

# Witham Archaeology

A Report To Stamford Endowed Schools  
February 2006



## NEW HOCKEY PITCH AND TENNIS COURTS, STAMFORD JUNIOR SCHOOL, STAMFORD, LINCOLNSHIRE

### Archaeological Watching Brief

*R Trimble*

*acknowledged receipt*

Conservation Services
01 MAR 2007
Highways & Planning Directorate

*1/3/07  
jawell*

# NEW HOCKEY PITCH AND TENNIS COURTS, STAMFORD JUNIOR SCHOOL, STAMFORD, LINCOLNSHIRE

Site Code: SENS05  
 LCCM Accession No.: 2005.131  
 Planning Application No.: SO5/0232/69  
 NGR: TF 02900 06475

## *Archaeological Watching Brief*

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# NEW HOCKEY PITCH AND TENNIS COURTS, STAMFORD JUNIOR SCHOOL, STAMFORD, LINCOLNSHIRE

## ARCHAEOLOGICAL WATCHING BRIEF

### SUMMARY

An Archaeological Watching Brief was undertaken by Witham Archaeology at Stamford Junior School, Kettering Road, Stamford, during groundworks associated with the construction of a new synthetic hockey pitch and tennis courts.

Previous investigations on the site had revealed buildings and burials associated with the Benedictine nunnery of St Mary and St Michael. These remains included a drain interpreted as the nunnery's reredorter.

The current project produced scant evidence of the Benedictine nunnery. However, an undated iron-smelting site was found on the school playing fields, approximately 130m east of the school buildings. Parallels between slag from the site and material found elsewhere in Stamford indicates a probable late Saxon or Saxo-Norman date (predating the nunnery). Previous investigations in the immediate vicinity of the school buildings have produced occasional fragments of smithing slag, found in association with 10<sup>th</sup>-12<sup>th</sup> century pottery.

### 1.0 INTRODUCTION

This report describes the results of an Archaeological Watching Brief undertaken by Witham Archaeology during groundworks associated with the construction of a synthetic hockey pitch and hard tennis courts at Stamford Junior School, Stamford, Lincolnshire. The work, commissioned by Stamford Endowed Schools in response to a condition of planning permission issued by South Kesteven District Council, was carried out during the period 22 June to 4 July 2005.

The construction works entailed the breaking up and removal of existing hard tennis courts situated on ground to the south of Kettering Road, and their replacement by a synthetic hockey pitch measuring c. 101.50 x 63m in area. In general (with the exception of a grassed area to the southeast) the works were contained within previously disturbed ground.

The new tennis courts, built on grassed playing fields situated to the north of Kettering Road and east of the school buildings, extend over an area of c. 90 x 35m. The groundworks required general ground reductions of c. 200mm (mostly topsoil), increasing to c. 350mm on slightly higher ground to the south.

The information in this document is presented with the proviso that further data may yet emerge. Witham Archaeology cannot, therefore, be held responsible for any loss, delay or damage, material or otherwise, arising out of this report. The document has been prepared in accordance with the Code of Conduct of the Institute of Field Archaeologists.

### 2.0 SITE LOCATION, TOPOGRAPHY & GEOLOGY (See Figs. 1 & 2)

Stamford Junior School lies southwest of the historic core of Stamford on the south side of the River Welland (NGR TF 02900 06475), its grounds extending each side of Kettering Road, between farmland to the south and a southwest - northeast railway line to the north. The new hockey pitch is

situated on comparatively low-lying ground to the south of Kettering Road, while the new tennis courts are located on higher ground c. 100m northeast of the main school buildings, close to the boundary with the football club to the northeast.

The geology of the area varies in accordance with the topography, with Lower Lincolnshire Limestone (Inferior Oolite Series) present across higher ground to the north and Upper Lias clay on lower ground to the south (Geological Survey of Great Britain, England and Wales, Solid & Drift, Sheet 157).

### **3.0 ARCHAEOLOGICAL & HISTORICAL BACKGROUND**

Recent archaeological interventions at Stamford School have resulted in the recovery of a small number of Neolithic flint flakes (HER No. 35259) and a Late Neolithic to Early Bronze Age thumbnail scraper (HER No. 35260).

A potsherd of 5<sup>th</sup> to 7<sup>th</sup> century date was found during a recent watching brief at the school (Snee 2001).

The Benedictine nunnery of St Mary and St Michael was founded on the site by William de Waterville in c. 1155 as a cell of Peterborough Abbey. Originally housing both nuns and monks, the nunnery was dissolved in 1536, with Richard Cecil acquiring the site in 1540. Peck reported in 1727, that all buildings associated with the nunnery had, by that date, been completely demolished. In 1734, a new house (Nuns' House) was built on the site (Hartley & Rogers 1974).

Archaeological remains thought to relate to the nunnery – including wall foundations, window mullions, five stone coffins, human bone, and coloured glass - were discovered during construction of the Stamford-Leicester railway in 1846 (RCHME 1977).

In 1973, construction work on a new school building, revealed walls and medieval occupation material on the site of the nunnery. The remains, recorded during subsequent archaeological investigations, included a subterranean arcade comprising round-headed arches, interpreted as the south wall of the reredorter (Scheduled Ancient Monument No. 22607). A clay-lined reservoir built at ground level may have been used to flush the reredorter. The investigations also produced evidence of a large quarry south of the reredorter (RCHME 1977).

Excavations carried out in 1999 (Cope-Faulkner 1999) in advance of a classroom extension revealed painted plaster walls, a mortar floor, and evidence of a slate roof with green glazed ridge tiles. The remains appear to relate to one of the nunnery buildings, possibly forming part of a cloister. Hammerscale indicative of iron-working on the site was recovered from environmental samples taken from probable post-medieval demolition deposits. A subsequent watching brief (Hambly 2000a), carried out during construction of the extension and the installation of a gas pipe along the access road to the east, resulted in the discovery of an undated structure comprising two alignments of limestone running parallel with one another. Covered in rubble, the feature was interpreted as a wall, or as a drain, possibly associated with the reredorter recorded during earlier investigations (see above). Three pieces of smithing slag were recovered during the watching brief.

An evaluation carried out in 2000 (Hambly 2000b) in advance of work to extend the school car park located five cut features (rectangular in shape) interpreted as grave-cuts associated with the nunnery. Investigation of two of these features revealed human remains (left in situ), with 10<sup>th</sup> – 12<sup>th</sup> century pottery and a piece of smithing slag being recovered from one of the grave-fills. A pit produced iron-stone fragments along with 10<sup>th</sup> – 12<sup>th</sup> century pottery. Later monitoring during construction of the car park and the installation of an electricity cable (Snee 2001) resulted in the discovery of an undated feature interpreted as a hearth (domestic or industrial), postholes of a possible timber structure, and a pair of ditches running parallel with one another. A rubble deposit was interpreted as the fill of a possible robber trench.

