Hudson House, York

Archaeological Report Part 2: Assessment of Finds

LS Archaeology

Site	Hudson House, Toft Green, York YO1 6JT
Site Code	HHY18
County	North Yorkshire
NGR	SE 59739 51628
Planning Application Reference No.	17/00576/FULM
Development	Erection of 4 buildings comprising of 127 flats (C3), office (B1) use, and office or restaurant (B1 or A3) uses, following the demolition of existing office buildings
Images and text	LS Archaeology Project Manager: D Signorelli
Month of Issue	March 2020
Site Dates	Trial Trenches: 28/01/17-30/01/17 Strip Map and Record: 05/02/18-05/03/18 Watching Brief: 01/07/18-30/11/
Client	Palace Capital Developments Ltd

Summary

This document contains the finds and sample reports produced by the team of specialists who evaluated assemblages from the excavations at Hudson House. The following assemblages and sample types were assessed:

- Faunal Remains
- Glass
- Medieval and Later Pottery
- Conservation
- Metal and non metal Small Finds
- Roman Pottery
- Samian Pottery
- Slag
- Heavy Metal Drain Sediment Analysis
- Mortar Analysis
- Biological Remains
- Lithics
- Building Materials

CONTENTS

THE FAUNAL REMAINS

Ewan Chipping

Introduction

The assemblage of faunal remains, amounting to 1 box, was recovered by L.S. Archaeology in 2018 during excavation at the Hudson House site in the western side of York. The assemblage came from a single area, occupied historically by a modern office block and previously the former railway. The assemblage generally dated from the Roman and Post-Medieval/Early Modern periods. That being said the majority of faunal remains were recovered from the fills of one pit features (contexts; 250 and 252). Besides this no real spatial division is seen within the site with all areas yielding bone from all periods. The animal bone was examined by the author in spring/summer 2019, a total of 1718 fragments were recorded from 28 contexts. The assemblage is of a moderate size considering it is located within the city walls and c.500m from the centre of Roman York (Eboracum) and within the industrial railway expansion of York, with over three quarters of the bone archive dating to the Roman period.

Methodology

The majority of animal bone submitted for examination comprised bones of medium and large vertebrate species collected by hand during the excavation. As such a collection procedure is well known to produce an assemblage biased towards larger boned mammals (Payne, 1975), sensitive contexts were also wet sieved through a 5mm mesh on site to assist recovery of smaller material.

Vernacular (common names) of taxa are used throughout the text, checklists of the taxa referred to can be seen in table 1 and skeletal element representation in table 2. Identification was carried out by comparison to the University of York reference collection and personal reference collections. Among the ovicaprids, only sheep was positively identified, thus it is possible that the bones of goats are present in the sheep/goat category, oviparid bones are collectively referred to in this report as sheep.

Detailed recording of the assemblage was undertaken in Microsoft Excel, elements which could be identified were quantified to include; species, element, number, side, taphonomy and pathologies. Skeletal element representation for the major domestic species was undertaken using the number of identified specimens (NISP) as the basic unit in counts. Semi-subjective, non-quantitative data were recorded for the material from each context regarding the state of preservation, colour, and the proportional completeness of elements (table 3). Additionally, for the bone from each context, semi-quantitative information was recorded concerning dog gnawing, burning, butchery and fresh breakage. Other fragments, (classified as ‘unidentified’) were, where possible, grouped into categories: large mammal (assumed to be horse or cow), medium mammal (sheep/goat, dog, cat etc.), small mammal (rodents), unidentified bird, unidentified fish and totally unidentified.

Capra/Ovid and cattle tooth wear stages were recorded using those outlined by Grant (1982). Cattle, pig and Capra/Ovid mandibles were assigned to the general age categories outlined by O'Connor (1989). Mandibles with incomplete tooth rows where numbers of teeth missing were too great to confidently assess wear were not assigned to age groups. Mammal bones were described as 'juvenile' if the epiphyses were unfused and the associated shaft fragment appeared spongy and porous. They were recorded as 'neonatal' if they were also of small size and identification using Prummel (1987). Epiphysial fusion data are presented using the categories of O'Connor (1988).

Due to the reasonably isolated occurrence of complete skeletal elements no attempt was made to take measurements.

Phasing and grouping

In order to summarise the results obtained from analysis of the animal bone, it is necessary to group some quantities of faunal remains of the same period, phase or area. Results from individual contexts are seldom considered in this report unless significantly noticeable or stratigraphically discrete. Consequentially to assist in the wider investigation and to manage the number of fragments, NISP counts for periods have been grouped. Animal bone by context is included for reference in appendix 1.The intention is to give a useful chronological resolution to the result and make it comparable with other sites in York to assess the importance of the assemblage.

Site by chronological phase

Roman

Taphonomy

A total of 1482 fragments were recorded from deposits dated to the Roman period. The physical appearance of the remains was the most consistent of any period suggesting a stability in in the sediment matrix in which the bones were buried. This resulted in predominantly well-preserved fragments generally light brown in colour. This is generally suggestive of a reasonable neutral depositional environment with some drainage and oxygenation of sediments. A small number were in poorer condition being tan in colour, more pours and 'speckled' possibly indicating this was their secondary burial environment or sitting within the water/mineral flow level. Fragmentation was observed to be high with 78% categorised as ¼ or less complete (table 3), this might be resultant from human cultural practice and butchery as 460 bones (31%) were noted to have cut or chop marks on them. The cut marks were typically placed on the vertebrae, ribs, major long bones and towards the wrist and ankle joints indicative of standard butchery practice. In addition two fragments, both red deer antler, were also notes as being sawn. There was a low incidence of gnawing observed on long bones of the main domestic species, all gnawing was by canids with one particularly large grooving on a cattle proximal humerus epiphysis (Plate 4) A few fragments were burnt, being black in colour.

