however the stratigraphic relationship indicates a 19th or 20th century date for this activity.

A single small pit (16) was excavated in Area vi. This oval feature measured 0.69m by 0.48m and was 0.06m deep. The fills of the pit were charcoal rich and oxidised clay provided evidence of *in situ* burning. Although no dating evidence was recovered from the pit it appeared to be cut from within the plough soil and was therefore of a fairly late date and, presumably, later than the cultivation furrows.

Finds

A single artefact, a sherd of pottery, was recovered during the excavation, from one of the slots through ditch 10 in Area vi (Appendix 2).

The finds have been cleaned, numbered, labelled, properly packed and will be deposited with the National Museum of Ireland in accordance with *Advice Notes for Excavators* (NMI 1997).

Pottery by Kate Taylor

The single find (04E0028:1) is a small sherd of white glazed pottery with a painted blue line decoration and probably dates to the late 18th century or 19th century.

Samples

Bulk soil samples were taken from nine contexts across the site (Appendix 3). Seven of these samples have been floated and wet sieved through a 300micron mesh and then through a 2mm mesh in order to recover charred plant material and small artefacts. Heat-affected stone from many of the burnt stone spreads has been retained.

Identification of stone samples by Dr Martin Feely

Introduction

TVAS delivered six plastic bags containing between four and six stone samples taken from three deposits from AR122, a burnt spread site. A total of 31 stone samples were identified using a Nikon incident light binocular microscope. Each stone sample in each sample bag has been given a letter and the description of each stone is matched below to that letter.

Results

Table 1: Rock types
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Cut	Deposit	Sample	Identification
-	1	1	5 stones: a) Medium grained grey sandstone b) Medium grained grey micaceous sandstone c) Medium grained grey micaceous sandstone d) Medium grained grey micaceous sandstone e) Medium grained quartz rich rock. Visible feldspar crystals and dark flecks of mica suggest an igneous origin
-	2	2	4 stones: a) Fossiliferous carboniferous limestone with crinoidal fragments visible b) Medium grained sandstone c) Fine grained mudstone d) Medium grained sandstone
-	3	3	6 stones: a) Medium grained sandstone b) Medium grained sandstone c) Medium grained sandstone d) Medium grained sandstone e) fine grained micaceous sandstone f) Fine grained well formed interlocking quartz crystals. Probably formed originally as a vein or vug (cavity). Very different to other samples from this site.
-	4	4	6 stones: a) medium grained sandstone with thin (2mm) vein of milky quartz b) Fine grained micaceous sandstone c) Medium grained sandstone d) Medium grained micaceous sandstone e) Medium grained sandstone f) Medium grained sandstone
-	5	5	5 stones: a) Medium grained micaceous sandstone b) Medium grained micaceous sandstone c) Medium grained micaceous sandstone d) Fossiliferous siltstone e) Milky quartz probably formed in a quartz vein
-	7	7	5 stones: a) Medium grained sandstone b) Medium grained sandstone c) Medium grained sandstone d) Medium grained sandstone e) Fine grained siltstone

Fragmentation of stones

I see nothing exceptional about the stone samples and the average size of each stone is quite small < 10 cm to pebble size. They represent material I would expect to encounter in glacial debris. I cannot say that they are smaller fragments of larger heated stones dropped into cold water.

Discussion

In general the stone samples from the Ennis Bypass are either sandstone or limestone. The sandstones are of three main types: a common sandstone, a micaceous variety which has visible "shiny" flakes mica and finally a pebbly variety like a fine conglomerate. The limestone samples all have visible fossiliferous material similar to that found in the Lower Carboniferous limestones of Ireland.

Additional "stone" varieties include fragments of the mineral calcite, quartz and fine grained igneous rocks. The sandstone samples most likely represent Devonian sandstones while there is little doubt that the limestone is Lower Carboniferous in age. This is not surprising as both geological periods are represented by rock exposures in the west and southwest of the country. Glacial debris commonly contains disaggregated blocks of both rock types. The fragments of calcite and quartz probably formed part of geological structures termed veins, which transect existing rocks. The igneous varieties may represent samples of Carboniferous volcanic rocks but this is speculative.

Charred plant macrofossils and other remains by Val Fryer

Introduction

Samples for the extraction of the plant macrofossil assemblages were taken from seven burnt stone areas

Methods

The samples were floated and wet sieved by TVAS Ireland Ltd, and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16, and the plant macrofossils and other remains noted are listed below on Table 2. Nomenclature within the table follows Stace (1997). All plant remains were charred. The density of material within each assemblage is expressed in the table as follows: x = 1 – 10 specimens, xx = 10 – 100 specimens and xxx = 100+ specimens.

Un-charred wood fragments were noted in samples 3 and 4, and the latter sample was also heavily contaminated with possible modern root/stem.

Results

Plant macrofossils

Charcoal fragments formed the principal component of all seven assemblages, and it is possibly of note that pieces in sample 1 were noticeably rounded and abraded. Hazel (*Corylus avellana*) nutshell fragments were noted in samples 2, 3 and 8. All were removed for potential C14 analysis, although the quantity from sample 2 may be insufficient for an accurate determination.

Other materials

Mineralised soil concretions were abundant in samples 2, 3, 4, 5 and 8, and possible small fragments of heavily burnt peat were also noted in samples 3, 4 and 5. Rare pieces of burnt stone were recorded from samples 3 and 8.

Table 2: Charred plant macrofossils and other remains

Sample No	1	2	3	4	5	7	8
Deposit No	1	2	3	4	5	7	8
Corylus avellana L.		xcf	x				x
Charcoal <2mm	x	x	xx	xx	xxx	x	xxx
Charcoal >2mm	xx	xx	xxx	xxx	xxx	xxx	xxx
Charred root/stem		x					
?Heavily burnt peat fragments			x	x	x		
Burnt stone			x				x
Mineralised soil concretions		xxx	x	x	x		xxx
Small coal fragments			x				
Sample volume (litres)	8	8	8	8	10	8	7
Volume of flot (litres)	<0.1	0.1	0.6	0.1	0.5	0.4	0.1
% flot sorted	100%	100%	25%	100%	25%	25%	100%

Conclusions

Hazel nutshell fragments have been noted within charcoal rich deposits from *fulachta fiadh* in County Clare (Penny Johnston, pers. comm.), where it is assumed they were accidental inclusions within the fuel residues from the heating processes.

Charcoal by Simon Gannon

Introduction

Seven samples of charcoal fragments were retrieved from seven contexts from the site, all were burnt spreads. Identification of taxa of the retrieved charcoal may assist in the reconstruction of the local, contemporary woodland-environment and the use of the woodland resources by the people responsible for the archaeological features.

Methodology

In sorting fragments suitable for identification a guide size of at least 2mm in radial cross-section was used. In this sort some samples were found to contain an unusually large number of fragments and sub-samples were taken, as detailed in Analysis Results.

Initially the grain direction of the fragments was identified before fracturing across their transverse plains. Identifications were made under microscopic examination, in most cases. Further fractures were made to reveal radial and/or tangential plains in cases where identification was more difficult. Magnification of between x10 (hand lens) to x400 was used. Structural elements of the fragments were examined to allow for identification of roundwood, heartwood, and sapwood features.

Reference material comprised a reference collection of charred samples of taxa and reference publications, *Microscopic Wood Anatomy* (Schweingruber 1990) and *The Identification of the Northern European Woods* (Hather 2000).

Analysis Results

The results are summarized in Table 3. Classification follows that of *Flora Europae* (Tutin *et al*. 1964-1980). Certain related taxa cannot be securely differentiated on the basis of their anatomical characteristics and are assigned to their respective family groups as with the genera *Salix* and *Populus*, and the genera *Craetaegus*, *Malus* and *Sorbus*. Provisional identifications have been given in cases where the condition of the charcoal was degraded.

The various identifications of wood taxa were consistent with taxa from the following groups:

Broadleaf taxa
Betulaceae. *Alnus* sp., alder.
Corylaceae. *Corylus* sp., hazel.
Fagaceae. *Quercus* sp., oak.
Oleaeceae. *Fraxinus* sp., ash.
Rosaceae.
Subfamily Pomoideae. *Craetagus* sp., hawthorn; *Malus* sp., apple; *Sorbus* spp., *Sorbus aucuparia*, rowan; *S. aria*, whitebeam; *S. hibernica*, Irish whitebeam, and other *Sorbus* species.
Prunus sp., *Prunus avium*, wild cherry; *P. spinosa*, blackthorn; *P. padus*, bird cherry.
Rosa sp., rose.
Ulmaceae. *Ulmus* sp., elm.

