Excavation of a Medieval Post-Mill Mound at Manor Farm, Humberstone, Leicester.

SK6285 0642

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For: The Environmental Dimension Partnership And Gateway College

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(SK 6285 0642).

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Summary

Archaeological recording of a medieval windmill mound at Manor Farm, Humberstone, Leicester (SK6285 0642), was undertaken between April and June 2007 by University of Leicester Archaeological Services (ULAS) in advance of development by Gateway College. Excavation revealed the mound to consist of two deposits of clay, both associated with a phase of the mound's development. A recut ditch encircled the mound and originally acted as quarry for the mound soils. Beneath the mound well-preserved timber cross-tree foundations survived in-situ within a construction slot cut into the natural clay. Pottery recovered from the construction slot and primary fills of each ditch cut indicated a 12th-13th century period of use for the mill. Later pottery in the final ditch fills suggest the mill ditches had become largely infilled by the 17th-18th century.

Introduction

Between April and June 2007 archaeological recording of a windmill mound earthwork was undertaken by University of Leicester Archaeological Services (ULAS) on land at Manor Farm, Humberstone, Leicester (Figure 1). The work formed part of a wider programme of archaeological recording in advance of the site's redevelopment by Gateway College. Initially the windmill mound and surrounding area was evaluated through a programme of trial trenching in December 2006 (Alsitzoglou 2006) during which the potential of the windmill remains was established. Following this, the earthworks of the windmill mound were surveyed and the mound stripped of topsoil in April 2007. Due to an unusually wet Spring, final recording of the windmill features was not able to be undertaken until June 2007. This report will concentrate on the results of the windmill recording; however a series of Iron Age enclosure ditches and associated features was recorded in areas to the south and east of the windmill and have been reported on elsewhere (Thomas 2008). The archive for the site will be deposited with Leicester City Museum Service under the Accession Number A6.1999.

Location and Topography

The development site is located north-east of Manor Farm, Humberstone, approximately 5km east of Leicester city centre. In total the site consists of an irregular, roughly linear block of land of *c*.5.15ha. which occupies an area off Colin Grundy Drive, Keyham Lane. The windmill mound lies on the eastern side of the development area. Prior to the excavation the site was used as pasture land and defined to the north-east by the A47 link road, to the south-west by Manor Farm and to the south-east by Humberstone police station (Keyham Lane) and Church Farm House. The area occupies a boulder clay ridge, at a height of 97-100m OD, overlying Lower Lias clays and limestone. To the south and north the ground falls off into the valleys of the Scraptoft and Melton Brooks respectively.

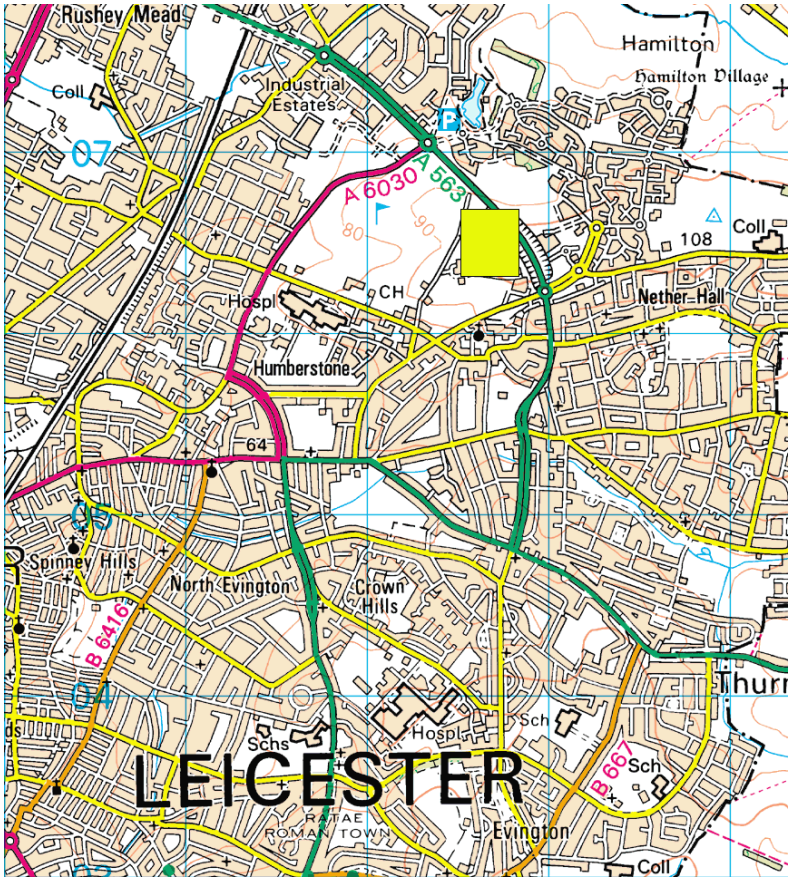

Figure 1 Location of the development area (highlighted).
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Archaeological and Historical Background

The Manor Farm windmill is situated in a rich archaeological landscape lying some 300m north-east of the village of Humberstone which has medieval origins (Thomas 1999, SMR Ref. LC434) and 1.5km south-west of the deserted medieval village of Hamilton (SMR Ref. LE456; SM 132). There were two manor houses associated with Humberstone; the Martival-Hesilrige Manor situated to the west of the church, and the Hotoft Manor, dating from at least the 12th century, east of this (Rahtz 1959, 2-3). There is insufficient evidence to allocate ownership of the windmill to either household in the medieval period although records indicate that the Hotoft Manor owned two windmills at Humberstone in the 16th century (Nicholls 1800, 273). An 1875 estate map of Humberstone Lordship records the excavation site as 'Manor Mill Close' although despite being a relatively prominent earthwork the mill mound is not depicted on the First Edition Ordnance Survey map of 1887.