Results and discussion

The Roman material dated to between the 1st and 5th centuries AD, with the consensus of dates around 3rd to 4th century AD. In total nine species were identified to species level, with other more general identified. From this material 93% comes from two contexts (250 and 252) within a single pit feature (251), as this was

the dominant feature for this period detailed consideration is given below. For the other Roman material (excluding contexts 250 and 252) small amounts of material came from fills 258 and 270, from deposits 267, 268, 286 and 375, and excavation area 472. In these were present cattle and pig are present in near equal numbers, along with slightly smaller numbers of sheep. Of note in context 267 were three cut deer antler (likely red deer although roe deer cannot be ruled out) and a hare phalanx bone, these were accompanied amongst the general cattle, pig and sheep fragments. As so few bones were recovered little can really be said regarding Roman cultural practice regarding animals. On a general note the proportions of cattle, pig and sheep bones falls in line with the other sites in York (O'Connor, 2000). Elements present are reasonably balanced between all parts of the skeleton with a slight weighting towards long bones.

Pit feature 251 – fills 252 and 250

The primary (252) and secondary (250) fills of pit 251 contained large numbers of faunal remains including quite a diverse range of species. The lower fill had fewer bones (total 396) of which the highest proportion were attributed to pig phalanx and carpals/tarsals but also other long bones (mostly lower limbs) and some lose teeth. There was also a number of foetal/neonatal pig remains (NISP = 23) considered to be c.100-200 days old at death. Cattle (NISP = 23) and then sheep (NISP = 11) were next most prevalent, with a representation of all major skeletal elements, again with perhaps a slight weighting towards lower limb bones. There were also some elements of chicken and another bird only identified as far as 'waterfowl'. A mole humerus was also recorded although thought to be intrusive as the preservation was a little better than the other context bones. In addition to the identified elements 26 fragments were recorded as coming from 'large' animals and 48 from 'medium'. Fragmentation was high in the context so 212 elements were not identifiable to any species of bone element.

The upper fill of the pit (250) contained the majority of bones from pit 251, a total of 976 fragments. Similarly to the earlier fills, pig remains predominated (NISP = 149) with a focus on elements from the lower limbs although most skeletal elements were represented. There was a high proportion of foetal/neonatal elements (NISP = 40) considered to age from c.50 days to c.200 days old at death. Cattle (NISP = 102), chicken (NISP = 17) and sheep (16) were the next most prevalent species respectively. The cattle remains had a very general distribution of all skeletal elements present but primarily limbs, the chicken elements were from the wings and legs and sheep a general distribution again although a number of horn cores were noted. Other species were present in smaller numbers including deer (NISP = 9, of which NISP = 5 were red deer) all elements from cut antler pieces (Plate 3), horse (NISP = 2), dog (NISP = 2) and bird bones that could not be identified beyond basic categorisation into 'fowl' (NISP = 4) and bird (NISP = 3). There were also a number of smaller fragments identified as coming from 'large' (NISP = 196), 'medium' (NISP = 89) and 'small' (NISP = 1) animals although further information was not obtained. In addition 386 fragments were not identifiable to species or skeletal element.

Plate 1: Tibia (left) and astragalus (right) of horse with cut marks from context 250

Cattle bones exhibit the most evidence for butchery in the method commonly found on Roman period sites used to dismember the main meat bearing elements. While it has been noted that not all Roman period carcasses were butchered in the same way, with some having had the major meat muscles removed from the bone producing intact bone waste (O'Connor, 1989), this does not seem to be the case at this site with bones chopped through. Butchery evidence on sheep and pigs was much more uncommon, with only 3 and 6 fragments respectively showing evidence. In the case of sheep this is presumably related to their relative contribution to diet compared to their importance as textile producers. Furthermore the relative ease at which a medium size mammal could be dismembered with a knife with little need to chop through bones, leaving little or no trace on the skeleton. The lack of butchery has also been used to suggest that sheep could have been distributed in parts such as a quarter to a household, rather than smaller joints (O'Connor, 1989). The pattern of butchery seen is consistent with the intensive 'industrial' style Roman pattern where carcases were systematically reduced into small portions. While on initial inspection is seems that domestic species phalanx and lower limb bones (carpals, tarsals, metapodials) are the most prevalent elements, upon reflection it seems that long bones/limb bones generally were frequent when skeletal elements identified to size group only are considered. This creates a common but distinctive assemblage of small shards of long bone from the major limb elements (humerus, radius, femur and tibia). Some other species were noted as having cut marks such as horse bones (Plate 1), possibly eaten in this period, until the papal decree of 732 AD drove it out of fashion, or used as dog feed. A dog bone was also found with cut marks (Plate 2) possibly for the skin but there is some evidence of dogs being consumed by the lower classes (deSandes-Moyer, 2013).