Coniferous taxa
Cupressaceae. *Taxus* sp. yew.

Table 3: Number of identified fragments per sample

Sample	Deposit	Context type	*Alnus*	*Betula*	*Corylus*	*Corylus/ Alnus*	*Fraxinus*	*Pomoideae*	*Prunus*	*Quercus*	*Salicaceae*	*Taxus*	*Ulmus*
1	1	Burnt spread	1 (1r)	-	7	7	4	1	-	-	-	-	-
2	2	Burnt spread	-	-	-	11	7	3	-	-	-	-	-
3	3	Burnt spread	1	-	13	14	71	-	-	2	-	-	-
4	4	Burnt spread	-	-	-	2	3	-	-	-	-	3	-
5	5	Burnt spread	-	-	-	5	74	2	-	-	-	19	-
7	7	Burnt spread	-	-	-	12	13	-	-	-	-	1	1
8	8	Burnt spread	-	-	7	-	8	-	-	1	-	-	-

(r: roundwood)

Discussion

Anatomical characteristics from charcoal fragments do not allow for identification of individual species in every case. Several species belong to groups of species, species of genera, of sub-families and of families that cannot be separated anatomically (Schweingruber 1990, Hather 2000). It is possible that a narrow range of species and, occasionally, one or two species can be indicated with a degree of confidence due to established factors, principally their native status and history of introduction by people (Huntley and Birks 1983, Peterken 1996 and Scannell and Synott 1987). The following section places the given charcoal based taxa identifications in the context of defined tree species allowing for implications related to their environmental characteristics and possible use by ancient peoples to be drawn. Consulted reference works pertaining to environmental factors included Goldstein *et al* 1984, Hather 2000, Huntley and Birks 1983, Mitchell 1978, Scannell and Synott 1987 and Tutin *et al* 1964-1980. Kelly 1998, O'Sullivan 1996, Rackham 1976-1990 and Raftery 1996, were consulted in relation to the uses different tree species may have served in antiquity.

Taxa descriptions

Alder

The sole native species is *Alnus glutinosa*, Common Alder, Irish fearnóg (family – Betulaceae).
Environment indications. Tolerant of nearly all soil types including relatively infertile soils, such as ironpan and peaty soils. Particularly tolerant of water logged conditions and is often a streamside tree. Has the ability to 'pioneer' into previously disturbed land. Native distribution throughout Ireland.
Uses in antiquity. A hardwood suitable for a variety of artefacts and smaller structural timber. Tends to harden when in contact with water and therefore suitable for making piles etcetera. It burns quickly when used for firewood but has been found suitable for charcoal production.

Hazel

There is a single native species, *Corylus avellana*, hazel, coll (family - Corylaceae).
Environmental indications. Botanically a shrub, but does not flower and fruit without sunlight, so is really a canopy tree preferring woodland edges and clearings though it bears moderate shade and is also found as understorey, typically in oak woodlands. Fairly tolerant of poor soils but does not grow on acid soils and preferring chalky, fertile, deep soil. Growing throughout Ireland.
Uses in antiquity. A tough and flexible wood, useful for small implements and small structural elements. Also grows easily in coppice-like form producing rods suitable for wattle and basketry type structures. Makes useful firewood.

Ash

There is a single native species, *Fraxinus excelsior*, ash, fuinseog (family - Oleaceae).
Environmental indications. Requiring deep, fertile, moist but well drained, soils. Grows well in mixed stands when not shaded. Widespread throughout Ireland.
Uses in antiquity. A strong but elastic wood suitable for many purposes including structural timber (not where in prolonged contact with water or soil). Coppices readily. Burns well even when green, partly due to low water content.

Hawthorn/ *Sorbus*

The represented species is probably one or more of the following native members of the sub-family Pomoideae that includes several *Sorbus* species. (Family - Rosaceae).

Crab Apple, *Malus sylvestris*, cran fia-úll; hawthorn, *Crataegus monogyna*, sceach geal.

Environmental indications. Both species. Very rugged and adaptable to almost any climate and most soil types, requiring moist soil and can grow in semi-shade or no shade. Natural distribution throughout Ireland.
Uses in antiquity. Both species produce a very hard close grained wood, suitable for small implements such as mallets and splitting wedges. Both species make excellent fuel; *C. monogyna* can also make livestock barriers and is noted for being the hottest firewood.

Sorbus. One or more of the native group of at least six species that includes, the most widespread rowan, *Sorbus aucuparia*, caorthann, as well as whitebeam, *Sorbus aria*, fionncholl coiteann; and Irish whitebeam, *Sorbus hibernica*, fionncholl ghaelach.
Environmental indications. General. Very tolerant of soil quality generally, though requiring moist soil. Tolerating light shade, though fruiting better in a sunny position. Effective pioneer, Rowan natural to all of Ireland. Other *Sorbus* species native to Ireland have a much more restricted range within Ireland and elsewhere, with Irish whitebeam found only in Ireland.
Uses in antiquity. Heavy, close grained hard wood suitable for carving and useful for making bows, tool handles, mallet heads and, if sizable, beams etcetera. Coppices well.

Oak

There are two native species, pedunculate oak, *Quercus robur*, dair ghallda and sessile oak, *Quercus petraea*, dair ghaelach. (Family - Fagaceae).
Environmental indications. Broadly soil tolerant. *Q. robur* preferring alkaline or neutral soils rich in minerals, particularly damp clay soils and usually found in mixed woodland. *Q. petraea* preferring acid and lighter well drained soils, often in pure stands. Both species are naturally distributed throughout Ireland.
Uses in antiquity. Both species produce a hard wood resistant to abrasion and water degradation, particularly useful for structural timber and implements, poles and fencing. Woodland trees can be coppiced to produce stakes, straight poles etcetera. The density of oak wood makes for an optimum long lasting fire fuel (Rossen and Olson 1985).

Yew

The native species is yew, *Taxus* baccata, iúr (family - Taxaceae).
Environmental indications. Growing on limestone and chalk in woods and scrub, often occurring in dense shade of oak woods. Also can form pure stands in sheltered sites. Natural distribution throughout Ireland.
Uses in antiquity. A heavy, hard, durable, and elastic wood, resistant to water. Useful for structures, bows, tool handles etc. Makes good firewood.

Elm

The sole native species is *Ulmus glabra*, wych elm, leamhán sléibhe (family-Ulmaceae).
Environmental indications. Generally requiring non-calcareous top soil, can grow in heavy clay soil, needing moist but not waterlogged ground. Distribution throughout Ireland. Moderately shade tolerant.
Uses in antiquity. A hard, elastic, wood which is durable under water. Useful as structural timber, implements etcetera. Responds well to coppicing. The inner bark fibre can be used for ropes, mats etc.

The total range of taxa from AR127, Cahircalla More, comprises alder (*Alnus*), hazel (*Corylus*), ash (*Fraxinus*), hawthorn/apple/*Sorbus*-group (Pomoideae), oak (*Quercus*), yew (*Taxus*) and elm (*Ulmus*). The represented taxa belong to the groups of species represented in the native Irish flora and, conversely, non-native tree species such as lime (*Tilia*) and beech (*Fagus*) are not represented.

Generally, there are various, largely unquantifiable, factors that effect the representation of species in charcoal samples including bias in contemporary collection, inclusive of social and economic factors, and various factors of taphonomy and conservation (Schweingruber 1990). On account of these

considerations the identified taxa are not considered to be proportionately representative of the availability of wood resources in the environment in a definitive sense and are possibly reflective of particular choice of fire making fuel from those resources.

Ash (*Fraxinus*) is the most numerous of the identified taxa at this site and is the second most commonly represented charcoal from the total of Ennis Bypass sites. As noted above, ash (*Fraxinus*) is a particularly useful fire fuel as well as being a likely commonly used structural/artefactual wood that may have had subsequent use as fire fuel. In regard to the relatedness of the different burnt deposits there is a degree of consistency in their prevalence of fragments of ash (*Fraxinus*) and hazel (*Corylus*) as well as the absence of some taxa, including cherry/blackthorn (*Prunus*) and willow/poplar (Salicaceae).

Conclusion

The identified taxa are broadly consistent with the picture of wood use from the other Ennis Bypass sites. The charcoal of the site has probably derived from fire debris, and a particularly ready access to, and possible preference for ash (*Fraxinus*) as fire fuel is indicated.