More finds, together with a quantity of limestone fragments thought to relate to the destruction of the nunnery, were found during another watching brief (Hambly 2000c), occasioned by an extension to the school's porch.

Remains attributable to the nunnery, including five grave-cuts (three with visible skeletal remains), the corner of a building, a limestone drain, and a cobbled surface, were found to the north of the railway line passing to the north of the main school complex, during the construction of an extension to the school's boarding house (Hambly 2001). The structural remains were thought to post-date the cemetery.

During a recent watching brief (Snee 2001) a quarry pit dated 18<sup>th</sup> century was recorded. It was speculated that the feature may have been related to ironstone extraction. Rubble spreads, thought to represent a rectangular structure of post-medieval date, were also located.

#### **4.0 AIMS & OBJECTIVES**

The purpose of the project, as stated in a Witham Archaeology specification of 19 May 2005 was to:

- Allow the preservation by record of any surviving archaeological deposits and artefacts exposed by the development groundwork within constraints imposed by the contractor's working methods, programme and development design.
- Provide an opportunity in the event of the discovery of significant archaeological remains, beyond the scope of that catered for in the specification, to signal to all interested parties that a find has been made, for which there were insufficient resources to support treatment to an adequate level.

Specific Objectives were to:

- Produce a project archive for deposition with the appropriate museum together with a client report.
- Provide information for accession to the County Sites and Monuments Record.

#### **5.0 METHODOLOGY**

The watching brief was maintained through site visits timed to coincide with episodes of topsoil stripping and/or ground lowering. All stripped surfaces were inspected for archaeological deposits/features and/or finds. Records were made of the stratigraphy exposed by these works, through representative sections and general notes. Deposits containing iron-slag, exposed at the southern limit of the tennis court area, and occurring at the site formation level, were mapped at scale 1:50 and subjected to limited, exploratory investigation, to obtain a sample of stratified material as well as a sample to process for potential iron-working remains such as hammerscale.

The above record was supplemented by a series of colour print photographs detailing the main phases of groundwork and depicting specific archaeological deposits/features.

#### **6.0 RESULTS (See Figs. 3 & 4)**

##### **6.1 Area A – New Tennis Courts**

A superficial geology of limestone brash was exposed across the majority of Area A, giving way to an overlying deposit of moderately compact to compact, light yellowish brown clayey sand (120) at the southeastern end of the stripped area.

A concentration of iron slag was revealed during topsoil stripping at the southern corner of Area A. Identifiable features included at least one cut feature (112). Aligned southeast – northwest, with an irregular plan shape, it was part excavated to reveal a steeply sloping northern edge breaking quite sharply to a sloping base (rising slightly to the south). It was filled by a mix (111) of loose, mid brown sand (50%) and slag to 100mm in size with very small grits (50%). Processing of a 10 litre sample <1> taken from the deposit resulted in the recovery of a considerable quantity of slag (mostly tap slag - the by-product from tapping out of the arch at the base of a bloomery shaft furnace), as well as furnace structure, ore, and fired clay. The slag was in fresh condition consistent with inclusion in a primary context directly associated with the smelting process (See Cowgill, Appendix B). A yellowish brown sandy silt abutting the edge of the cut suggests the possibility of a lining (possibly timber).

Another slag-rich deposit (113) was located to the northeast of feature 112, extending up to and beyond the southeastern limits of the stripped area. The deposit, which comprised a mix of reddish brown/light brown sand (70%), and slag to 50mm in size (30%), appeared to lie within a shallow hollow or cut (114). Two smaller areas of light brown sand mixed with slag - (115, cut 116) and (117, cut 118) – situated between 112 and 114 may be interpreted as potential cut features.

The wider area east of 112 and north of 114 was occupied by moderately compact mid greyish brown clayey sand (119) containing frequent fragments of stone and slag. The deposit could represent the remnants of a layer, but the possibility of it being contained within a large cut (or cuts) cannot be discounted.

A substantial quantity of unstratified slag (mostly tap slag), along with other material deriving from the iron-smelting process, was collected from across the area and retained under context 124.

The sequence of deposits visible in the northwest facing trench side demonstrated a c. 80mm cut into the underlying clayey sand (120). This was overlain by a deposit, c. 0.12m thick, of moderately compact, mid yellowish brown clayey sand (123) containing angular limestone fragments to 20mm in size. The latter was sealed by topsoil, c. 0.15m thick (101).

A comparatively recent cut (108), dated by pottery to the late 18<sup>th</sup>/19<sup>th</sup> century or later, was located at an approximate mid point along the southwestern edge of Area A. Linear in form, and orientated southeast – northwest, it was visible over a distance of at least 8m, seeming to terminate to the northwest and extending beneath residual topsoil to the southeast. The feature, which was approximately 0.50m wide and 0.10m deep, with sides sloping at 45° to a flattish base, may be interpreted as a ditch or gully. Limited excavation revealed a fill of loose to moderately compact mid grey-brown silty sand (107) with inclusions of frequent angular stone to 50mm and charcoal flecks. Finds cattle bones, late pottery, and a rod of iron. Some displaced cattle bones (109) almost certainly derived from the same feature.

An undated feature (105) cut into limestone brash was found at the northwestern end of the site. With an irregular plan shape, it measured c. 2.0m (max) along its long axis (SE-NW) x 0.90m wide, and was filled by a moderately compact, mid grey-brown, silty sand (104) containing frequent limestone fragments to 50mm across in size. There were no associated finds but other irregular patches of topsoil-like material in the immediate vicinity suggest possible quarrying in the area.

Unstratified finds (100 and 125) from area A included several metal objects (all dated to the 20<sup>th</sup> century) recovered through metal detecting of spoil, and a small assemblage of pottery, the earliest sherd being dated to the 13<sup>th</sup> – 15<sup>th</sup> century. Topsoil at the southeastern end of the area (102 and 103) produced 19<sup>th</sup> pot, a fragment of clay pipe and two fragments of animal bone.

## 6.2 Area B – New Hockey Pitch

The topography of the lower playing fields, with ground sloping gradually downwards to the west, necessitated that the greatest depths of ground reduction occurred at the eastern end of Area B, with negligible impact upon deposits over the western part of the area.

A moderately compact mid brown, sandy silt (122) extended throughout the area previously under grass. At least 0.35m thick (extending below the lower limit of excavation) in a section recorded at the southeastern corner of the area, the deposit may be interpreted as a soil deriving from medieval and/or post-medieval arable farming, possibly within ridge and furrow field systems. Alternatively, the deposit may represent a layer of colluvium (hill-wash material) resulting from ploughing on the adjacent slopes. One fragment of pottery embedded in 122 (collected as 110) was dated to the 17<sup>th</sup> to 18<sup>th</sup> century. A 0.15m depth of soft, mid brown sandy silt topsoil (121) extended over 122.