Plate 2: Dog humerus with cut mark from context 250

The pigs however are slightly different given the number of foetal and neonatal bones it seems we are seeing either the slaughter of young pigs or the natural death of very young piglets as is common in mortality profiles. Pigs would have been kept by households as an inexpensive food animal and likely a common sight in Roman York. The eating of young pigs is known from literary sources (Alcock, 2001) and may have carried significant messages regarding not only the status but the identity of the consumers and associated with a Romanized diet (Gerard, 2007). From the remains it can be seen that in context 250 the minimum number of individuals (MNI) for young pigs was 5, and for context 252 the MNI was 2. Unfortunately, it is uncertain if these were resultant from a single feasting episode or from multiple households refuse incorporated into the same disposal dump.

The site is located within the limits of the Roman settlement that grew around the fortress, close to a former Roman road running north east to south west between Tanner Row and Micklegate (Ottaway, 2009) so it is not surprising to find deposition in this area as Roman roads are often focal points of activity. The Roman faunal assemblage at Tanner Row produced low quantities of young pig remains leading to the suggestion that there was a trade of young pork in Roman York (O'Connor, 1988). Of the Tanner Row Roman period assemblage pig remains comprised 12% of the total fauna, the Hudson House assemblage was a little higher at 15% pig. However when we look at the proportions cattle to pig a different picture emerges; at Tanner Row we see a ratio of 1:5 pig to cattle however at Hudson House we see a ratio of 8:5 pig to cattle. Furthermore, excavations at York Minster also recovered a 'small pig horizon' believed to be the eating of animals yet to reach their economic optimum in terms of meat yield (Phillips and Heywood, 1995) but undertaken by some form of elite capable of controlling surplus (Gerard, 2007). In addition to this, and given the late Roman date of the assemblage c.3-5th century, it was suggested the dietary preference for young pig was a way of associating with a Roman past (Gerard, 2007) as York entered a more transitionary stage away from the legionary fortress into a Romano-British and then Early Medieval town.

Plate 3: Deer antler examples from context 250

Post-Medieval and Early Modern (18th to 20th Century)

Taphonomy

The physical appearance of the remains was much more variable than the earlier material, ranging from dark brown and pours to pale tan and well preserved. A few fragments had mineral concretions on them suggestive of changing wet conditions. Fragmentation was high with 90% of the fragments categorised as ¼ or less complete (table 3). Consistent to earlier periods a small number of fragments were noted as being 'mottled' or having mineral concretions, indicating a varied depositional environment with fluctuating hydrology. Virtually no fragments had animal gnawing evidence. Possibly bones were being immediately buried and so were not accessible to scavenging animals.

Results and discussion

The Post-Medieval and Early Modern faunal assemblage totalled 208 fragments, from these 7 species were positively identified from the assemblage, along some fragments to genus (table 1). Cattle were the most abundant species for this period (NISP = 13), with a relative decrease in the abundance of pig (NISP = 8), and sheep (NISP = 6). Chicken were also present in low abundancy (NISP 3), there were two other bird bones were present one likely to be some kind of domestic fowl and the other not identified in terms of species. Hare, a deer antler (likely red deer) and a fragment of human skull were also represented by a single fragment each. Other elements were categorised as belonging to large animals (NISP = 28) and medium animals (NISP = 32), completely unidentified bone fragments were 111 total.

Plate 4: Cattle humerus with dog gnaw marks from context 250

Butchery evidence was only noted on cattle (8 incidences), pig (1) and sheep (3) bones totalling 56 cut elements. In addition, the large animal bones group exhibited 19 cut marked bones and medium group 25 cut marked bones. Furthermore the element distribution is reasonably even with all skeletal elements represented. It is therefore difficult to make sensible assessment of butchery or dietary preferences. If we also consider the unidentified large mammal bones are likely cattle, there is then a clear preference for long bones, ribs and vertebrae which are the common main meat bearing elements exported from a butchers shop. The prevalence of cattle for this period is interesting given the trend for sheep seen elsewhere in York (O'Connor, 1984), however the limited size of the assemblage makes detailed assessment if difficult and may be a fragmentation bias when we consider the large count of the medium sized animal group.

The majority of this period's assemblage (83%) came from a single context, deposit 249, which was a grey deposit across the top of pit 251. It seems likely that this was a spread of domestic refuse given the variation of species, skeletal elements present and fragmentation. For the remaining bones from across the site given the spatial distribution in small numbers it is reasonable to suggest they represent general domestic rubbish from this period, possibly discarded casually or residual from the area before being incorporated into features. In comparison with other sites of this period there is a relative dearth of taxa present, sites such as Fishergate (O'Connor, 1991) or Walmgate (O'Connor, 1984) in York yielded numerous bird bones including those still exploited as game today along with small mammals such as rabbit. At this time meat would likely have been provisioned from a general market so the prevalence of cattle and lack of game species may be somewhat representative of dietary choices for the associated residence. The remains are not considered to relate particularly to the sites former use as a railway station.