Radiocarbon dates

Seven radiocarbon determinations from charcoal from each of the burnt stone deposits were made by Beta Analytic Inc, Miami, Florida (Table 4).

Table 4: Radiocarbon determinations

Sample material	Cut	Deposit	Sample	Lab code	Radiometric age	Calendrical calibrations
Charcoal Corylus shell	-	1	1	Beta-211566	3870±40 BP	2 sigma (95%) Cal BC 2470 to 2210 1 sigma (68%) Cal BC 2450 to 2290
Charcoal Corylus	-	2	2	Beta-211567	2830±40 BP	2 sigma (95%) Cal BC 1100 to 900 1 sigma (68%) Cal BC 1020 to 920
Charcoal Corylus shell	-	3	3	Beta-207735	3490±40 BP	2 sigma (95%) Cal BC 1910 to1700 1 sigma (68%) Cal BC 1880 to 1750
Charcoal Corylus	-	4	4	Beta-211568	3840±40 BP	2 sigma (95%) Cal BC 2450 to 2190 and Cal BC 2170 to 2150 1 sigma (68%) Cal BC 2340 to 2210
Charcoal Fraxinus	-	5	5	Beta-207731	3790±40 BP	2 sigma (95%) Cal BC 2330 to 2130 and Cal BC 2080 to 2060 1 sigma (68%) Cal BC 2290 to 2140
Charcoal Corylus	-	7	7	Beta-211569	3760±40 BP	2 sigma (95%) Cal BC 2290 to 2040 1 sigma (68%) Cal BC 2210 to 2130
Charcoal Corylus shell	-	8	8	Beta-211570	3570±40 BP	2 sigma (95%) Cal BC 2020 to 1770 1 sigma (68%) Cal BC 1950 to 1880

The charcoal was from relatively short-lived tree species and hazelnut shells and therefore the radiocarbon determinations are reasonably indicative of the dates of deposition of the burnt stone. The radiocarbon information is shown on Figure 2, and shows that the burnt stone spreads were constructed between the late Neolithic and the late Bronze Age.

Discussion

The excavation of site AR127 at Cahircalla More, Co. Clare has revealed evidence of seven prehistoric burnt stone deposits and of a later post-medieval ditch.

Prehistoric

Six of these burnt stone spreads were dated to the period between 2470 and 1700 BC and the seventh to the period 1100 to 900 BC.

The seven small discrete burnt stone spreads were investigated at the edge of and close to the surface of a peat bog. All the spreads were similarly composed, thin deposits and there was no evidence of hearths or of cut features such as troughs. The low-lying site location and the presence of alluvial silts both above and below several of the stone deposits suggest that the use of the sites may have been seasonal, with the bog being flooded in the winter months. The small volume of material in each spread indicates a short period of use, perhaps even single episodes.

Site AR126 (0E0024, Hull 2006a) was a well preserved, 'classic' crescentic-shaped *fulacht fiadh* with an associated trough and was located within 220m to the east and south of the AR127 burnt stone spreads. The AR126 *fulacht fiadh* had seemingly undergone if not a change in use, a change in status and three phases of deposition of burnt stone, separated by two periods of inactivity were apparent. At the very end of the Neolithic period, between 2550 and 2300 BC, the earliest layer of burnt stone, 0.15m thick and approximately 4m across, and composed exclusively of sandstone, was deposited onto the surface of the natural geology. This burnt stone deposit was very similar to the AR127 deposits.

Four other deposits of charcoal-rich, burnt stone were found 2km to the east as part of this road project:

Site AR121 (04E0031 Taylor 2006b) was characterised by a spread of burnt stone with no cut features such as troughs. A radiocarbon date from Site AR121 indicates that stone was heated in the later Bronze Age (2 sigma Cal BC 1000 to 820).

Site AR122 (04E0032 Taylor 2006c) was characterised by burnt stone deposits and small pits or troughs. Two radiocarbon dates from Site AR122 indicate that heated stone was used to warm water there in the late Neolithic and early Bronze Age (2 sigma Cal BC 2430 to 2140 and Cal BC 1870 to 1630).

Site AR124 (04E0022 Hull 2006b) part of a burnt stone mound and a trough were excavated. The stone-filled trough from that site was radiocarbon dated to the early Bronze Age (2 sigma Cal BC 2200 to 1960).

AR125 (04E0023 Hull 2006c) a burnt stone deposit, similar to those described above was destroyed by construction contractors and has not been dated.

These four sites (AR121, 122, 124 and 125) are located on the flood plain of the River Fergus and, even though modern river defences have relieved much of the seasonal flooding that must have been associated with the river, are within a very wet and boggy landscape.

The almost exclusive use of sandstone at the thirteen burnt stone spreads (including the early phase of the *fulacht fiadh* AR126) is significant, as the later deposits that became the AR126 *fulacht fiadh* were predominantly limestone. It is very likely then, that sandstone was gathered from the glacial debris in the late Neolithic/early Bronze Age and that this resource was exhausted by the later Bronze Age, at least locally, and substituted as a heating medium by more commonly occurring limestone. Another

explanation for the change from sandstone to limestone implies a change in use - sandstone might be a better rock-type if food preparation was the function of the earlier burnt stone sites.

It has been argued that *fulachta fiadh* seem to occur in the proximity of habitation enclosures (Cooney and Grogan 1994) and that these monuments may have formed part of a social 'round', in which individual family groups hosted reciprocal ceremonial activities for the local community (Grogan 2005). The burnt stone spreads from the Ennis Bypass road scheme were found at characteristically wet locations and these ill-defined spreads of stone ranged in size from a metre or two to 15m across and were typically less than 0.1m thick. It is not clear what specific activity the spreads represent; but it is likely that the stone was used to heat water in a similar manner to *fulachta fiadh* with the lack of a trough perhaps indicating that the water was held in a portable container. The shallow burnt stone spreads may perhaps be thought of, in some cases, as precursors to *fulachta fiadh* at which the process of repeated deposition of burnt stone across many years was not continued long enough for the full-blown mound to develop. It is possible that the burnt stone spread of one of these family groups at was 'promoted' to become a much more ostentatious monument (*fulacht fiadh* AR126), perhaps reflecting the centralisation of authority that it is thought took place during the Bronze Age. There are, however, problems with the notion of continuity of site across many centuries. The two phases of burnt stone spread at AR126 were shallow and amorphous and may represent single burning episodes. How would people know where they were after a few generations?

Post-medieval

The post-medieval feature at the west of the site probably represents a field boundary ditch dividing the dry agricultural land from the bog and stream. A land division is indicated in approximately this location on the 1840 Ordnance Survey map and it is likely that the excavated ditch is in fact this feature.

Archaeological potential off the road CPO

The archaeological deposits located during testing were excavated in their entirety within the road CPO. Given the similarly boggy nature of the field outside the road CPO it would not be suprising if more burnt stone spreads are present beneath the scraw outside the road-take.

Publication plan

A summary of the findings of the excavation has been submitted to *Excavations 2004*.

Copies of this final excavation report will be deposited with the Clare County Museum and the Local Studies Library, Ennis, Co. Clare

A summary article, describing the findings of this road project has been published in the local journal *The Other Clare* (Hull and Taylor 2005).

An illustrated information brochure describing the findings of this road project has been published by Clare County Council.

The stated aim of the National Roads Authority with regard to archaeological publication is clear, (O'Sullivan 2003) and it is anticipated that the results of this excavation will be disseminated as a component of a monograph dedicated to the archaeology of the Ennis Bypass. Publication is expected to take place in 2006/7 at the latest.

The radiocarbon dated *fulachta fiadh* and burnt stone spreads excavated as part of this road project and a number of other dated burnt stone sites, excavated by the author and others on the BGE Gas Pipeline

to the West (Grogan forthcoming), on the west bank of the upper Fergus estuary would make an informative article in a national journal and would provide valuable comparative data to supplement the Discovery Programme research programme. It is proposed to discuss this thematic and regional publication with the Project Archaeologist Sébastien Joubert and with Eoin Grogan.