The location of the Manor Farm windmill, within a field pattern of ridge and furrow earthworks, has since been surveyed from aerial photography by Hartley (1989, 75). This plan also shows the nearby earthwork remains of the two manors of Humberstone, and windmill remains to the east and west (Figure 2). The windmill mound to the east, at Elms Farm, is clearly shown on the 1887 Ordnance Survey map, and was recently excavated, revealing it to be the remains of a 13th century post-mill (Charles *et al* 1999, 229).

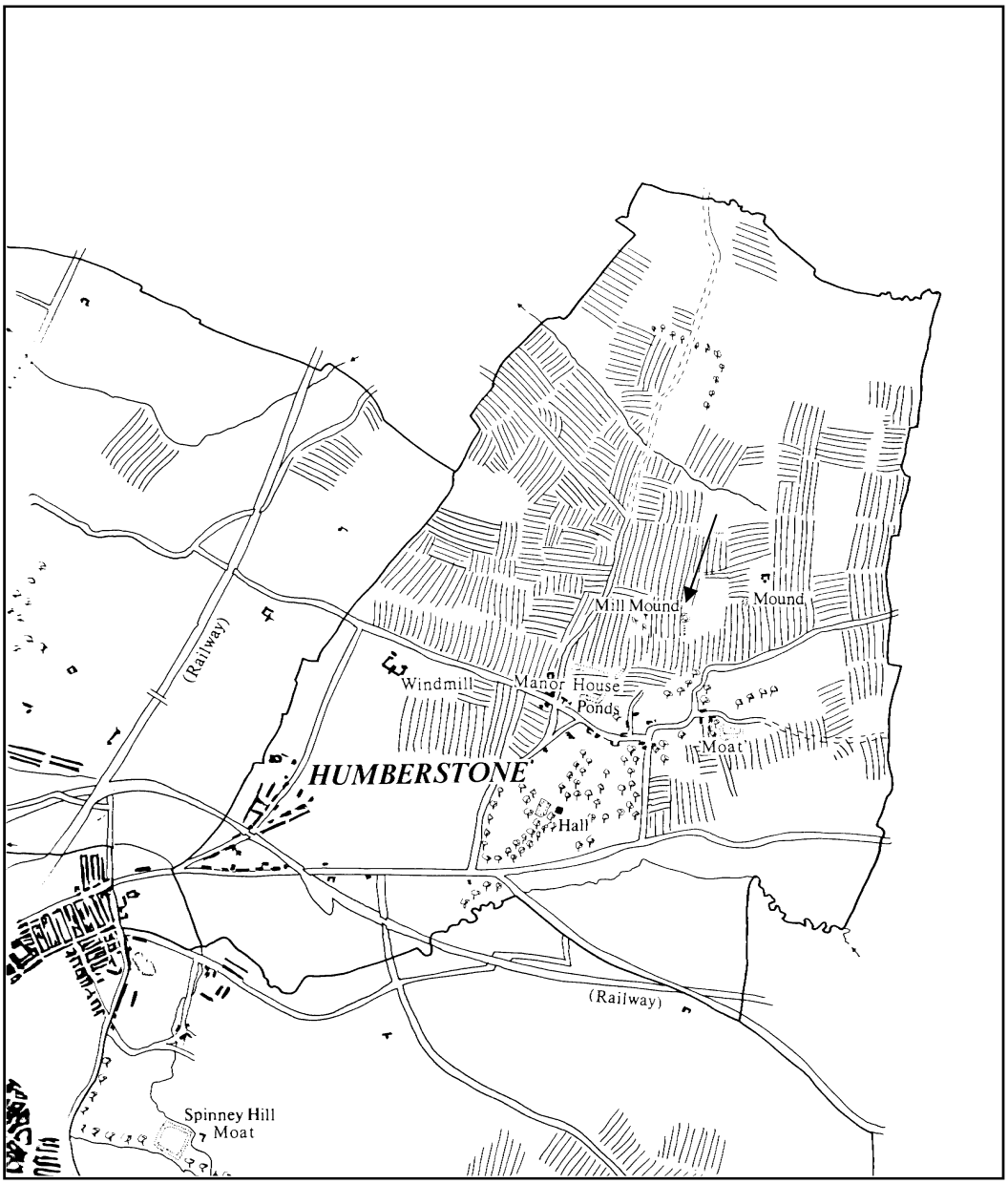

Figure 2 The Manor Farm mill mound (arrowed) within the surrounding ridge and furrow field pattern. The Elms Farm mill mound is situated to the east, The Martival-Hesilrige Manor (labelled 'Manor House') to the south-west and the Hotoft Manor (labelled 'Moat') to the south (After Hartley 1989, 75).

Aims and Objectives

The project aims were:

- To understand the formation and development of the windmill mound and any associated features.
- To determine a date for the establishment of the windmill mound and a chronology for any subsequent alterations.
- To record the findings of the excavation and create an archive of the results.