Undated

In addition the dated material there was 28 bone fragments with no date from 9 contexts. This were generally split among the same taxa as seen in stratified contexts and included many of the species already identified at the site (cattle, pig, sheep, birds) and in addition 6 rat bones from the pelvis, femur and tibia. No detailed analysis is made given the lack of temporal information but the species and elements are

displayed in table 1. Of note is a perforated sheep radius from context 229 (Plate 5), where a square hole was made in the approximate centre of the bone. The hole seems to have been 'cut' rather than drilled given the angular nature and noting the slight breakage of bone on the anterior surface it is suggested it was cut from the posterior side. It is uncertain what this culturally modified bone was used for, such 'hole bones' are seen throughout history and have functions from weights to tool handles. Coming from an undated feature it is not possible to further elucidate its intended purpose.

Conclusions and summary

Bones recovered from the Roman and Post-Medieval and Early Modern deposits at Hudson House site represent a snapshot view into the past history of York. Due to the low numbers of bones and the relatively singular nature of the features containing faunal remains we are capturing information about the butchering and deposition only. That being said, the assemblage does seem to represents a broadly typical Roman and Post-Medieval assemblage comparable with others of this period from York. The majority of deposits were a combination of good to poor preservation, with no real differences in early or later period suggesting a reasonably stable soil matrix. This would be consistent with bones being deposited either with little organic components or as a secondary deposit from elsewhere following a process of decay already. The lack of gnawing on bones does suggest however that if secondary deposition was occurring it was quickly or kept inaccessible to dogs, cats, rodents ect.

Plate 5: Sheep radius anterior view (top) and posterior view (bottom) with perforation in centre from context 229

Period for period differences in the assemblage are not attempted due to the considerable time difference between the Roman and Post-medieval assemblage. Just to note however from the Roman period there is an interestingly high number of very young pig remains but then with predictable numbers of other domestic species. This is probably related to the animal meat supply from the agricultural hinterlands of York, an area of damp lowland pastures where grazing of large mammals is plentiful. However from the 16th century the cattle dependency decreases in magnitude an increase in sheep, perhaps indicating a rise in trade networks with exchange distances reaching into the uplands surrounding York. This is also possibly

linked with a rise in wool trade boosting the numbers of sheep available. While sheep were not the most abundant species identified in post-medieval contexts, coming in after cattle and pigs, if we consider the number of medium sized bones this would perhaps begin to indicate their popularity.

With regards to other species found at the site, there is some evidence that pigs, geese and fowl were kept within the city or could be obtained close to York throughout these periods. Such animals are small and easily kept as 'yard pets'. Thus the population likely had some access to food and was not wholly depended on hinterland farms. The numbers of very young pigs may provide evidence that breeding sow pigs were being kept and reared in or very near the city in the Roman period which has been previously speculated (Maltby, 1994). It is suggested that pig this young (a few month old) would have been eaten as 'suckling pig', the majority of evidence from York suggest pig slaughter happening in prime meat animals as sub adults (O'Connor, 2000). There are instances of young pigs being found in larger numbers such as at York Minster, and even suggestions that slaughter of larger number of animals required some degree of oversight from a controlling class who related back to a more Romanized lifestyle. It is suggested this was occurring during the transitional decline of the Roman Empire, with wider structural transformations with their origins in the 3rd or 4th centuries (Petts, 2016). The pig remains therefore make this assemblage quite distinct for York, but by no means an isolated case.

Animals such as horses, dogs and deer were present in consistently small numbers seeming to represent a general background signal of such species commonly found in cities. The presence of Roman horse remains all bearing cut marks is interesting as it has been suggested they were not consumed, unless for dogs (O'Connor, 2000). The deer assemblage being comprised wholly of antler is also consistent with the record for York (O'Connor, 2000). Deer antler would have been used for various craft and industrial activities, the assemblage from the site seems to mainly comprise 'off cuts' and tips of antler tines seemingly waste material.

From the small and mixed nature of this assemblage it is difficult to interpret the assemblage in terms of its accumulation and representation to cultural activity. This is further compounded by the fact the majority of bones in the Roman and Post-medieval assemblage come from a single feature respectively. The Roman material is reasonably typical, and with the exception of the high number of very young pig remains, characterised by the presence of a dump of bone debris butchered intensely into small 'chunks' of meat and causing high bone fragmentation. The post-medieval remains are even more difficult to interpret give the very low numbers, but seen to conform to other sites in York. For both periods it is suggested that a domestic provenance is most likely. The inclusion of some deer antler waste could suggest craft or cottage industry or secondary reburial of material from industrial and domestic deposits, with refuse coming from several different sources. The assemblage has a resemblance to other sites in York, of a prosperous later Roman settlement developing into a large Post-Medieval city. It is however obvious that the site was in the fringes of the main urban development until more recent times given the size and seemingly domestic nature of the assemblage.

Retention recommendations

Guidance regarding retention and discard is given by Historic England (2014, 24) against which a suitable policy for the Hudson House assemblage is considered. The assemblage is regarded to have a moderate to high significance both on an intrinsic and extrinsic basis. The site itself seems to be broadly typical for York when considered against the wider site context as characterised above. However given the presence of

young pig remains in reasonably high numbers from an isolated Roman deposit, this assemblage is thought to still hold value given York's colourful past particular relating to these periods. Furthermore, the site is located in an area patch worked with archaeological investigations on a relatively small scale as is common in urban environments so there is the potential for reanalysis in the light of future discovery. On a methodological note the recording approach adopted here was a 'broad brush' analyse to examine all the material and condense this into a manageable report. While this is considered suitable to successfully characterise the assemblage, it is likely further information could be obtained from the bones driven by an alternative research agenda. When considering the moderate assemblage size it is also apparent that the time taken to create a suitable record (as per Rainsford *et al*, 2014) prior to discard would be more exhaustive then of worth given the small percentage of the bones that would be lost. Therefore at present it is recommended full retention and storage should be made.