The stripped surface in those areas previously covered by the tennis courts was partially obscured by remnants of the base material. However, a probable ditch, orientated approximately north-south, was noted in the northeastern part of Area B, during localised stripping to establish ground reductions. The feature had a silty fill (slightly organic?) and appeared to be cut into generally silty deposits. The area as a whole is prone to waterlogging.

Finds (106) including pottery and a clay pipe were collected from the stripped surface following topsoil removal over the grassed area. These were generally 18<sup>th</sup>/19<sup>th</sup> century in date.

## 7.0 DISCUSSION AND CONCLUSION

The watching brief revealed evidence relating to a probable iron smelting site at the southeastern end of the area stripped for the new tennis courts (Area A). Although the site did not produce associated and datable artefactual material similarities between the slag assemblage and material from other sites in Stamford would appear to indicate a late Saxon or Saxo-Norman date. Previous archaeological investigations have demonstrated the existence of a late 9<sup>th</sup> to 11<sup>th</sup> century iron-working industry north of the River Welland, on the eastern periphery of the area defined by the Danish enclosure. The current site represents the first indication of a contemporary industry south of the river. Ores and clays are locally available, while proximity to the river would have provided access to necessary fuel supplies (see Cowgill, Appendix B).

Finds from recent watching briefs on the Junior School site provide additional support for iron-working activities predating the nunnery. Smithing slag was found with 10<sup>th</sup> – 12<sup>th</sup> century pottery (both probably residual) in the fill of a grave thought to be associated with the nunnery, while an adjacent pit produced iron-stone fragments and 10<sup>th</sup> – 12<sup>th</sup> century pottery. A separate investigation produced a small quantity of smithing slag.

The watching brief produced scant evidence for features and deposits associated with the nunnery. It might be suggested, therefore, that both of the areas investigated were remote from the main complex of buildings. Wet conditions across the low-lying ground south of Kettering Road may have rendered that area particularly unsuitable for habitation, and a thick sand/silt deposit found beneath the existing topsoil in the grassed part of Area B may be interpreted as a relict ploughsoil, or colluvium (hill-wash material) deriving from ploughing of the adjacent slopes.

The ditch or gully (108) found in Area A would appear to form part of the post-medieval/modern system of land division or drainage, probably associated with post-dissolution farming on the nunnery site. This ditch might, originally, have been much deeper, with the results of the watching brief indicating truncation to the level of the limestone brash over the majority of Area B, but the survival of a sandy 'subsoil' where ground slopes to Kettering Road to the southeast. This truncation – probably arising from levelling of the playing field - is also evident in the sharp rise to adjacent land at the northeast boundary of the school grounds.

In conclusion, the current project has revealed important evidence of iron-smelting in the grounds of Stamford Junior School. This activity, which appears to predate the foundation of the nunnery in the late twelfth century, may be linked to previous discoveries further to the west, of smithing slag and 10<sup>th</sup> – 12<sup>th</sup> century pottery. The remains might originally have been more extensive, with truncation over the majority of Area A to the northwest removing any further evidence.

## **8.0 ACKNOWLEDGEMENTS**

The author of this report would like to thank Mr JA McLoughlin, Bursar of Stamford Endowed Schools for his assistance and interest in the project, also the representatives of the respective contractors: Mr R Shepherd of Anglia and Midland Sport Surfaces, and Mr A McAllister of Charles Lawrence Sports and Play Solutions for their co-operation in facilitating archaeological fieldwork. Thanks are also due to the various specialist involved in the project: Jane Cowgill (iron-working remains), Jane Young (pottery and tile), and Gary Taylor/Paul Cope-Faulkner (Other finds & faunal remains), and to the staff of the Lincolnshire Historic Environment Records Office for assistance in locating information relevant to the site.

## **9.0 BIBLIOGRAPHY**

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## **10.0 PROJECT/ ARCHIVE DETAILS**

### **10.1 LHA NOTE DETAILS**

SITE CODE: SENS05

PLANNING APPLICATION No.: S05/0232/69

FIELD OFFICER: R Trimble

NGR: TF 02900 06475

CIVIL PARISH: Stamford

SMR No.:

DATE OF INTERVENTION: 22 June to 4 July 2005

TYPE OF INTERVENTION: Watching Brief

UNDERTAKEN FOR: Stamford Endowed Schools

### **10.2 ARCHIVE DETAILS**

PRESENT LOCATION: Witham Archaeology, 65 Grantham Road, Sleaford, Lincolnshire, NG34 7NG

FINAL LOCATION: The City and County Museum, Friars Lane, Lincoln

MUSEUM ACCESSION No.: 2005.131

ACCESSION DATE: -

***The Site Archive Comprises:***

Context Records	25
Plans at Scale 1:50	1
Section Drawings at Scale 1:20	3
Colour Slide Photographs	7
Colour Print Photographs	49
Set of Site Notes	1

*It is intended that transfer of the archive in accordance with current published requirements will be undertaken following completion of this project.*

## **COLOUR PLATES**



*Plate 1 - View showing topsoil stripping in progress, Area A, looking southeast*