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Kate Taylor MIAI MIFA
TVAS Ireland Ltd
14th August 2006

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Appendix 1: Catalogue of features and deposits

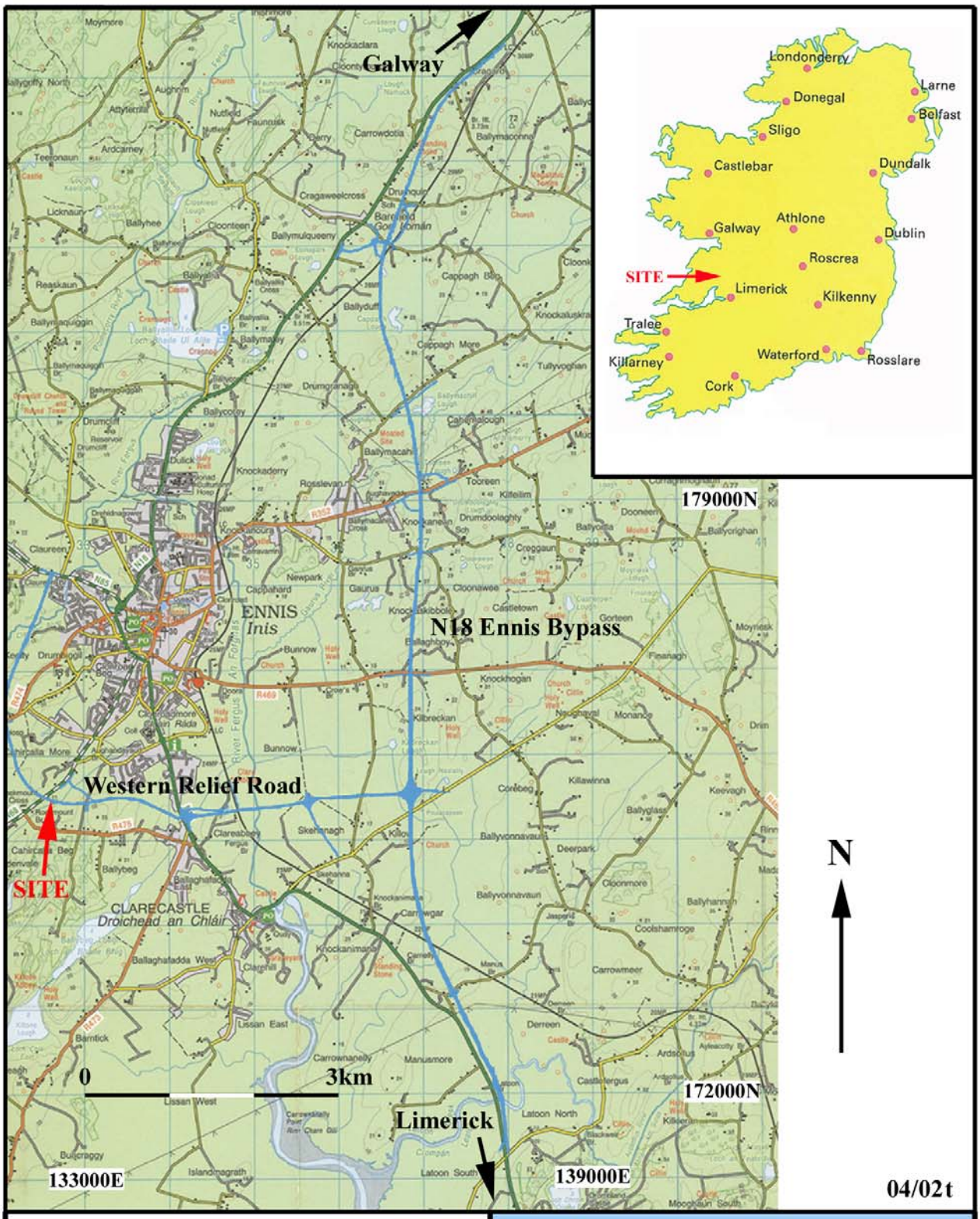
Cut	Deposit(s)	Group Number	Trench	Description	Samples	Finds
-	1	-	i	Burnt stone spread	1	-
-	2	-	ii	Burnt stone spread	2	-
-	3	-	iii	Burnt stone spread	3	-
-	4	-	iv	Burnt stone spread	4	-
-	5	-	v	Burnt stone spread	5	-
-	7	-	vii	Burnt stone spread	7	-
-	8	-	viii	Burnt stone spread	8	-
-	50	-	vi	Topsoil	-	-
6	54, 55	10	vi	Slot through ditch	-	-
9	51, 52,53	10	vi	Slot through ditch	-	-
11	59, 60	10	vi	Slot through ditch	-	-
12	61, 62, 63	10	vi	Slot through ditch	6	-
13	56	10	vi	Slot through ditch	-	-
14	57, 58	10	vi	Slot through ditch	-	-
15	64, 65	10	vi	Slot through ditch	-	-
16	66, 67	-	vi	Pit	9	-
17	68, 69	10	vi	Slot through ditch	-	1 = pottery
18	70, 71	10	vi	Slot through ditch	-	-
19	72, 73	10	vi	Slot through ditch	-	-
20	74, 75	10	vi	Slot through ditch	-	-

Appendix 2: Catalogue of artefacts

Find number	Cut	Deposit	Group number	Category	Description	Number of pieces	Weight (g)
1	17	68	10	Pottery	Sherd of glazed pottery	1	1

Appendix 3: Catalogue of samples

Sample number	Cut	Deposit	Group number	Volume sieved (L)	Volume floated (L)	Stone sample?	Charred plant remains?
1	-	1	-	8	8	Y	Y
2	-	2	-	8	8	Y	Y
3	-	3	-	8	8	Y	Y
4	-	4	-	8	8	Y	Y
5	-	5	-	10	10	Y	Y
6	12	62	10	-	-	-	-
7	-	7	-	8	8	Y	Y
8	-	8	-	7	7	N	Y
9	16	66	-	-	-	-	-



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N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare
04E0028

Figure 1: Site location

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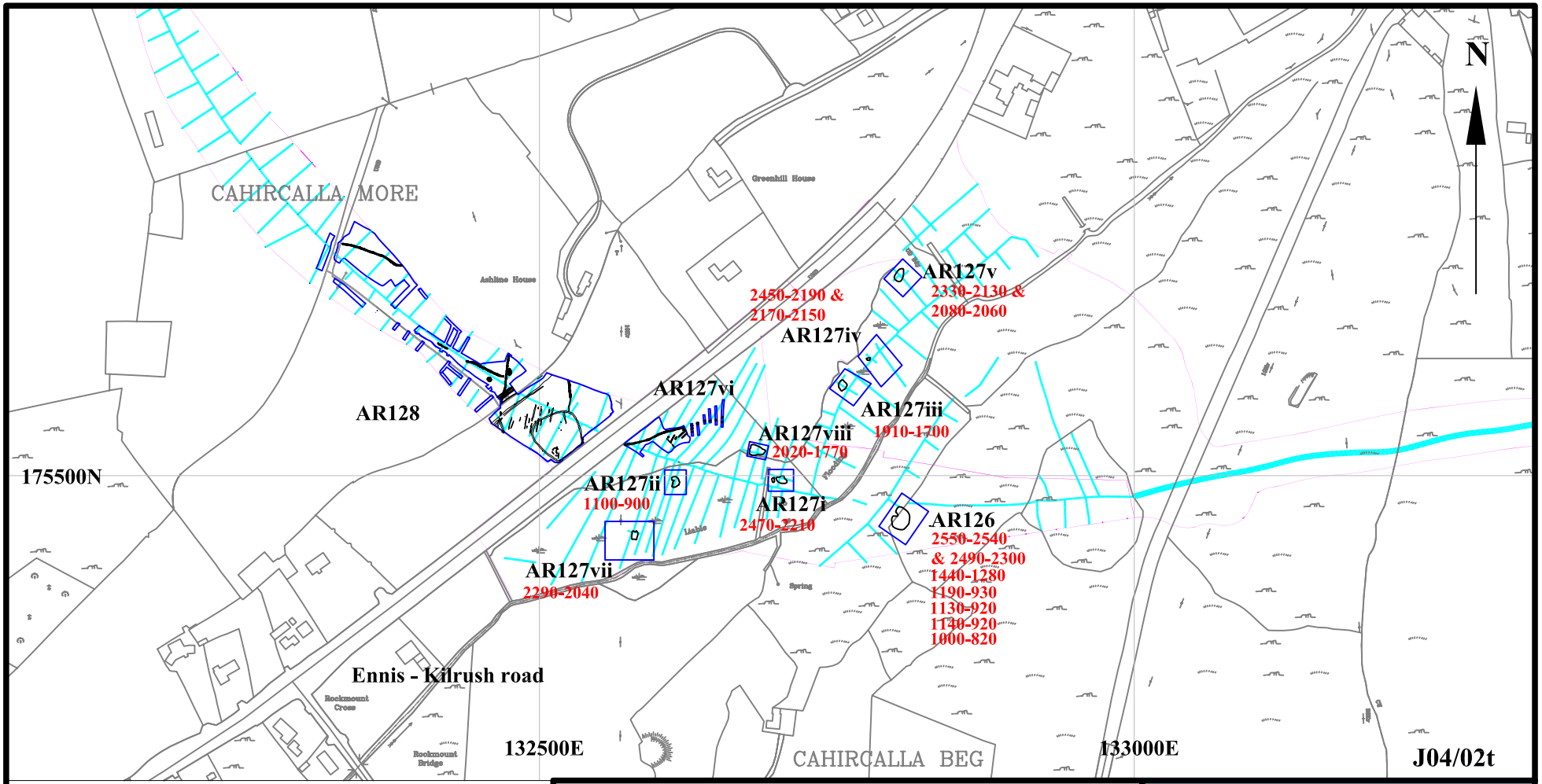