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Appendix 1

Roman

Context	*Bos taurus*	*Ovis/Capra*	*Sus scrofa*	*equus*	*Canis familiaris*	*Gallus gallus*	*Galliformes*	*Anseriformes*	bird	*Lepus*	*Cervus elaphus*	*Cervid*	*Talpa europaea*	large	medium	small	unid	Total
250	102	16	149	2	2	17	3	1	3		5	4		196	89	1	386	976
252	23	11	71			3		1					1	26	48		212	396
258														2				2
267	2	1	3					1		1		3		8	2		3	24
268	5		4									1		6	16		11	43
270		1							2						2		2	7
286	3													1			3	7
375	4	2	2						1					8	5			
472		1													2			3
489														2				2
Total	**139**	**32**	**229**	**2**	**2**	**20**	**3**	**3**	**6**	**1**	**5**	**8**	**1**	**249**	**164**	**1**	**617**	**1482**

Post-Medieval and Early modern

Context	bird	*Lepus*	*Bos taurus*	*Gallus gallus*	*Cervid*	*Equus*	human	large	medium	*Sus scrofa*	*Ovis/Capra*	unid	Total
4								1					1
5									1				1
144		1	1						1	1	2	2	8
145			1										1
249	1		11	3	1	1		19	24	7	3	104	174
290						1							1
291							1	1					2
373	1							4	3				8
392								3	3		1	5	12
Total	**2**	**1**	**13**	**3**	**1**	**2**	**1**	**28**	**32**	**8**	**6**	**111**	**208**

Undated

Context	bird	Bos *taurus*	large	medium	*Sus scrofa*	rat sp	s*Ovid/Capra*	small	unid	Total
4		1	1							2
10			1							1
204			1							1
229							3			3
364		1								1
367			1							1
481			5				1		2	8
514				4		3		2	1	10
433/436				1						1
Total	**1**	**6**	**17**	**10**	**2**	**3**	**6**	**2**	**3**	**50**

GLASS

Dr. Rose Broadley

Report

The highlight of the glass assemblage from Hudson House, York, is a small, colourless fragment from a Roman cup or bowl. The fragment has a rim that was cracked off and ground, and curves outwards and upwards just below the rim, creating a profile characteristic of a range of convex bowls and cups. This example dates to between the mid second and fourth centuries, and represents a piece of good-quality dining-ware. The fragment was found in the secondary fill of a possible cess pit (context 250), which also contained pottery, animal bone, and oyster shell. The other three vessel fragments from the site that are definitely of Roman date are from the primary fill of the same pit (context 252), where the glass fragments were associated with similar material as in the upper fill. They are all very small body fragments, two of which are colourless and one pale blue-green. The pale blue-green fragment appears to have a band of linear abraded decoration, although the area is now partly obscured by surface lamination. All are likely to be from delicate tablewares, probably drinking cups or small bowls. The pit is part of a tiny section of Roman stratigraphy that survived the levelling of the area in the nineteenth century.

There are two further vessel body fragments from context 267 that could be Roman glass – the fragments are cloudy, colourless and blue-green respectively. The context is an irregular refuse dump of dark matter that also contained pottery and animal bone – similar to contexts 250 and 252, except that the glass fragments in this case are smaller and have no diagnostic features. Contexts 252 and 267 also contained one small fragment of Roman window glass each, which indicate the previous existence of a glazed Roman building in the vicinity. A final possible fragment of Roman window glass was found in context 249, although both surfaces are abraded and no original edges survive, so it is very difficult to be sure.

The bulk of the glass from the site is largely late-nineteenth and early-twentieth century in date, and is very probably associated with the construction and operation of the nineteenth-century railway and station nearby. A total of 50 vessel glass fragments weighing 1730.4g were excavated, most of which were bottle glass dating to between the 1840s and 1920s. There are groups of seven fragments of Hamilton or similar soda-type bottles; five turn mould bottle fragments, including two featuring a base with a steep kick-up and a mamelon in the centre that date to c. 1880-1920 (contexts 4 and 144); and three champagne-type bottle fragments. The contexts with the largest numbers of vessel (or non-window) fragments are context 4 with 18, context 144 with seven, and context 33 with four.

Eight bottle fragments feature embossed letters, but none enough to speculate on the original names or words present. There is also a base fragment from a jar that probably dates to the first half of the twentieth century has the mould number ‘6561’ embossed on the base. The bottle fragments include three bottle ‘rims’ types – usually called closures or finishes - an olive-green fragment featuring a ‘Champagne’-type finish (context 4, the site hand-cleaning layer), a balanced 'blob finish',

most commonly found on soda and mineral water bottles from the 1840s-c. 1920 (context 5), and a colourless fragment from a crown finish (context 33). Also from context 4 is a fragment from the shoulder of a Codd bottle, preserving part of the marble chamber and part of the space below for liquid, embossed '…H & T…'. Codd marble bottles were invented to contain carbonated drinks in the 1870s.