*Plate 2 – General view of the slag site, Area A, looking southwest*

## COLOUR PLATES



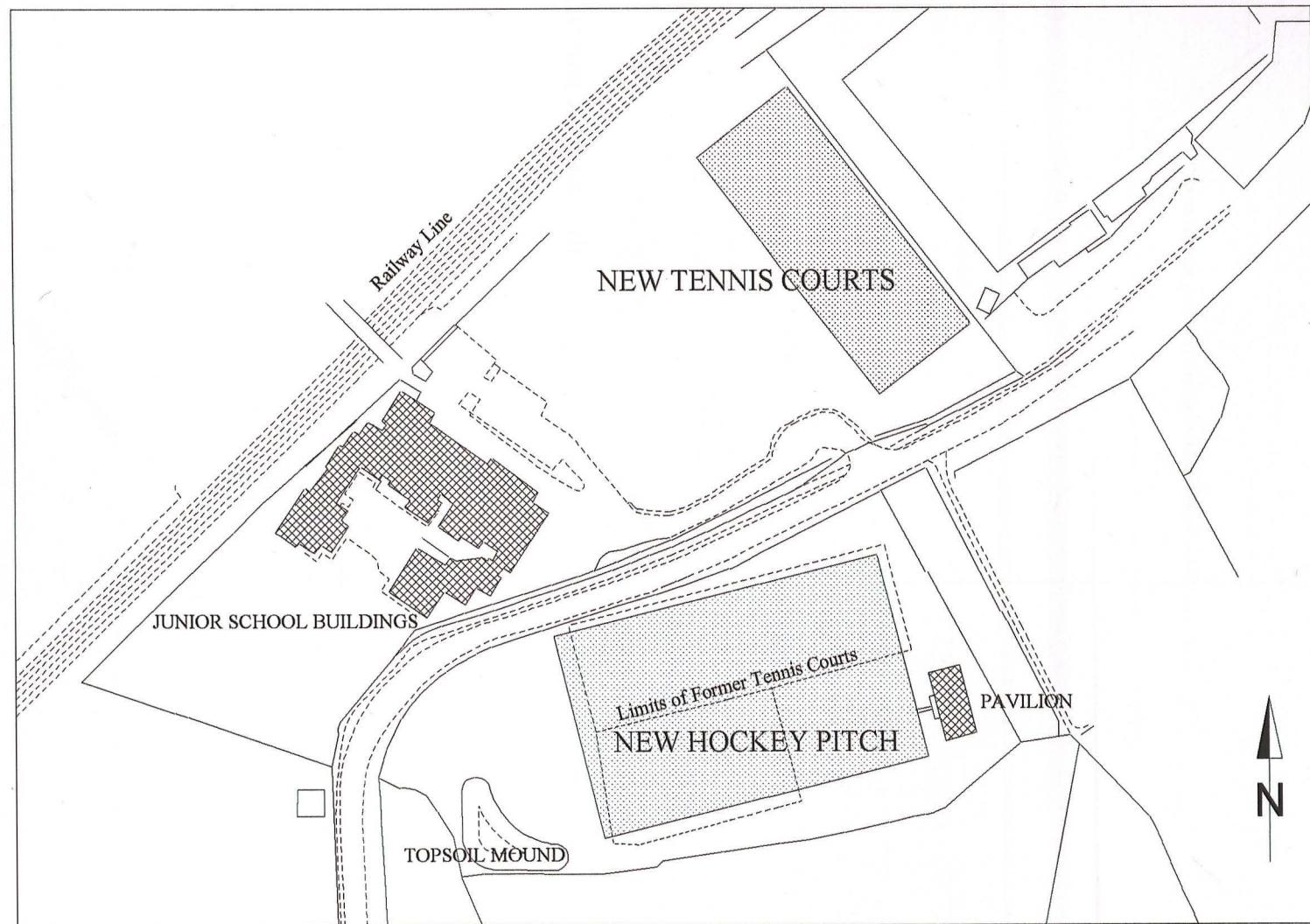
Plate 3 – Slag from feature 112 (10cm scale).



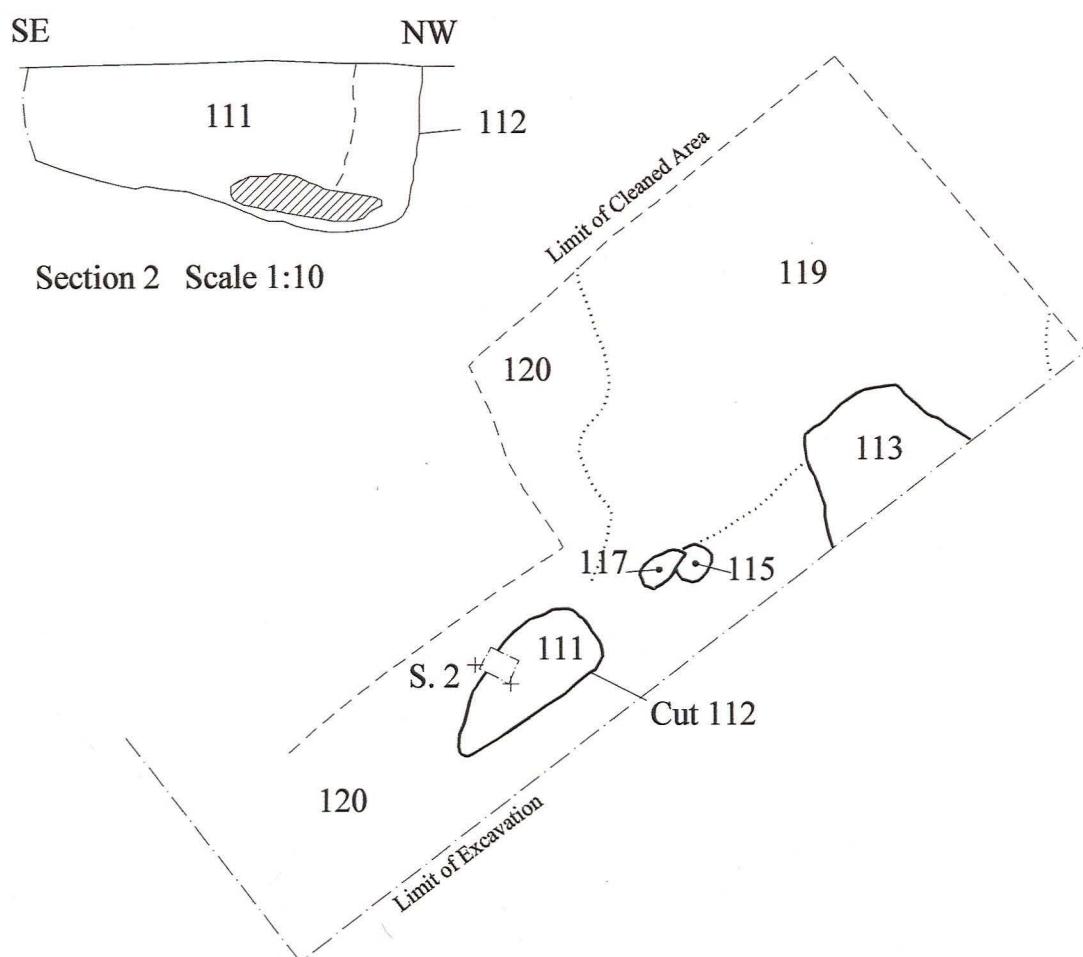
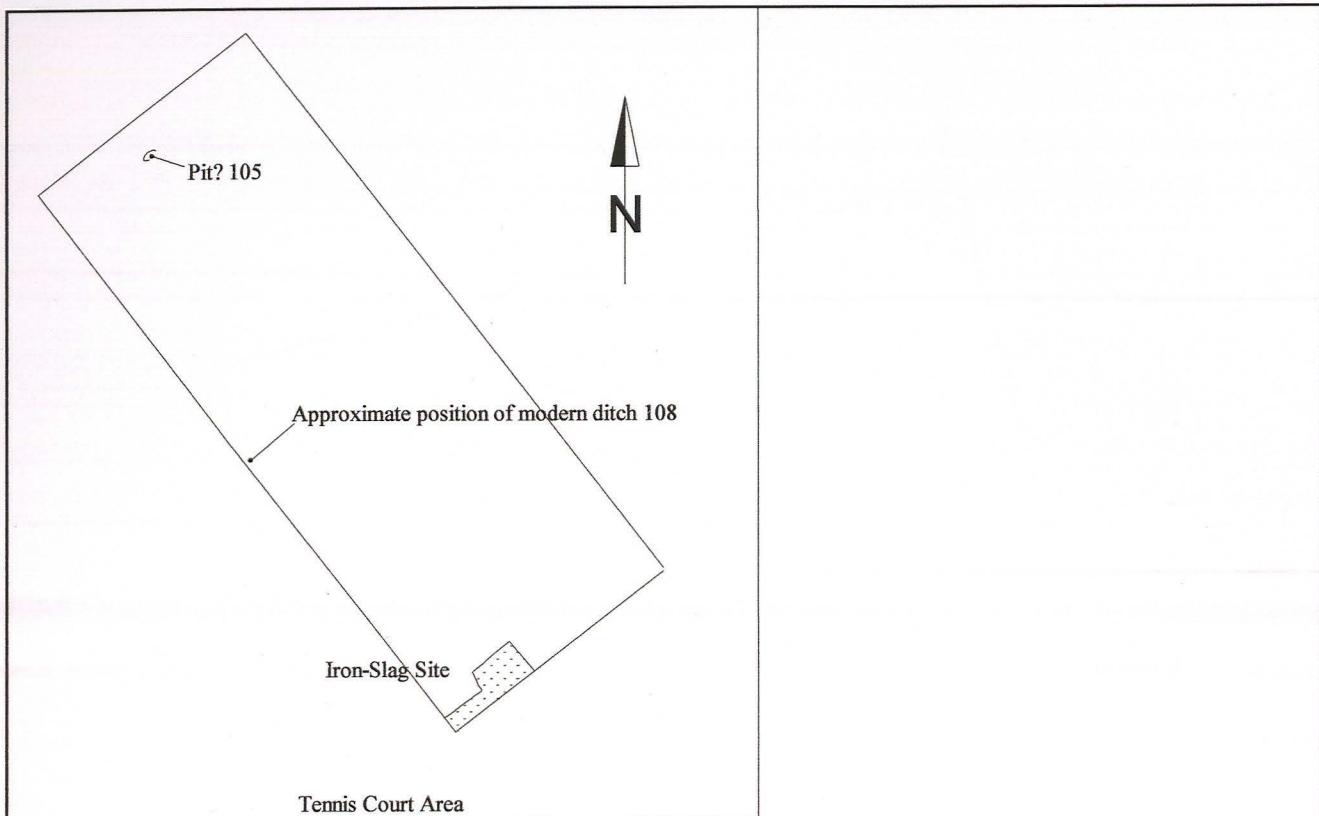
Plate 4 – Area of increased ground reduction, Area B, looking northeast along the line of a possible ditch