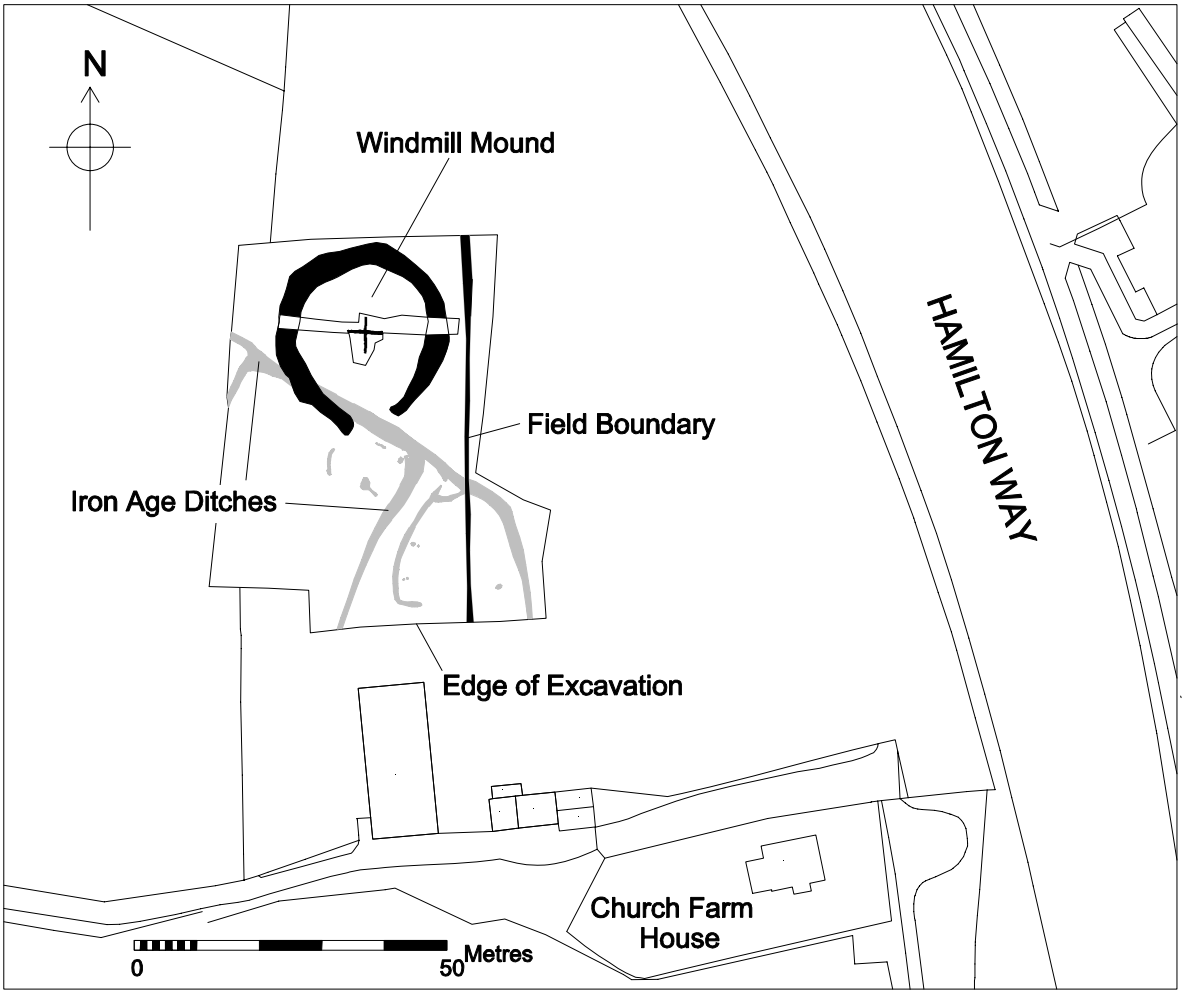

Figure 3 Location of the excavated are showing the windmill features and Iron Age ditches (in grey)

Methodology

The windmill mound was initially evaluated with a centrally placed trial trench dug by a JCB mechanical excavator. Following evaluation the entire mound was stripped of topsoil under archaeological supervision to fully expose the surrounding ditch (Figure 3). The site was then planned and located using GPS equipment. The original trial trench was re-excavated and expanded in order to reveal a cross section through the windmill mound and ditch for recording. All archaeological features were hand-planned, photographed and the sections drawn to scale (either 1:10 or 1:20 as appropriate). All written records were entered onto *pro-forma* ULAS context and timber record sheets and regularly updated site indices were maintained.

The preserved timbers of the mill foundations were cleaned to reveal their full plan and the grain of the wood. Mortices were excavated to expose any surviving information relating to tooling techniques and the shape/angle of housings. Box sections were excavated around the ends of each timber and the central joint to show the extent of survival. Samples of each timber were taken for tree-ring dating.

Excavation Results

The Medieval Windmill Mound: Structure and Form

The windmill area was defined by a broad ditch, enclosing an area of *c.*20.5m diameter within which an earthwork mound survived (Figure 4). The mound was made up of several clay layers and survived to a height of approximately 0.50m. Beneath the mound *in-situ* remains of the timber foundations (cross-trees) for the mill structure consisted of two squared oak beams within a construction slot. Medieval pottery from the ditch and cross-tree construction slot have enabled an approximate chronology to be suggested for the foundation and development of the mill.