A few fragments are not from bottles, including a fragment probably from near the base of a dimpled pint glass, which dates it approximately to the first half of the twentieth century (from context 85); a fragment of deep red glass with a pressed design of concentric ridges on one side, which is probably from a dish or plate dating to 1924 or later (when mass-produced pressed red glass became technologically possible in the UK); and a pale green fragment with a sheared-off knob or handle that probably comes from a nineteenth-century glass cloche (both from context 144). The contexts 85 and 144 are both rubble base layers for concrete slabs and buildings.

A total of 144 fragments of late-nineteenth to early twentieth-century window glass fragments were excavated, weighing a total of 2016.8g. A large quantity of obscured window glass was found in contexts 3, 4 and 33, totalling 121 fragments. They are all 7mm thick and have narrow linear ridges moulded onto one side. This type of obscured glass was mass-produced from the mid-nineteenth century onwards. In addition, two fragments of thick, colourless wire mesh glass were found in context 5, and the wire-mesh technique dates this to c. 1896 onwards when glass of this type was first produced. Both the wire-mesh and the obscured glass are more likely to have come from work place settings than domestic residences.

Overall, the glass assemblage reflects the wider archaeology and history of the site. A tiny amount of Roman dining waste, including at least four fragments of glassware, survived the clearance and levelling of the site in the nineteenth century and its subsequent use in relation to the nearby railway and station. A much larger nineteenth and early twentieth-century glass assemblage is dominated by bottle glass and industrial window glass, probably reflecting a connection to the railway station and position almost opposite it.

Archiving and curation

All of the Roman and probable Roman fragments should be retained. Potential for further research into the post-medieval window glass is low and it is not necessary to retain it. If space allows, retention of the diagnostic post-medieval vessel glass (e.g. bottle rims, embossed fragments, and the non-bottle fragments such as the one probably from a cloche) is recommended.

Medieval and later pottery

C.G. Cumberpatch BA PhD

Introduction

The medieval and later pottery assemblage from Hudson House, York (HHY18) was examined by the author between the 24th May and 5th June 2019. It consisted of 253 sherds of pottery weighing 5000 grams representing a maximum of 235 vessels. The assemblage also included a substantial quantity of Roman pottery which is the subject of a separate report. The data are summarised in Table 1 with other material (sewer pipe and wall tile fragments) listed in Table 2.

The pottery

The earliest pottery in the post-Roman assemblage was of medieval date and was, in all cases, associated with later material, suggesting that it was residual in character.

The earliest sherd was the rim of a York A ware type jar from context 249 dating to the late 9th to mid 10th century. Somewhat later in date was a sherd of Slightly Oxidised Splashed ware type (SOX) from context 291 (Mainman and Jenner 2013: 1190) dating to the mid to late 12th century. Other sherds were all of later medieval date and included a small piece of probable Humberware type (context 373) with sherds that could not be identified to specific types from contexts 11 (Reduced Sandy ware) and 291 (Late Medieval Sandy ware). All of these wares were represented by body sherds and it was impossible to determine the vessel types involved.

Two sherds of Green Glazed Sandy ware of later medieval to early post-medieval date were identified in context 392 with a further body sherd of the same type from context 7. One of the former sherds was the base of a hollow ware vessel, the other was part of a lid with a body sherd from a dish or bowl from context 7. Although lid-seated rims are not uncommon on medieval vessels, ceramic lids are far less common, suggesting that most were made of wood. This example showed a pattern of sooting concentrated around the outer edge, perhaps suggesting that it had sat on top of a rim rather than in a lid-seat, although this would not seem to be a particularly secure practice.

Later post-medieval pottery included a sherd of 17th century Blackware from context 144 and possibly the handle from a Redware type vessel (probably a jug or handled jar) from context 7 although this could be of early modern date, consistent with the remainder of the pottery from the context, as described below.

Early modern pottery (c.1720 – c.1840) was more abundant than that from earlier periods and included examples of two of the three principal classes of ware; formal and vernacular tableware. Utilitarian ware was notable by its absence.

Formal tablewares was limited to two sherds of Creamware from context 144 but vernacular tablewares (as defined elsewhere; Cumberpatch 2014) were rather more common. Late Blackware, one of the commonest of the vernacular tablewares, was identified in contexts 7 and 144 with two bowl rims and a jar rim in the latter context. Late Blackware is characterised by its fine red fabric and the use of black glaze internally and externally above the base and lower body. The type owes something to the earlier Cistercian and Blackware types, the principal differences being in the lower-temperature firing of the body and the distinctive pattern of glazing.

Contexts 7 and 249 both contained sherds of 18th century Slipware, the former from a typical press-moulded dish and the latter from a mug or porringer. The fabrics differed slightly from each other suggesting two different sources for the vessels. Although Slipwares are often assumed to originate in Staffordshire, the environs of London or the Bristol area, the evidence from Yorkshire shows that they were also made elsewhere and it seems more than probable that such country potteries flourished throughout the country, either as family-run businesses or established with the support of local entrepreneurs (Cumberpatch 2014). Other common types, such as Mottled ware and Slip Coated ware were notable by their absence but this is probably of little significance, given the small size of the assemblage.