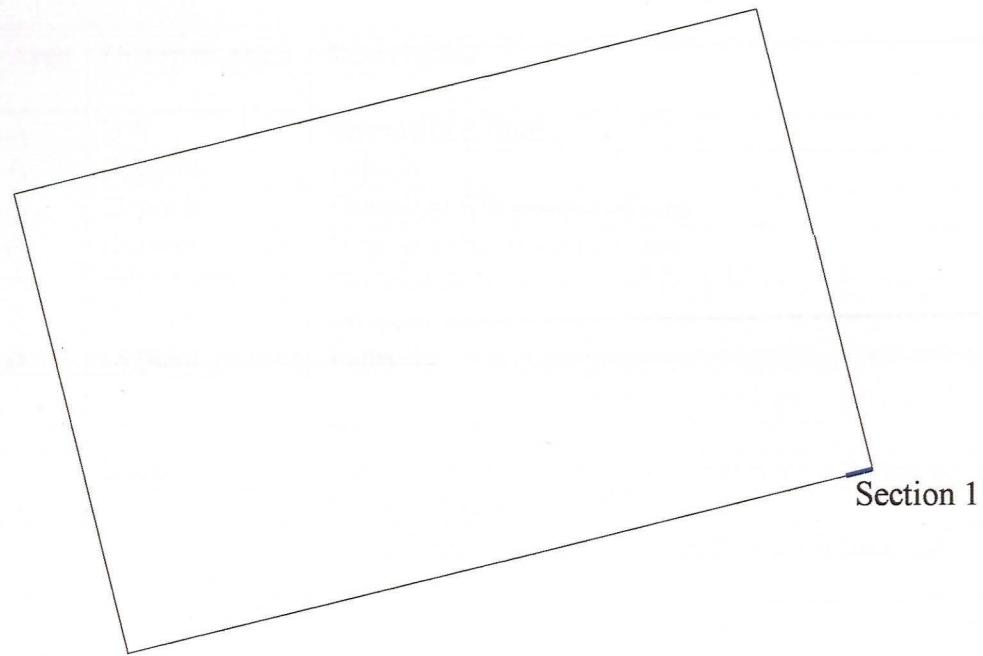


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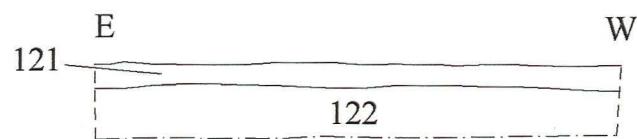


Based upon drawing supplied by Stamford Endowed Schools





Section 1



Section 1

## APPENDIX A - CONTEXT LIST

No.	Area	Interpretation	Description
100	A	U/S	Unstratified finds
101	A	Deposit	Topsoil
102	A	Deposit	Topsoil at SW corner of area
103	A	Deposit	Topsoil at SE corner of area
104	A	Fill of 105	Moderately compact, mid grey-brown silty sand
105	A	Pit cut?	Irregular in plan shape, measuring 2 x 0.9m
106	B	Deposit	Topsoil
107	A	Fill of 108	Loose to moderately compact mid grey-brown silty sand
108	A	Ditch?	Linear; orientated SE-NW; 0.5m wide x 0.10m deep
109	A	Finds	Displaced bone from 107?
110	B	Finds	Finds from immediately beneath topsoil (grassed area)
111	A	Fill of 112	Loose mid brown sand/very small grit (50%) and slag to 100mm in size (50%)
112	A	Cut	Sub-oval plan shape; 2.4m x 1.1m in plan; steep NW side
113	A	Fill of 114	Mixed reddish brown/light brown sand (70%) and slag to 50mm (30%)
114	A	Cut/hollow?	Irregular plan shape, only partially revealed; 2.3m+ x 1.5m+ in plan
115	A	Fill of 116	Light brown silty sand (50%) and slag to 40mm (50%)
116	A	Cut?	Approximately circular; 0.5m diameter
117	A	Fill of 118	Light brown silty sand (50%) and slag to 100mm (50%)
118	A	Cut?	Sub-oval in plan; 0.7m x 0.3m in plan
119	A	Deposit – layer?	Moderately compact mid greyish brown clayey sand containing freq limestone fragments and slag
120	A	Natural?	Moderately compact to compact light yellowish brown clayey sand containing very occasional limestone
121	B	Deposits – topsoil	Soft mid brown sandy silt
122	B	Layer (colluvial?)	Moderately compact light yellowish brown sand/silt
123	A	Layer	Moderately compact mid yellowish brown clayey sand containing angular limestone fragments to 20mm
124	A	Finds	Unstratified slag from southern corner of Area A
125	A	Finds	As 100