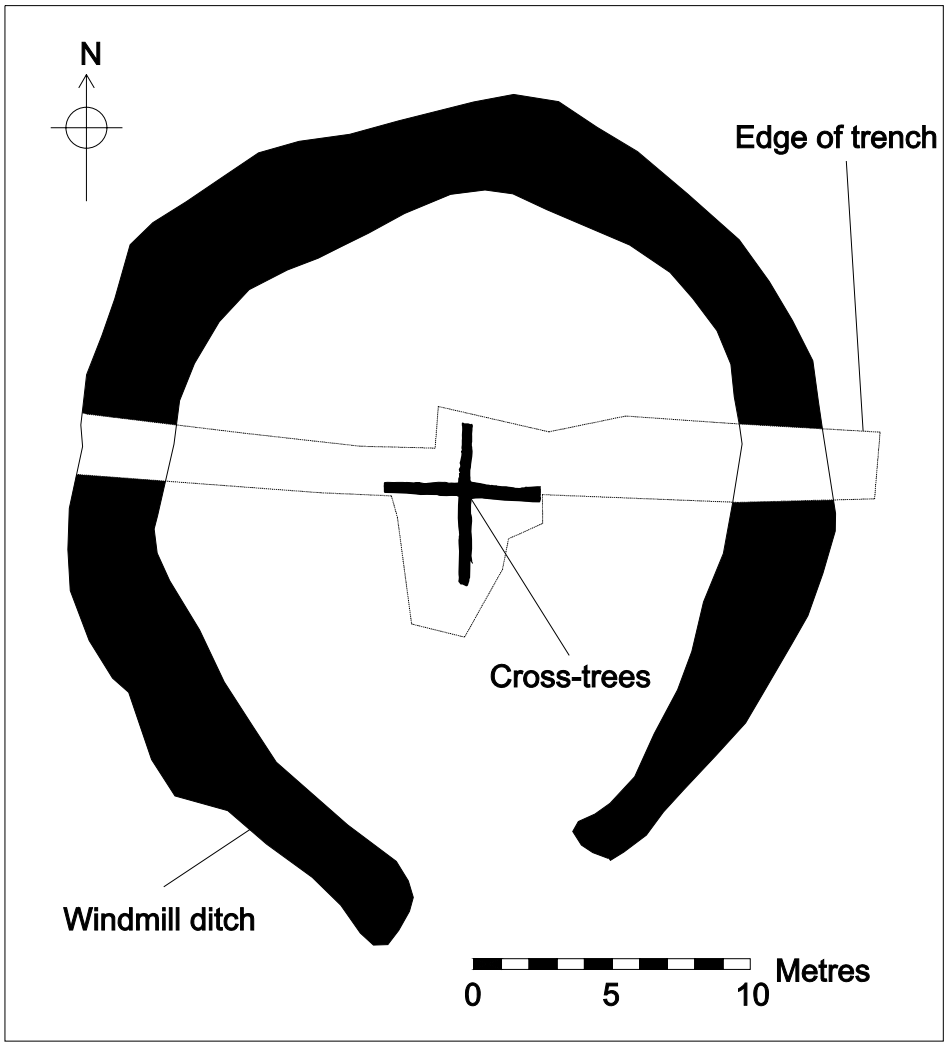

Figure 4 The windmill mound showing main features and excavation area

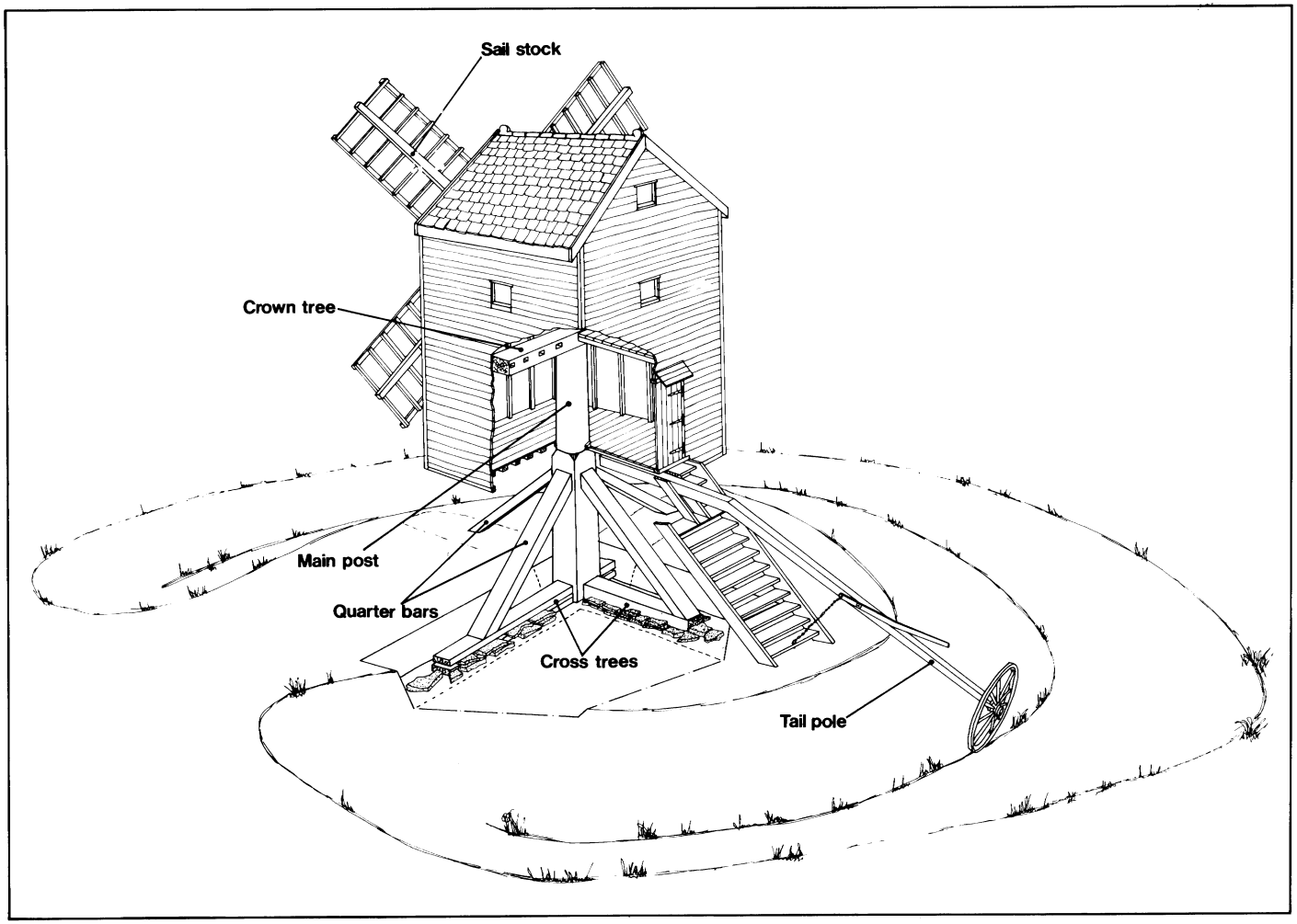

Figure 5 Artists reconstruction of a Medieval Post-Mill showing the principal components (after Mynard and Zeepvat 1991, 107 Figure 44)