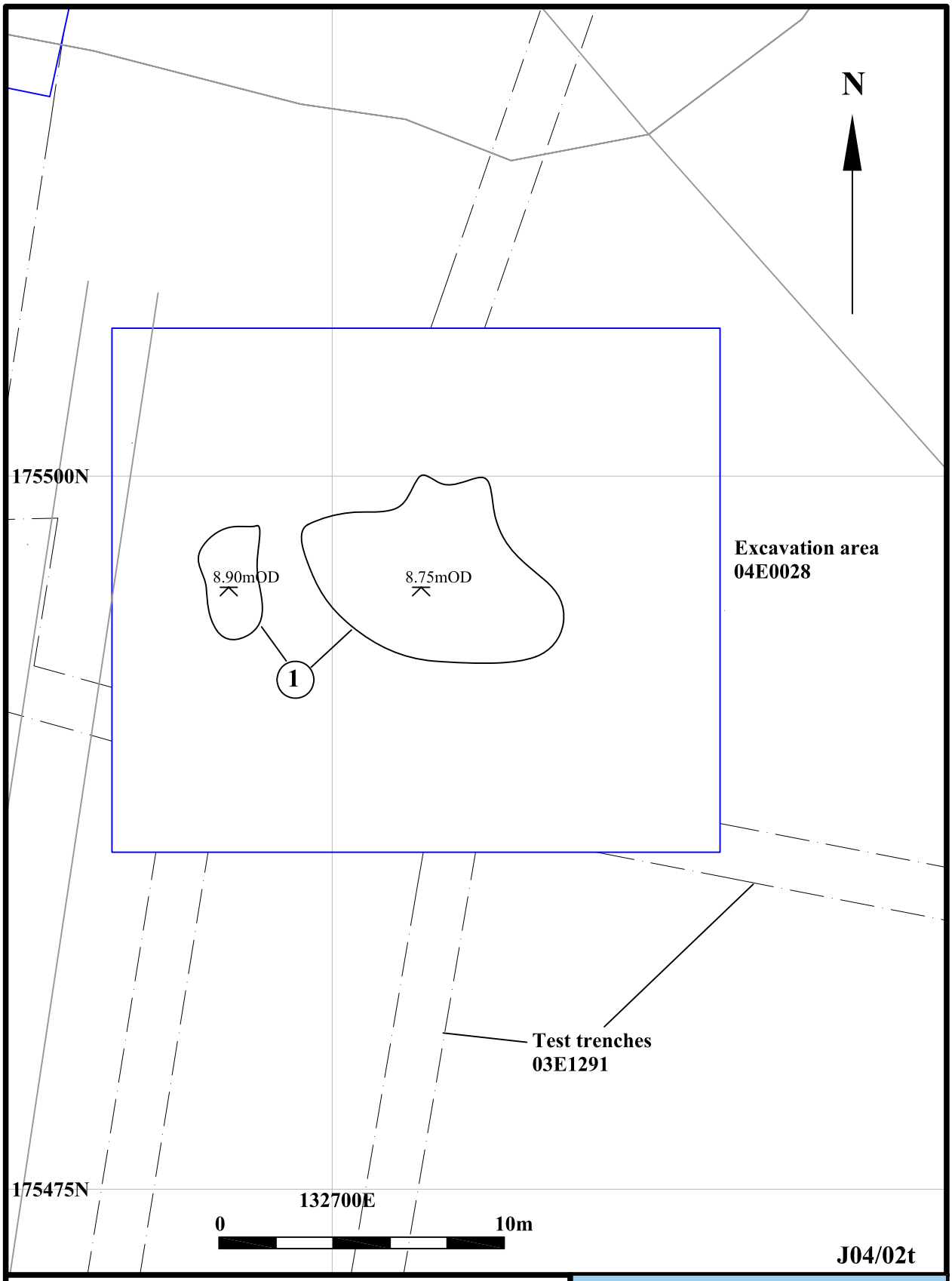
N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare,

04E0028

Figure 2: Site location in local landscape

Scale 1:5000

TVAS IRELAND LTD



N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare

04E0028

Figure 3: Plan of Area i

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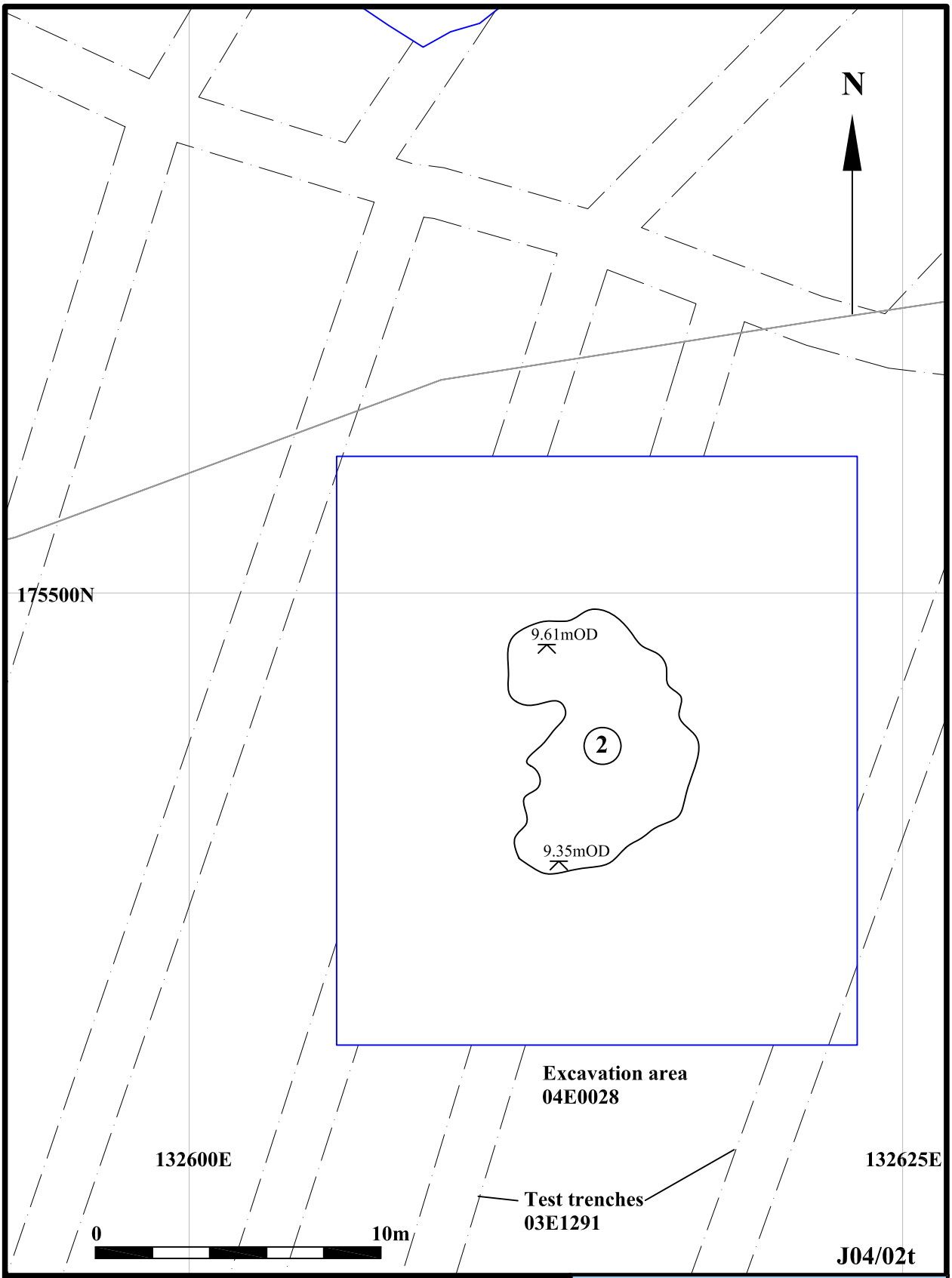