## APPENDIX B

### SMELTING SLAG AND ASSOCIATED FINDS

#### Introduction.

Evidence for iron smelting, near medieval Stamford was recovered by Witham Archaeology, during work which was being undertaken to construct new tennis courts and a hockey pitch for Stamford Junior School. The evidence was recovered from a number of apparent 'cut' features or hollows that were revealed during topsoil stripping. A concentration was noted and sampled in feature 112 (fill 111), which was an irregular oval in shape and measured c. 2.60m x 1.00m in plan with a depth of 0.22m. Context 124 represents unstratified finds from the vicinity of this pit. The site was probably truncated when the ground was leveled to be turned into playing fields.

#### Recording Methodology.

The industrial sample was processed in the following manner. The sample was weighed and the volume measured prior to being washed in a 'Siraf' tank (Williams 1973) using a flotation sieve with a 0.3mm mesh and an internal wet-sieve of 0.5mm mesh for the residue (to contain any hammerscale). Both the flot and residue were dried and the residue subsequently re-floated to ensure the efficient recovery of charred material. The dry volume of the flot was measured, and the volume and weight of the residue recorded.

The dried residue was sieved through 7 and 2mm meshes and these larger fractions were sorted by eye. Archaeological and environmental finds were picked out and bagged separately after being recorded on a sample assessment sheet. A magnet was run through the two finer residues (<2mm and 2-7mm) for the extraction of magnetic material, in particular roasted ore and any hammerscale or prill. The flot was examined by eye and the presence of environmental finds was briefly noted by DJ Rackham and G Martin who have also recorded any other environmental finds (Table 2). The flot was then bagged and it, with the entire residue, has been kept.

The hand collected slag and any associated debris was received washed and dried. The slags and associated debris from the excavation and sample were identified solely on morphological grounds, by visual examination, sometimes with the aid of a x10 binocular microscope. It was then recorded on *pro forma* recording sheets and the information was entered directly into Table 2 below. A note of fuel type was recorded when fragments were incorporated within the slags or imprints present.

The hand-collected finds are listed in Table 1 while those from the samples are given in Table 2. There was no animal bone or any other finds recovered from the sample.

#### The sample.

The sample was taken as a whole earth sample, which means that no finds had been extracted from it. A few uncharred *Chenopodium* sp. seeds and modern rootlets are present amongst the flot indicating low levels of modern contamination and the *Cecilioides acicula* (blind-burrowing snail) shells are probably intrusive.

#### Description of the Assemblage.

A total of 153 pieces (c. 10kg) of slag and associated finds was hand collected from the site with an additional 2,462 pieces (12.4kg) being recovered from the sample. Most of the slag is black and glossy, non-magnetic and in a fresh condition. The majority of this material is tap slag, a type that is a by-product of smelting iron ore in a bloomery shaft furnace to produce metallic iron. Most of it will have been tapped out of an arch in the base of the furnace, into a shallow pit alongside it. The early bloomery furnaces are very small with an internal diameter of c. 0.3m and tend to only

survive as mauve/red scoops in the ground. The poor survival of furnaces is because the temperature at the base is probably the lowest within the entire structure during a smelt, the highest temperatures will be around the air hole some way higher up the shaft.

Table 1. Catalogue of the Hand Collected Slag.

Context	Type	Count	Weight	Comments
111	FURNST	1	63g	35mm thick; 30mm vitrified.
111	TAP	53	4162g	Dense multi-layered flows; lots white fired clay + fines on base.
111	CHANNEL?	1	86g	Top flowed; base similar to a smithing slag - not moulded.
111	TAP	1	76g	Iron rich but not magnetic.
111	TAP	1	184g	No flows; smithing slag appearance on top; thick reduced clay on base.
124	TAP	3	15g	Long thin flow.
124	ORE	7	166g	Roasted; rejects?
124	ORE	5	314g	Unroasted.
124	TAP	68	4324g	Maximum 50mm thick; some large furnst inclusions; white fired clay + fines on base.
124	TAP	1	100g	Lots charcoal imprints on base.
124	TAP	2	126g	Charcoal inclusions.
124	FURNST	2	111g	Almost totally vitrified.
124	FURN	3	41g	Mass large charcoal inclusions/ imprints.
124	SLAG	1	56g	Smelting or smithing slag? Very magnetic; proto-hearth bottom shape; 40x50x35mm; lots of fines on base; bloom fragment??
124	SLAG	3	108g	Smelting or smithing slags? Proto-hearth bottom shapes; 35x50x25mm; 40x55x20mm; charcoal imprints.
126	TAP	1	22g	Flow.

CODES USED IN THE ABOVE CATALOGUE.

FURN: Furnace slag; FURNST: Furnace structure.

Table 2. Catalogue of the material recovered in Sample 1, Context 111 (10 ltr volume, 18kg weight, residue volume 7.5ltr, weight 12.4kg).

Type	Count	Weight	Comments
ORE	54	97g	Roasted.
FURNST	83	250g	Poorly wedged clay; some organic inclusions; most cream/ grey; hard fired.
FIRE	106	139g	Distinct from above - soft clay variable group; grey/ cream/ pink colours.
TAP	72	4550g	Large dense multi-layered flows; lots white fired clay + fines on base.
MISC*	2125	5416g	Most small tap, some roasted ore; fire + furnst; magnetic slag.
SLAG	2	352g	Flowed top; lots of charcoal imprints/inclusions. 1 x partially magnetic.
MAGMAT*		808g	2-7mm. Ore; tap; rare cinder, iron fragments, magnetic balls + droplets.
MAGMAT*		183g	<2mm. Ore, tap, occasional furnst and fire; magnetic balls + droplets.
TAP FLOWS	20	7g	Tiny flows, many other examples in MAGMAT.
RESIDUE*		453g	2-7mm. Majority tap, fire + furnst, ore, very little gravel.
RESIDUE*		114g	<2mm. Concreted sediment crumb, few fire + furnst and rare charcoal.
FLOT (snails)			<i>Vallonia excentrica</i> ; <i>Trichia hispida</i> ; <i>Valvata cristata</i> ; <i>Helicella</i> sp. <i>Oxychilus</i> sp.; Ostracods.
FLOT (botany)			<i>Hordeum/Triticum</i> sp.; <i>Vicia/Lathyrus</i> spp.; Cyperaceae; charred grass (indet.).