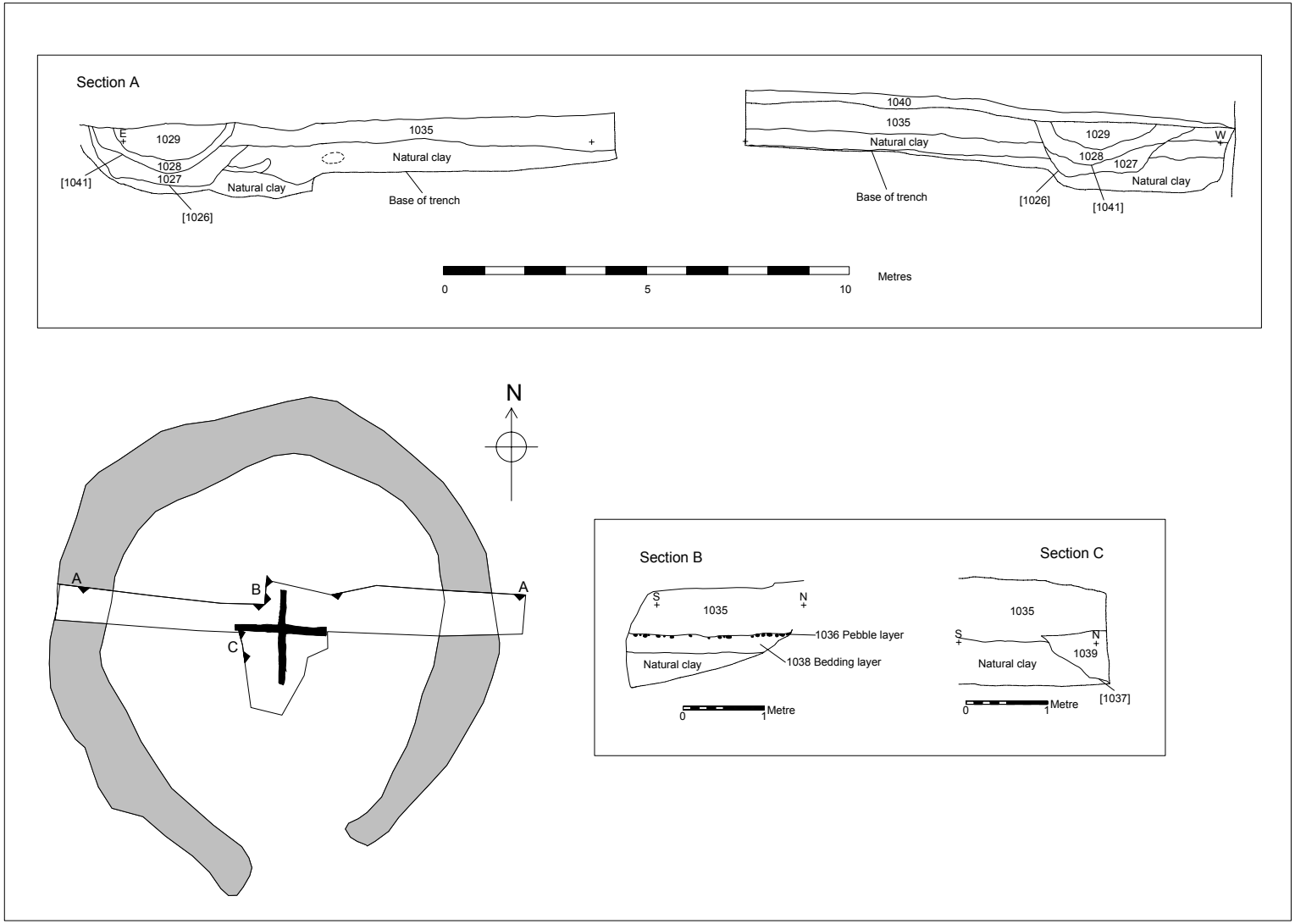

Figure 6 The windmill mound – main section drawings

The Enclosing Ditch

The ditch was C-shaped in plan with an internal diameter of *c.*20.5m and an external diameter of *c.*26.8m. A *c.*6.3m wide break in the circuit formed an entrance on the southern side. The northern half of the circuit formed a fairly regular curve, but the ditch straightened out slightly as it approached the entrance. Excavation revealed that the ditch comprised two phases; the first of which (Cut [1026]) was a broad and flat-bottomed cut *c.*4m wide, and *c.*1.6m deep. The single fill of this ditch consisted of firm, mid-greyish brown silty clay (Context 1027), from which several small sherds of 12th/13th century Potters Marston ware pottery were recovered. A second phase ditch (Cut [1041]) was shallower, *c.*1.2m deep, but had a similar broad, U-shaped profile *c.*3.5m in width. The main fill of this ditch consisted of dark greyish brown clay silt (Context 1028) which contained sherds of 13th century Chilvers Coton ware pottery. After the second phase had almost filled up, a final fill of light greyish brown silty clay (Context 1029) may represent slippage of the mound soils into the ditch remains following disuse.

The Mound

The windmill mound survived as a reasonably prominent earthwork, standing up to *c.*0.50m in height (see section drawings Figure 5). The mound consisted of two distinct clay layers, each apparently relating to a particular phase of the mill's use. The earliest mound, relating to ditch [1026], comprised a *c.*0.68m thick deposit of light yellowish brown sandy clay (Context 1035) which overlay a clay subsoil. On the western side, the mound had slipped, slightly covering the fill of ditch [1026], and indicating a period of disuse prior to the refurbishment of the mill in its second phase. The renewal of the mill mound was represented by a *c.*0.35m thick deposit of mixed sandy clay (Context 1040) which, once deposited, must have effectively re-emphasised the existing earthwork of the original construction. Evidence on the eastern side also indicated that after the mill had gone out of use for a second time the mound soil eventually slipped, covering the infilled ditch.

The Cross-Trees

Unusually the timber cross-trees that would have provided foundation for the post-mill had survived virtually intact at the base of the mound due to their proximity to the water-table level (Figures 6 and 7). The two main timbers (1021 and 1022) lay in a central position within the ditched area and were lapped together to form a cross-shape, with the ends orientated according to the cardinal points of a compass. Three surviving mortice slots were approximately equidistant from the centre of the cross-trees indicating a symmetrical arrangement of braces. Both timbers were of boxed heart oak, each converted from a single trunk.