N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare

04E0028

Figure 4: Plan of Area ii

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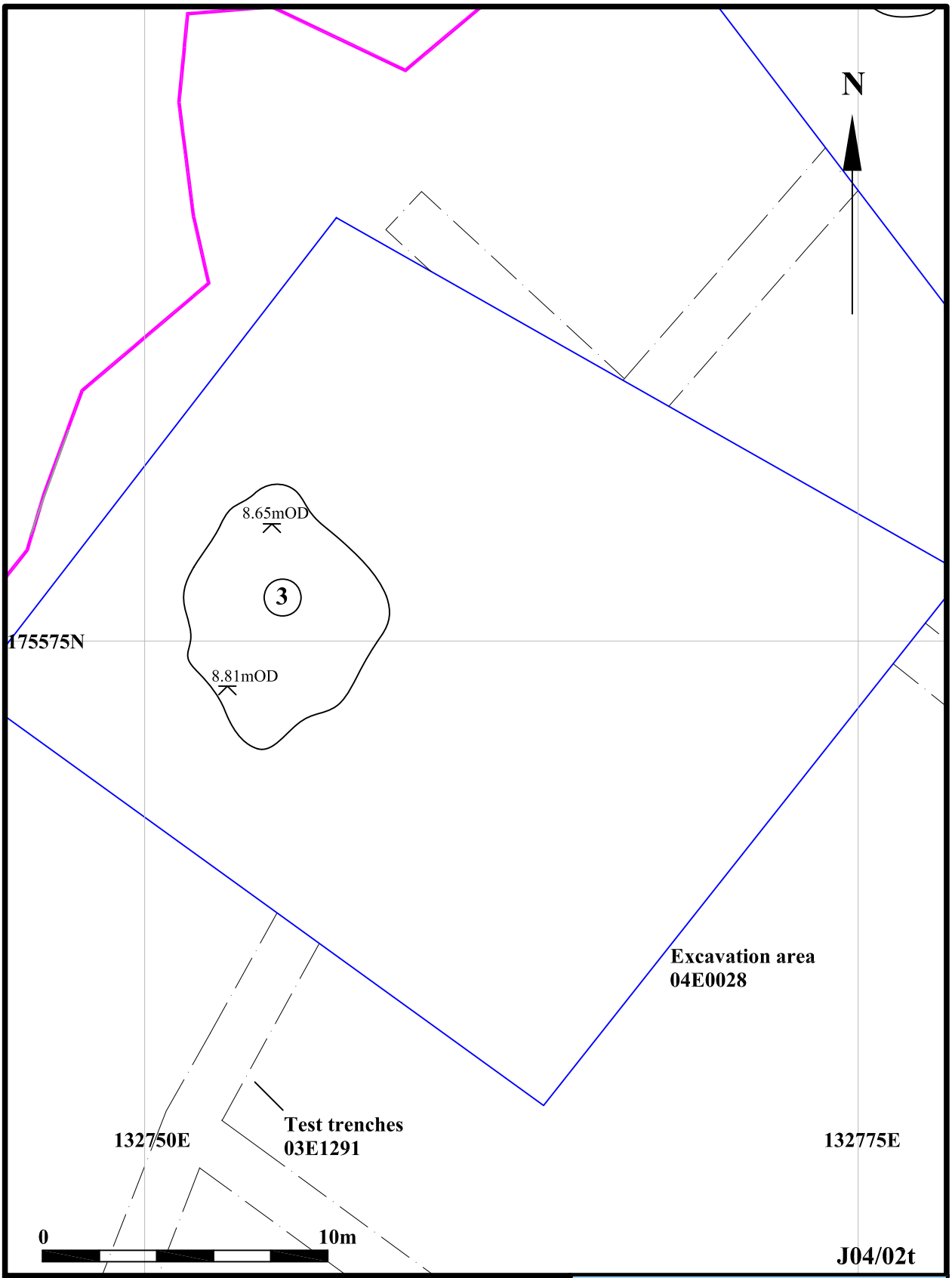

N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare

04E0028

Figure 5: Plan of Area iii

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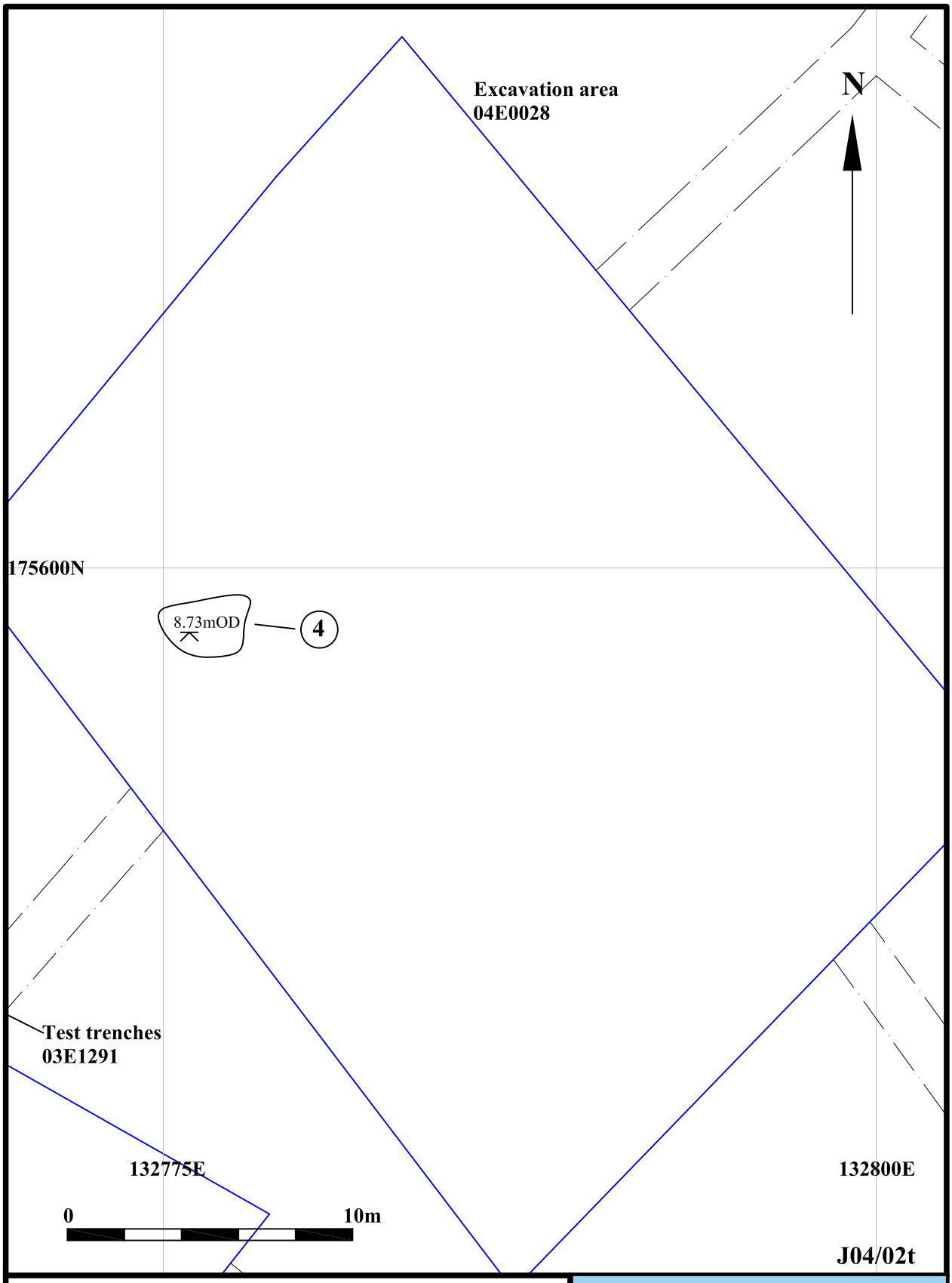