CODES USED IN THE ABOVE CATALOGUE.

\* Finds listed in the comments field are given in frequency order; FIRE: Fired clay; FURN: Furnace slag; FURNST: Furnace structure. MAGMAT: Magnetic material extracted from the residue with a magnet; MISC: Miscellaneous.

All the tap slag has the usual ropey flowed appearance that is so characteristic of this type of slag. They are generally fragments of tap plates, usually c. 25 - 50mm thick, although it is evident that they are composed of layers of flows, with earlier flows evidently having time to cool and solidify before later flows were tapped on top. The depth of the layers of slag in the tapping pit could therefore have been much deeper than these individual pieces suggest. The tops of the plate pieces are flattish but are generally composed of multiple, often quite small individual flows. Slag was

often tapped onto a bed of charcoal but in this instance the bases are covered in small pieces of ore (fines) and white/cream fragments of furnace structure and/or fired clay.

There is only one possible piece of channel-tap slag, although its base is not moulded and resembles irregular smithing slag. The top has, however, flowed. There are only three pieces of furnace slag from the site, all from context 124. This is the slag that forms and cools within the furnace base and is characterized by the large and frequent charcoal inclusions or imprints incorporated within it. Two other possible candidates (Sample 1, catalogued as 'slag') both have flowed tops but in density resemble the channel slag.

The furnace structure/ fired clays form two distinct groups but appear to be made from the same clay source. What has been classified as furnace structure appears to have a slightly higher organic content (although this maybe misleading and be natural rather than added temper) and has been less compacted or wedged, than the fired clays. The pieces of the former are generally larger than the latter, all are hard fired, and most are a buff-cream colour, being reduced fired (iron production is a reduction process). Some of the furnace pieces are deeply vitrified and slag attacked otherwise few surfaces are identifiable unlike the fired clays on which many are apparent. The fired clays also tend to be soft, are generally more diverse and some are oxidised fired. These may be from hearth structures or the remains of floors that have become fired.

It would be expected that primary smithing was undertaken at the smelting site. This is the initial smithing of the bloom to stock iron, whereas the production, repair or recycling of iron objects is known as secondary smithing. The main form of evidence expected would be hammerscale and smithing slags, but there is very little convincing evidence for this from this site. There are four possible proto-hearth bottoms amongst the unstratified assemblage from context 124, however, one is very magnetic and could be a bloom fragment. Blooms, the amalgam of iron and slag that forms within the furnace from which the iron has to be extracted, are very rare archaeological finds for obvious reasons, as any failed examples could easily be resmelted. There was only one possible piece of plate hammerscale but a quantity of spheroidal scale and metallic and non-metallic balls and droplets are present but in quite small quantities. It has been noted at some other smelting sites that spheroidal scale seems to dominate the smelting assemblages (for example Cowgill 2003b) whereas at a secondary smithing sites the plate will always be by far the more common. Spheroidal scale is produced when iron is welded and bloom smithing is primarily a welding exercise (Dungworth and Wilkes 2005), but many experimental smelters also think that spheroidal scale is produced within the furnace (pers. comm. J.G. McDonnell). There is quite a large assemblage of very small knobbly rusty brown and black slag, some of which is magnetic. It is uncertain what part of the smelting or smithing process these may be a by-product of. They could have been generated by primary smithing but equally could have formed in the furnace and be some sort of equivalent of furnace slag.

Charcoal was the sole fuel identified although imprints of it on the tap slags are rare. Large pieces are needed for iron smelting, and judging by the size of the pieces in the furnace slags these were certainly available and used. When identified mature oak is often the preferred wood for iron smelting (Gale 2003).

Lumps of both roasted and unroasted ore was recovered by hand collection and from the sample, the finer residues of the latter contain large quantities of fines (ore crumbs and dust). This is likely to be Northamptonshire ironstone, which outcrops around Stamford, and was the ore used for smelting at the 'Co-op' site (Burchard 1982).

### Discussion.

The slag recovered from pit 112 is in a very fresh condition and it is likely that it is from a primary, rather than secondary deposit. The cut feature or hollow could in fact be directly associated with the smelting activity in some way and if not, iron was probably being produced very close to it. Iron smelting slags are seldom moved any distance because of their weight and the difficulty of moving such awkward shaped material.

Although the site is undated the assemblage has many characteristics in common with three other sites that have been excavated in Stamford, where again evidence for iron smelting dominates the assemblage with very limited evidence for iron smithing. All the slag recovered from the 'Co-op' site was described as tap slag and no smithing slags or hammerscale was recorded, although the latter was sought for (Burchard 1982). Likewise the two excavations on Star Lane found very little evidence for iron smithing (Cowgill 2001b and Cowgill 2003a). The slag from all four of these sites is very dense, black and glossy and all have fines and white clay crumbs on the base of the slag (not the more common charcoal imprints). However, the assemblage from Saint George's Street, Stamford, included convincing evidence for both iron smelting and smithing, although the quantity of smithing debris was quite low (Cowgill 2001a). It would therefore not be surprising if this site was contemporary with the other examples and that a similar smelting technology was employed.

Although deposits of slag are frequently found in the town, often probably primary deposits, the furnaces in which these slags were generated remain elusive, and as far as the author is aware the 'Co-op' furnace is the only one to have been recorded by a controlled archaeological excavation. Its D-shaped form is unique in this country, most iron-smelting furnaces being circular in plan. It is therefore unknown whether this type was operating alongside the more commonly encountered circular shaft furnaces, perhaps producing a different type of iron, or if it is a regional/local form preferred by the iron masters of Stamford.

The majority of the evidence for the production of iron in and around Stamford dates to the late 9<sup>th</sup> to 11<sup>th</sup> century, but most sites have been found on the north side of the River Welland, in the north-east quarter of the town (where the pottery industry also appears to be based). This undated site, lies on the extreme south-western fringe of the medieval town quite close to the River. On the Speed map of c. 1600 the site is shown within the precinct of Saint Michael's nunnery (Mahany *et al* 1982, Plate 1A), but if it is early medieval in date, it is probable that the industry predated its establishment.