The north-south timber (1022) measured *c.*5.4m long and *c.*0.40m square. The northern end of (1022) was roughly squared while the southern end of the timber was v-shaped, probably formed by the removal of wedges during the felling of the tree. Rectangular blind mortice slots were positioned at either end of (1022) to accommodate the quarter bars that braced the central vertical post. The northern mortice slot lay approximately 0.10m from the end of the timber and measured *c.*0.63m x *c.*0.15m with vertical sides and was *c.*0.17m deep. The southern mortice slot was *c.*0.13m deep and measured approximately 0.68m x 0.13m wide, lying approximately 0.40m in from the end. The northern end of this slot was not tooled, but sloped according to the natural direction of the wood's grain. Knots in the wood at this point suggest that this edge of

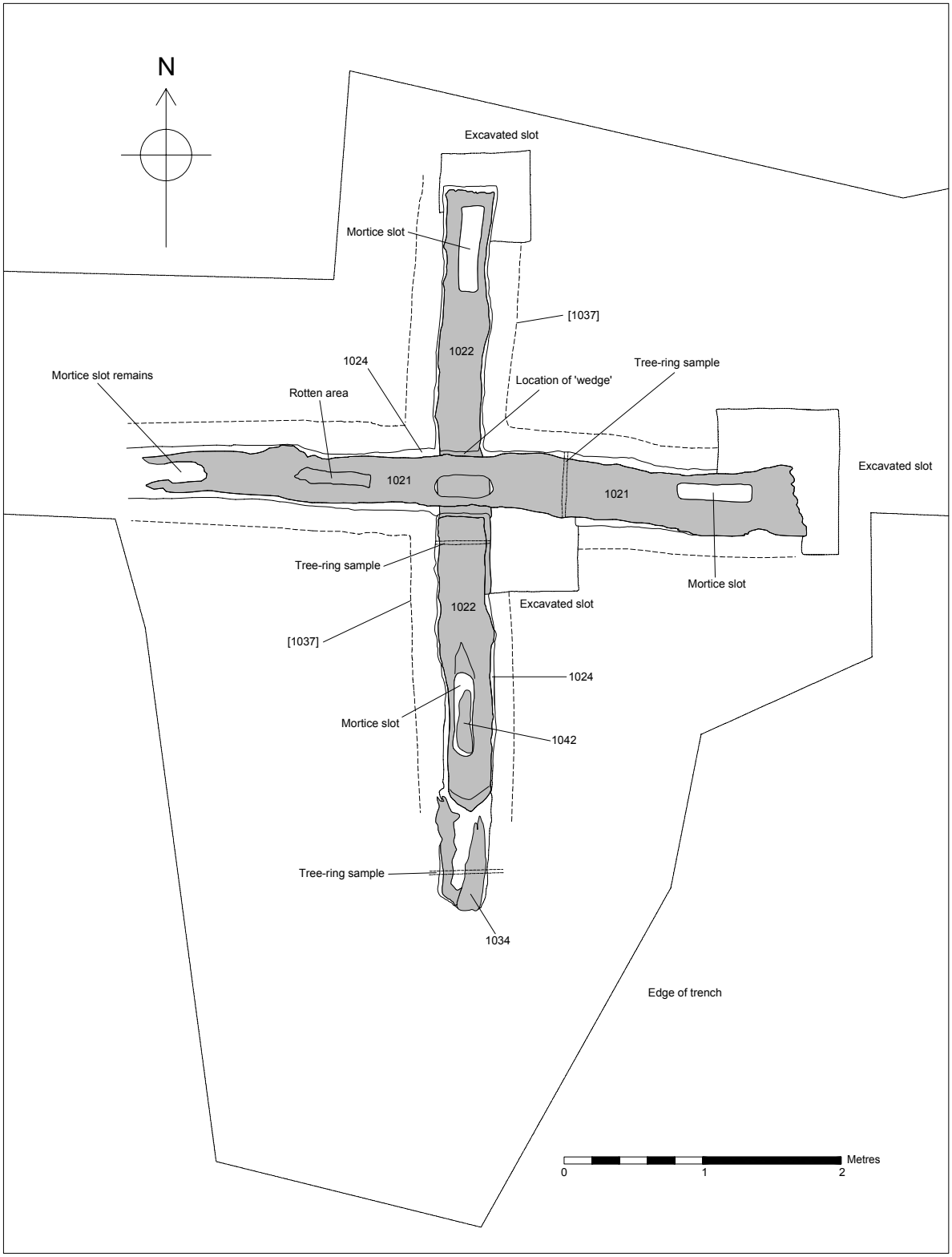

Figure 7 Detailed plan of the timber cross-trees

the slot had either made it too difficult to work, or that a vertical edge had been weakened and broken off. A loose piece of timber lying within the southern mortice slot (1042) may have been a remnant quarter bar fragment.

The central section of both timbers had been halved at the point where they crossed to form the lap joint. The uppermost timber (1021) was loosely situated within the joint and a thin piece of wood on the northern side of the joint may have acted as a wedge and helped maintain its position (see Figure 6), although the condition of this piece was too poor for a clear interpretation. A centrally placed mortice slot to hold the mill post cut through (1021), exposing part of the underlying timber (1022). This was rectangular with rounded ends and vertical edges, measuring *c.*0.43m x *c.*0.16m and *c.*0.14m deep. The clearest evidence for the joint was on the lower timber (1021), where a *c.*0.50m x *c.*0.13m deep slot had been cut. The surface of this slot was 'grainy' rather than facetted, indicating it had not been dressed with an adze, but was possibly split. Compression marks were evident on (1021) where the upper timber had borne down, but no imprint of the central mill post was evident, suggesting it had not fully penetrated the central mortice slot.