N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare

04E0028

Figure 6: Plan of Area iv

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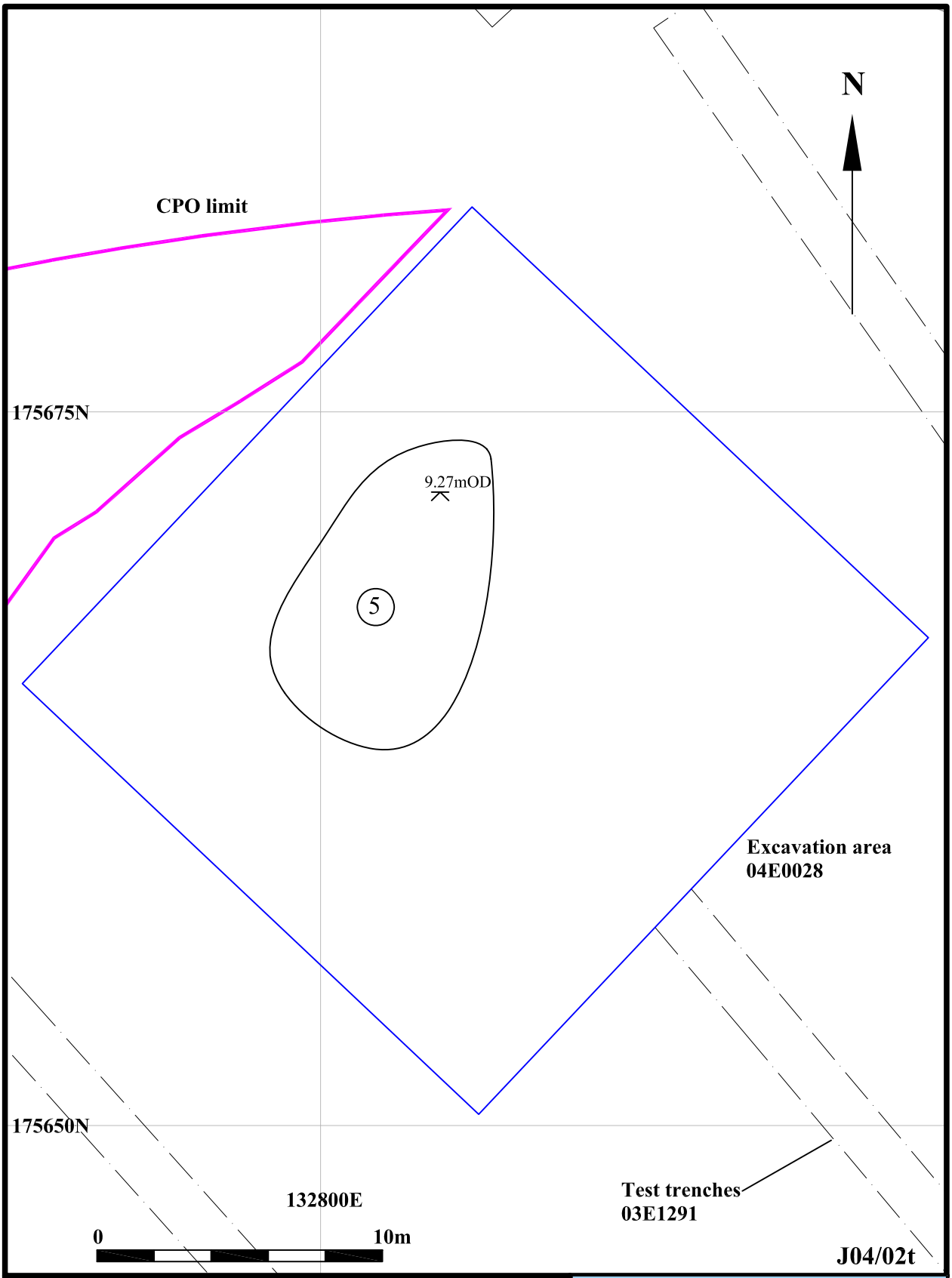

N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare

04E0028

Figure 7: Plan of Area v

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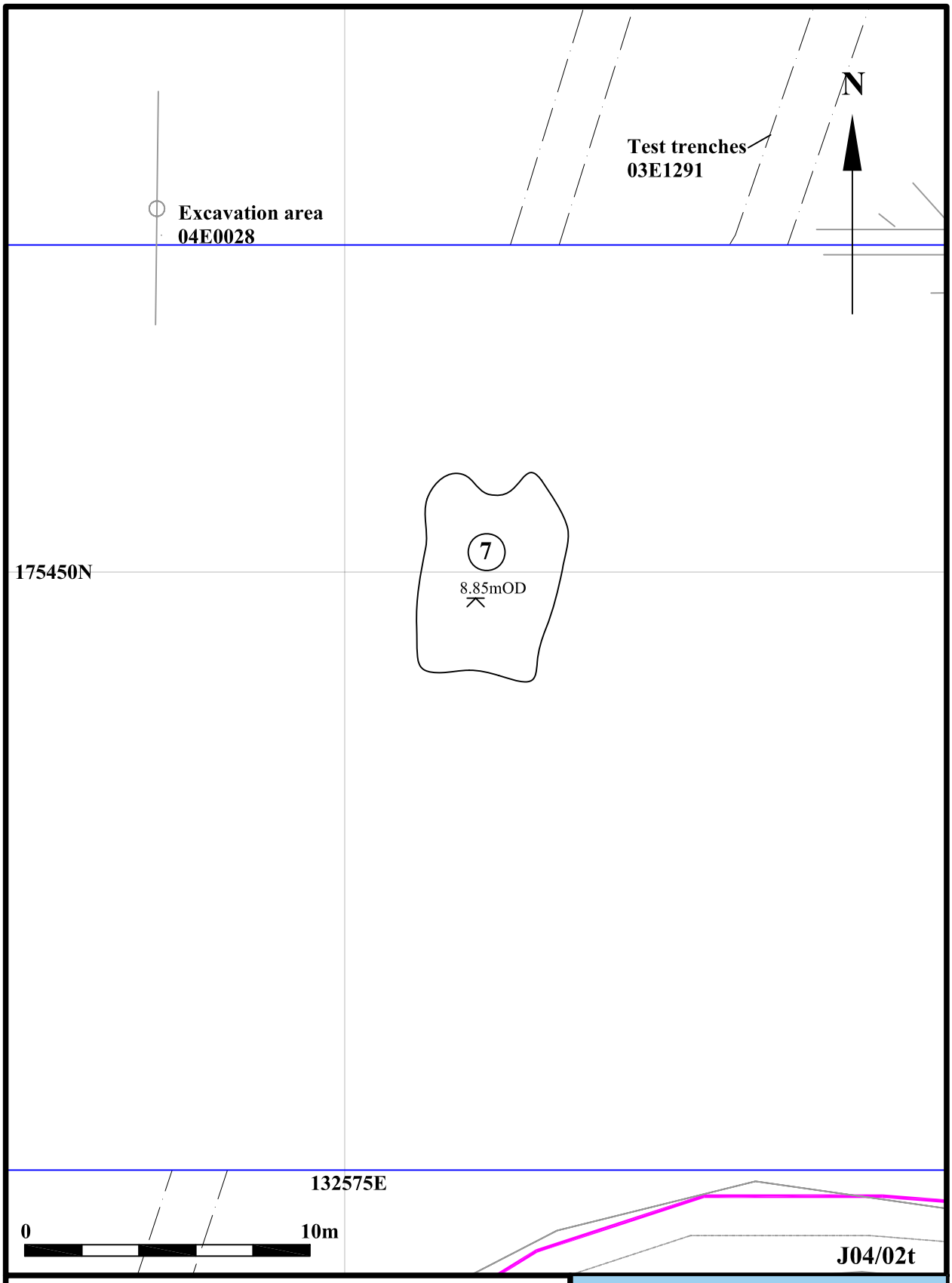