The greater part of the assemblage was of 19th century date and included a wide range of types typical of the recent period.

Utilitarian wares included Brown and Yellow Glazed Coarsewares, the latter particularly common (as discussed below), Brown Salt Glazed Stoneware and Unglazed Red Earthenware.

Brown Glazed Coarseware was present in contexts 144, 288, 343, 353 and 373 with three sherds from pancheons and two from hollow wares. The small number of sherds is unusual as Brown Glazed Coarseware is normally much commoner than Yellow Glazed Coarseware, at least on urban sites. In this case Yellow Glazed Coarseware was present in contexts 288, 348, 4, 71 and 291. Context 348 was particularly notable as it contained 198 sherds although these were probably from as few as four or five vessels, all pancheons, including at least two with loop handles. A pancheon distinguished by the use of clear rather than brown glaze, giving a Redware-style finish was identified in context 343.

Unglazed Red Earthenware sherds were recovered from contexts 11, 291 and 392, with a small concentration in context 11. All of the vessels were flowerpots and of mid-19th century or later date.

Stonewares include both salt glazed and lead glazed types, the former from contexts 255 and 291 and the latter from context 4. Hollow wares, a probable jug and a flagon were all represented.

The majority of tablewares were of later 19th to early 20th century date with Bone China the commonest body (contexts 4, 11, 144 and 290). The majority were plain although a cup was decorated with red lines below the rim and a larger vessel, probably a mug or jug bore a leaf and foliage design externally. Whitewares were represented by four sherds from contexts 5 and 144. One of the sherds from context 5 carried a transfer printed design (Willow) while two of the plain sherds had moulded relief decoration.

Context 145 contained two sherds of Cane Coloured ware; both from the rim of a pie dish or pie dishes, a form commonly found in this distinctive body.

Discussion

Although small in size, the assemblage included pottery from a wide range of diverse contexts. The following notes describe the pottery of medieval and later date context-by-context. A number of these contexts also contained Roman pottery, presumably as a residual element in later features. Although sherds of medieval pottery were identified in the assemblage (as described above) all of these sherds were associated with later pottery.

Context 4

Context 4, a cleaning layer, produced a small group of 19th and early 20th century sherds with Bone China tablewares prominent amongst them. Utilitarian wares were limited to two pieces of Stoneware and the base and handle from a Yellow Glazed Coarseware handled bowl.

Context 5

Context 5, a deposit consisting of brick and mortar, contained a small group of sherds of mid to late 19th century date. All were Whitewares, one transfer printed and two with relief moulded decoration.

Context 7

Context 7, the cut for structure 9, contained a small assemblage of late post-medieval and early modern sherds. The absence of later pottery was notable but the small size of the assemblage means that residuality cannot be entirely ruled out as an explanation for their presence.

Context 11

Context 11, a brick culvert structure, contained an assemblage consisting primarily of fragments from broken flowerpots with part of the base of a contemporary bowl in Bone China and a residual late medieval sherd dating to the 14th or 15th centuries.

Context 71

Context 71, a sondage, produced a single sherd of Yellow Glazed Coarseware dating to the 19th century.

Context 144

Context 144, a deposit of rubble, contained an interesting mixed assemblage which included post-medieval, early modern and recent wares. Although the presence of Whiteware, Bone China and Brown Glazed Coarseware suggests that the earlier pottery was residual in nature, the high proportion of earlier types suggests that the material constituting the deposit (presumably including the rubble) was derived, at least in part, from an early modern context. A more detailed interpretation is impossible with the information available at the time of writing.

Context 145

Context 145, a cleaning layer produced just two sherds of pottery, both of 19th century date and from one or two pie dishes.

Context 249

Context 249, a layer which sealed the top of a pit (251), produced just two sherds; the base and handle from an 18th century Slipware mug or porringer and the rim of a York A ware jar. The small size of the assemblage precluded any detailed analysis but taken at face value it would suggest an 18th century date for the sealing of the pit with the medieval sherd derived from an earlier feature in the immediate area. Considerable caution should be exercised however as the possibility of misinterpretation is high when such small quantities of pottery are involved.

Context 255

Context 255 contained just one sherd of 19th century pottery; the handle from a stoneware jug of 19th century date.

Context 288

Context 288 contained two small sherds from 19th century vessels, one from a brown-glazed jar, the other from a yellow glazed pancheon.

Context 290

Context 290, a cleaning layer, contained just one small sherd of 19th or early 20th century Bone China.

Context 291

Context 291 contained a small mixed group of sherds which included early and later medieval material alongside 19th century wares. None of the sherds weighed more than 8 grams and the later medieval sherd was particularly heavily abraded suggesting that the assemblage was derived from a variety of sources with varied taphonomic histories.

Context 343

Context 343, the primary fill of a pipe trench, contained two small sherds from 19th century pancheons. One bore brown glaze, the other clear glaze on a red body.