The east-west timber (1021) was *c.*4.3m long and approximately 0.40m square. The eastern end was intact and had been roughly squared, but the western end had rotted significantly resulting in the loss of information from this side of the cross-trees. The remaining blind mortice slot on the eastern end of (1021) was positioned *c.*0.30m in from the end of the timber and measured approximately 0.60m long by 0.11m wide. As with the southern mortice slot, the inner edge was angled, possibly to assist the housing of the quarter bar.

The Cross-tree Construction Slot

The cross-trees lay within a flat-bottomed construction slot with near vertical edges (Cut [1037] - measuring *c.*0.75m wide x *c.*0.30m deep at timber level). The fill of the construction slot (Context 1039) was relatively indistinct from the surrounding olive brown natural clay into which it had been cut, and was only recognisable by having a slightly looser and more 'mixed' appearance in comparison. A narrow band of silvery-blue clay (Context 1024) lay against the timbers within the construction slot. Rather than being a distinct 'fill' of the slot however, this most likely formed as a result of the outer timber edges rotting and mixing with the surrounding clay. Surviving evidence from elsewhere in the excavation trench (see Figure 7 Section C) indicated that the construction slot had originally been excavated through the subsoil from at least 1m above the level at which the timbers were positioned. A thin band of pebbles (Context 1036) was also evident on the opposite side of the trench (see Figure 7 Section B), occurring at a similar level to the top of the construction slot. Little can be said of this layer, although it is conceivable that it represents a temporary surface, laid down to provide firmer footing on the clay during the installation of the heavy timbers. A sherd of Potters Marston ware pottery from within Context 1039 suggests that the cross-trees were laid down in the 12th or 13th century.

Remains of an additional timber (1034), also with evidence for a mortice slot, lay close to the southern end of (1022) and probably represent an earlier cross-tree foundation associated with the first phase of the mills use.

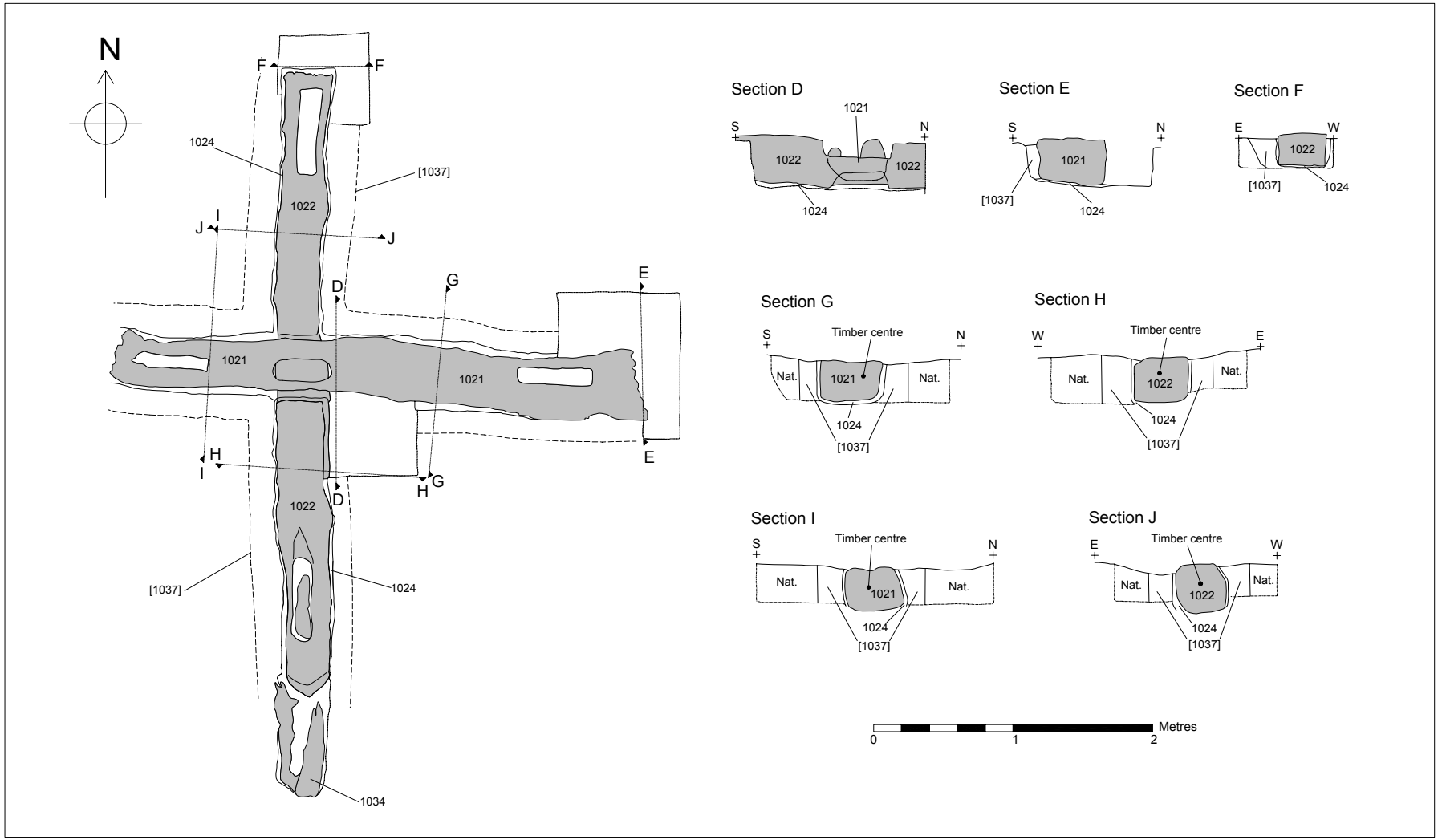

Figure 8 The timber cross-trees and associated section drawings

The Medieval Pottery – Deborah Sawday

Nine sherds of pottery weighing 119 grams, were recovered and catalogued with reference to the ULAS fabrics Series (Sawday 1989, Sawday 1991, Davies and Sawday 1999) and see Appendix below). One fragment of Potters Marston ware, dating from the 12th or 13th centuries was found in the backfill of the construction cut [1023] for the windmill, and four more sherds of a similar date range and in the same ware were recovered from the earliest layer (1027) in the backfill of the ditch [1026]. The now deserted medieval village of Potters Marston, approximately 18 km to the south west of Humberstone, had been a major pottery production centre during the early medieval period, supplying the bulk of the pottery found in Leicester and its hinterland at this time.