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04E0028

Figure 8: Plan of Area vii

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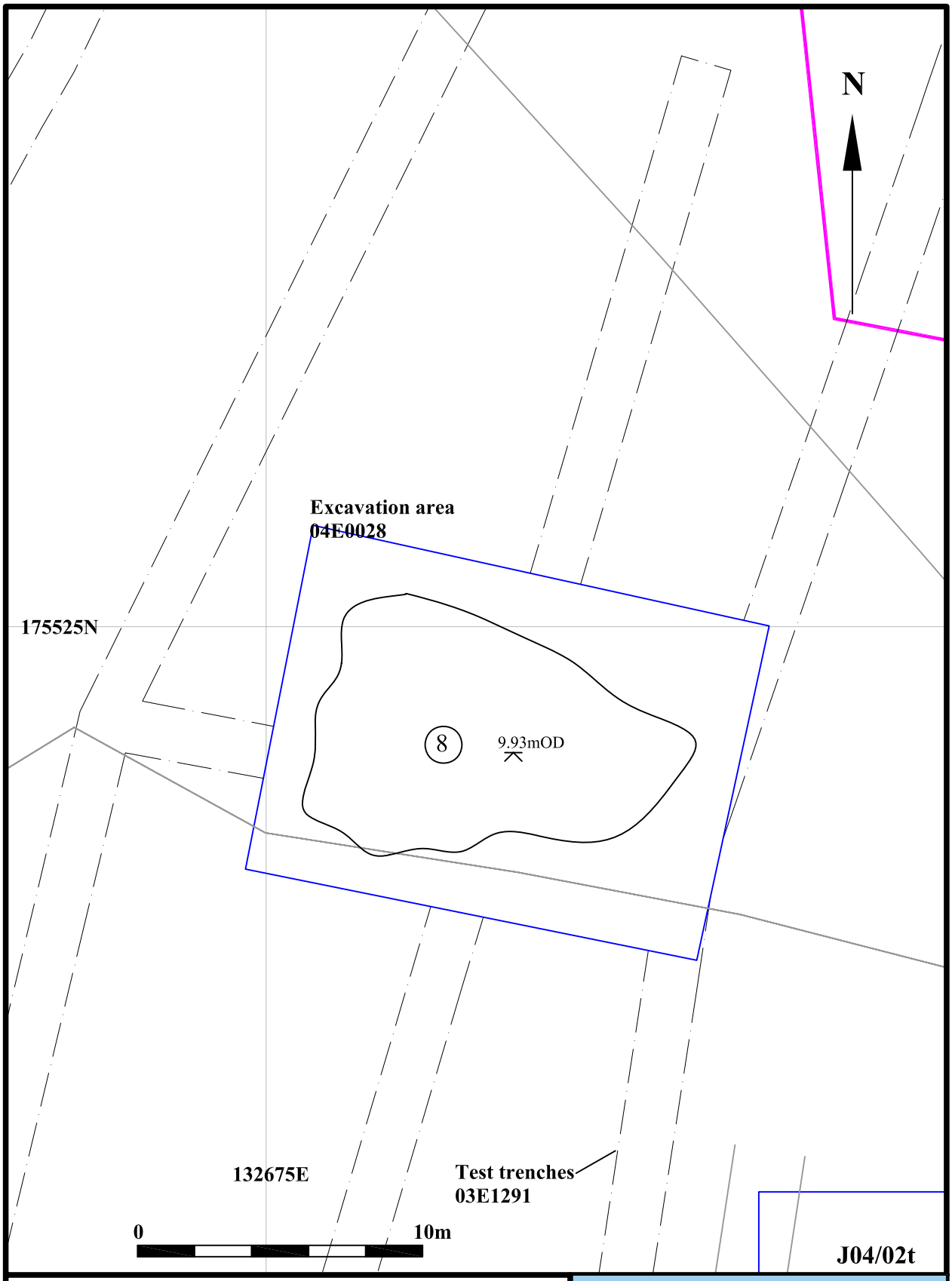

N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare

04E0028

Figure 9: Plan of Area viii

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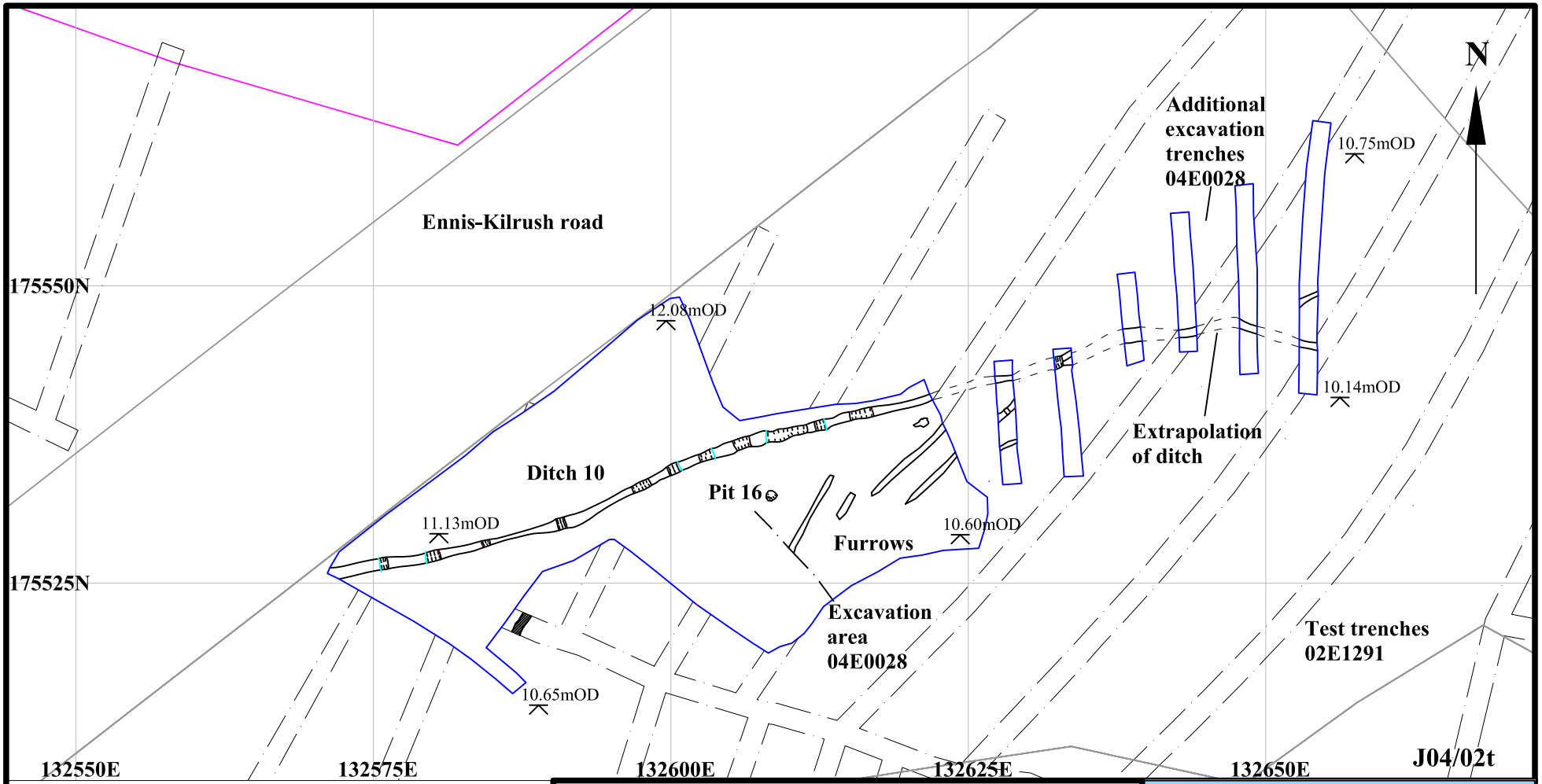

N18 Ennis Bypass, Site AR127, Cahircalla More, Co. Clare

04E0028

Figure 10: Plan of Area vi

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Plate 1. Aerial view of sites AR127 (i - viii). Looking west

Plate 2. Site AR127 (i). Looking east. scale 1m

04E0028

Plate 3. Site AR127 (ii). Looking east. Scale 1m

Plate 4. Site AR127 (iii). Looking east

Plate 5. Site AR127 (iv). Looking south. Scale 0.2m

Plate 6. Site AR127 (vii). Looking north-west

Plate 7. Site AR127 (viii). Looking west

Plate 8. Site AR127 (viii). Scale 0.2m

Plate 9. AR127 (i) at testing. Looking north-west. Scale 1m

Plate 10. AR127 (ii) at testing. Looking north. Scale 1m

Plate 11. AR127 (iv) at testing. Looking north-east. Scales 1m and 0.5m

Plate 12. AR127 (v) at testing. Scales 1m and 0.5m