The extent and density of the early medieval settlement on this side of the River may have been considerably less than on the north, which was built on a spur over looking the River. The majority of the early Churches, the market and later castle and walled area was all concentrated on the north bank (Mahany *et al* 1982). It is tantalising to speculate that an industrial complex may have also existed on this side of the River, although currently this is the only site that allows this suggestion. The ores and clays were locally available and the proximity of the River to this site (down which all the fuel for all the industries must have been supplied from Rockingham Forest) argues for it being in a good location. The fact that it is not so close to the town allows the speculation that it was a less 'controlled' industry, perhaps owned or run as an enterprise by another or other land owners.

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## APPENDIX C - THE POTTERY ARCHIVE

*By Jane Young*

context	cname	full name	sub fabric	form type	sherds	vessels	weight	decoration	part	description	date
106	SWSG	Staffordshire White Saltglazed stoneware		small bowl ?	1	1	7		BS		18th
106	SWSG	Staffordshire White Saltglazed stoneware		?	1	1	4		base		18th
106	CREA	Creamware		bowl ?	1	1	53		base	footing	mid/late 18th to mid 19th
106	GRE	Glazed Red Earthenware		jar	3	1	12		BS		mid 16th to 18th
106	NOTS	Nottingham stoneware		hollow	1	1	6	roller stamping	BS		18th to 19th
106	WHITE	Modern whiteware		dish	1	1	1		rim		19th to 20th
106	PEARL	Pearlware		cup ?	2	1	1		BS		late 18th to mid 19th
106	PEARL	Pearlware		?	1	1	8		base		late 18th to mid 19th
106	ENG5	Unspecified English Stoneware		bottle	1	1	11		BS		late 18th to 19th
107	PEARL	Pearlware		jar ?	1	1	4		rim		late 18th to mid 19th
107	BOU	Bourne D ware		?	1	1	45		base	? ID or late earthenware garden pot	16th to mid 17th or 18th to 20th

<b>context</b>	<b>cname</b>	<b>full name</b>	<b>sub fabric</b>	<b>form type</b>	<b>sherds</b>	<b>vessels</b>	<b>weight</b>	<b>decoration</b>	<b>part</b>	<b>description</b>	<b>date</b>
110	BL	Black-glazed wares	Bourne/local ?	jar	1	1	32		rim		mid 17th to 18th
125	ENGSS	Unspecified English Stoneware		jam/lard jar	1	1	28		base		late 19th to 20th
125	BOUA	Bourne-type Fabrics A, B C and C		vessel/cbm	1	1	37		BS	odd as cut edge;glaze;poss roof furniture	13th to 15th
125	FREC	Frechen stoneware		drinking jug	1	1	6		BS	mottled glaze	mid 16th to 17

## APPENDIX D - THE TILE ARCHIVE

*Jane Young*

context	cname	full name	fabric	frags	weight	description	date
106	PNR	Peg, nib or ridge tile	dull OX/R/OX sandy	1	21	mortar	13th to 18th

## APPENDIX E

### THE OTHER FINDS (WITH FURTHER POTTERY)

*by Paul Cope-Faulkner and Gary Taylor*

Recording of the pottery was undertaken with reference to guidelines prepared by the Medieval Pottery Research Group (Slowikowski *et al.* 2001) and the pottery was quantified using the chronology and coding system of the Lincolnshire ceramic type series. One fragment of pottery weighing 3g was recovered. In addition to the pottery, a small quantity of other artefacts, metal and clay pipe, comprising 8 items weighing a total of 197g, was retrieved. Faunal remains were also recovered.

The excavated animal bone assemblage comprises 18 stratified fragments and 1 of unstratified bone weighing 161g. The animal bone was identified by reference to published catalogues. No attempt is made to sex or age animals represented within the assemblage, although where this is readily apparent is noted in the comments column.

#### **Provenance**

The material was recovered from topsoil (102, 103, 106), probable ditch fill (107, 109) and as unstratified artefacts (100, 125).

The pottery is a Staffordshire product, though the clay pipe was probably manufactured locally in Stamford.

#### **Range**

The range of material is detailed in the tables.

*Table 1: Pottery*

Context	Fabric Code	Description	No.	Wt (g)	Context Date
103	LPM	Blue sponged ware	1	3	Early-mid 19 <sup>th</sup> century

*Table 2: Other Artefacts*

Context	Material	Description	No.	Wt (g)	Context Date
100	Iron	Nail, 2", 20 <sup>th</sup> century	1	4	20 <sup>th</sup> century
	Iron	Wire spike with circular loop at head (surveyor's arrow?), 19 <sup>th</sup> -20 <sup>th</sup> century	1	23	
	Iron	Machinery part, 19 <sup>th</sup> -20 <sup>th</sup> century	1	45	
	Copper alloy	D-shaped disk with drilled hole, machinery part, 20 <sup>th</sup> century	1	6	
102	Clay pipe	Stem, bore 7/64"	1	3	17 <sup>th</sup> century
106	Clay pipe	Stem, bore 5/64"	2 (link)	4	18 <sup>th</sup> century
107	Iron	Rod, 180mm long, square sectioned, 10mm across, tapering slightly to 1 end	1	112	

Most of the metal finds are clearly modern and could be discarded.

*Table 3: The Faunal Remains*

Context	Species	Bone	No.	Wt (g)	Comments
103	cattle sized	Metacarpus	2(link)	10	
107	cattle sized	rib	2		chalky
	cattle sized	unidentified	1		chalky
	sheep sized	incisor	<1	10	
	oyster	shell	1		

Context	Species	Bone	No.	Wt (g)	Comments
109	cattle sized	rib	5	78	sawn ends
	cattle sized	vertebra	2	11	juvenile
	sheep sized	rib	6	14	sawn ends
125	cattle	molar	1	38	

In addition to the bones from (109) there is a small bag of unwashed material. This includes vertebra and rib fragments. The frequency of sawn ribs from this context indicates it is probably derived from butchery at or in close proximity to the site.

#### Condition

All the material is in good condition and presents no long-term storage problems. Archive storage of the collection is by material class.

#### Documentation

There have been numerous previous archaeological investigations at Stamford that are the subjects of reports. Additionally, there has been reported study of the archaeological and historical evidence for the town and its vicinity. Details of archaeological sites and discoveries in the area are maintained in the files of the South Kesteven Planning Archaeologist and the Lincolnshire County Council Sites and Monuments Record.

#### Potential

The collection is mostly of early modern date, with a few post-medieval pieces. As such the assemblage is of very limited local potential and significance, though indicates use of the site in the 17<sup>th</sup>-20<sup>th</sup> centuries. Almost all the metal is clearly modern and could be discarded.

The lack of any material earlier than the 17<sup>th</sup> century is informative and suggests that archaeological deposits dating from prior to this period are absent from the area, or were not disturbed by the development, or were of a nature that did not involve artefact deposition.

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