Three sherds of 13th a century Chilvers Coton vessel came from Context (1028) in the recut ditch [1041]. A sherd of the post medieval earthenware EA2, probably dating from the 17th or 18th century, was recovered from context (1029) associated with the disuse of the structure.

Discussion

The introduction of the windmill to England is understood to have happened towards the final quarter of the 12th century and helped supplement the capacity of watermills for providing grain for a rising population (Holt 1988, 20).

The Manor Farm windmill remains offer a good example of this type of medieval agrarian feature – commonly known as a post-mill. In construction, the box-like wooden mill structure would have been mounted on a post, which could be rotated, by means of a long tail pole, to enable the sails to face the wind. The central post was fixed to timber cross-tree foundations that were sunk into the ground and angled wooden struts (quarter-bars) provided further support to the structure. Further support for the central post and its foundations was provided by the mill mound, which was thrown up over the cross-trees and around the main post to provide stability. The characteristic enclosing ditch was the end result of quarrying to provide soil for the mound and may also have been used to accommodate the mill's tail pole.

Many other examples of windmill mounds can be found in the Leicestershire landscape as earthwork remains, often situated within a wider pattern of strip fields as the Humberstone examples are. Despite their ubiquitous nature however little detailed excavation work has been undertaken on mill mounds (Lewis 2006, 207), and so this project presented a relatively rare opportunity to examine such a feature in detail.

The Manor Farm windmill is the end result of two phases of use that can be dated to the 12th-13th century and it therefore represents a relatively early example. The stratigraphic evidence suggests there must have been an interim period between the two main phases when the windmill was not maintained, during which time the windmill ditch filled in and mound material slipped over to cover it. The primary dating evidence for the construction and development of the mill rests with pottery recovered from several key contexts including the primary ditch fills and cross-tree construction slot. It was hoped that a slightly more refined date would be provided by dendrochronology but unfortunately the growth patterns of the cross-tree timbers could not be matched to any known tree-ring sequence (Robert Howard pers. comm.). The pottery however, provides good comparable evidence to that recovered from the nearby Elms Farm windmill, suggesting that both were in use at a broadly similar

time. Pottery associated with the final infilling of the ditch suggests that the mill had gone out of use by the 17th-18th century.

In comparison to the Elms Farm mill, and to other excavated examples in the Midlands, the Manor Farm windmill is unusual in having a set of well-preserved, *in-situ* cross trees. Given that such timbers would have been a useful commodity in the middle ages, excavated examples of mills often reveal that robbing occurred after they had gone out of use, a practice recorded in contemporary documents (Jones 1979, 44). The results of this have been revealed locally at Tansor Crossroads, Northamptonshire (Chapman 1996-7) where the foundation slots of a post-mill had been distorted, and the mound disturbed, during the removal of the foundation timbers. Although measures were taken to avoid rotting of the timbers, such as stone and clay lining of the cross-tree slots, other excavated examples indicate that the foundation timbers degraded considerably over time. This can be suggested locally at Elms Farm (Charles *et al* 1999) where the cross-tree foundation slots survived relatively intact and can also be seen at Great Linford where much of the *in-situ* timbers had rotted away (Mynard and Zeepvat 1991). Where timber foundations do survive, building methods are variable, perhaps indicating that windmill construction techniques were not standardised and may at times have been experimental or subject to local tradition (Watts 2002, 107). The closest comparable method to the Manor Farm cross-tree construction appears to have been employed at Bridgwater Without, Somerset, where the timbers were also halved together in the middle (Webster and Cherry 1972, 211). Locally, preserved cross-trees discovered beneath a mill mound at Higham-on-the-Hill, Leicestershire were simply laid across each other (Bellairs 1900, 18) and at Bridlington, East Yorkshire, the cross-trees were found to be four separate beams arranged around the central post and held in place by packing stones and the overlying mound (Holt 1988, 140).

In conclusion the work undertaken on the Manor Farm windmill has provided important evidence for the life history of a medieval post-mill. The results are broadly comparable to that of the nearby example excavated at Elms Farm to the east, and may well have been in contemporary use. The information gathered has provided important information on the timber foundations of post-mills, features that rarely survive as a result of rotting or robbing. The development of the mill has also revealed that despite outward appearances, such seemingly simple features can often hide complex histories.

Acknowledgements

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Appendix – The Medieval and Later Pottery

Context	Fabric/Ware	Nos.	Grams	Comments
POT				
1024 [1023] Windmill construction cut	PM – Potters Marston	1	18	Body, + calcite/dolomitic limestone, abraded (Sawday 1991).
1027 [1026] Earliest ditch fill	PM	4	9	Includes 3 tiny fragments.
1028 [1041]	CC1 – Chilvers Coton ware 1	3	11	Jar rim, *c.*1250+
1029	EA2 – Post Medieval Earthenware 2	1	81	Base, roughly knife trimmed externally, fine red body, slipped & glazed internally, traces of slip externally, probably an early example of this ware, possibly a 17-18C wide mouthed bowl or pancheon (Sawday 1989).

Plates

Plate 1 The excavated trench through the windmill mound looking east with the cross-trees in the middle ground

Plate 2 Revealing the timber cross-trees

Plate 3 The northern mortice slot

Plate 4 The central lap-joint showing mortice for main post

Plate 5 The eastern mortice slot

Plate 6 The southern mortice slot and remains of earlier Cross-tree foundation

Plate 7 Cutting samples for dendrochronology

Plate 8 The central lap-joint on timber 1022 following removal of timber 1021