Context 348

Context 348 contained the largest and most distinctive assemblage from the later phases of the site. All of the pottery was of the same type, Yellow Glazed Coarseware, and the unabraded nature of the sherds and the numbers of fresh breaks suggest that a smaller number of vessels had been dumped into the feature, a stone lined culvert in a complete or semi-complete state. It is possible that the sherds had been deliberately dumped in order to facilitate drainage although to be effective the ratio of sherds to soil would have to be high and it was not possible to determine this from the

information available at the time of writing. A possible parallel may be a drainage ditch discovered on Lindley Moor in 2015 (Cumberpatch 2016) which contained a dense mass of shattered pancheons, possibly waste material from a local pottery, which had been packed into a narrow trench to form a 'French drain', an alternative to the use of porous ceramic drain pipes. There was no evidence that the sherds described here were wasters but the principle underlying the construction of a French drain is the same no matter where the material filling the trench originated.

Context 353

Context 353, a layer encountered during the excavation of a sondage, contained two joining sherds from a Brown Glazed Coarseware pancheon of 19th century date.

Context 373

Context 373, a black deposit adjacent to a culvert (368), contained just two sherds of pottery. The earliest was piece of Humberware type of 14th to early 15th century date, presumably residual as the second sherd was part of a Brown Glazed Coarseware jar of 18th to 19th century date.

Context 392

Like context 373, context 392 was also a deposit close to a culvert (372). The pottery assemblage was also similar to that from context 373 in that it consisted of residual early pottery alongside a later sherd. In this case the earliest pottery was of late medieval or early post-medieval date (two sherds of Green Glazed Sandy ware) while the later sherd was part of the base of a mid 19th century or later flowerpot. It would seem that both culverts had cut earlier features containing the medieval pottery.

Conclusion

It is difficult to draw any definite conclusions from such a small assemblage of pottery but a number of points seem to be clear:

No medieval or post-medieval deposits were encountered during the excavation. Such early pottery as was recovered was residual in later features

Context 144 contained the highest proportion of early modern pottery in relation to later wares; it is possible that the 19th and early 20th century sherds were intrusive in an earlier feature but it could also be the case that a recent feature incorporated earlier material. The latter suggestion is perhaps the more likely of the two.

Although excavations elsewhere, and notably in Sheffield, have shown that solid refuse was used as a construction material for preparing land for building, the character of such assemblages tends to be rather different from those described here in that they were much larger in size, the sherds were more heavily abraded and the assemblages were more mixed in nature (Cumberpatch 2005). With the exception of the putative French drain (context 348) it seems unlilely that the area investigated had seen large scale dumping.

Curation and archiving

The assemblage should be deposited in the appropriate local museum or finds depository where it will be available for further research in the future.

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CONSERVATION REPORT

York Archaeological Trust

Number 2019/28

Condition Assessment Report

Site Name and code: Hudson House, York

Site Director/Unit: LS Archaeology

Conservator: Sandra Toloczko

Date: 03.06.2019

Number of artefacts

Material	**Quantity**
Iron	9
Tin Waste	1

AIMS AND OBJECTIVES

This report aims to meet the requirements of MAP2 (English Heritage, 2001) and MoRPHE (English Heritage, 2006) to produce a stable site archive. This has involved X-radiography and an assessment of the condition, stability and packaging of the finds.

The condition of the various classes of material is summarised and indicators of unusual preservation noted. The potential of the assemblage for further analysis and research is discussed, and recommendations made for further investigative conservation and long term storage.

PROCEDURES

Ten metallic recorded finds (with the exception of Lead alloy) were X-rayed using standard Y.A.T. procedures and equipment. One plate was used, and each plate was given a reference number in the YAT conservation laboratory series (x9277). The X-ray number was written on each small find bag.

Each image on the radiograph was labelled with its small find number. The plates were packaged in archival paper pockets.

All finds were examined under a binocular microscope at X20 magnification. The material identifications were checked and observations made about the condition and stability of the finds, and recorded below. An assessment of each find is presented in the tables in the Appendix.

CONDITION ASSESSMENT SUMMARY

Metals:

Iron: Overall, the iron objects were in poor to fair condition. Active corrosion spots and surface cracks were noted on three finds (264 and 250), therefore dry storage is essential to avoid further outbreaks of active corrosion. Extensive cracking can be seen on (264), few fragments of the object have already chipped off. X-radiography showed the majority of the objects to have partially to almost completely mineralised cores.

Unidentified: One of the objects (250) appears to be a fragment of metalworking waste, possibly tin.

STATEMENT OF POTENTIAL

Indicators of preservation

There are no specific indicators of preservation. The corrosion products reflect well-aerated terrestrial deposits.

Evidence of technology, craft or industry or anything else of note

There is no evidence for specific technology or craft activity.

RECOMMENDATIONS

Packaging and Long Term Storage

All finds were well-packed in suitable sealed containers to provide the appropriate desiccated and damp environments.

All materials used are archive stable and acid-free. The metal finds should be stored in a desiccated environment at less than 15%RH. The desiccated environment will need to be maintained.

REFERENCES

English Heritage, Management of Archaeological Projects, 1991.

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Disclaimer

This Report has been prepared solely for the person/party which commissioned it and for the specifically titled project or named part thereof referred to in the Report. The Report should not be relied upon or used for any other project by the commissioning person/party without first obtaining independent verification as to its suitability for such other project, and obtaining the prior written approval of York Archaeological Trust for Excavation and Research Limited ("YAT"). YAT accepts no responsibility or liability for the consequences of this Report being relied upon or used for any purpose other than the purpose for which it was specifically commissioned. Nobody is entitled to rely upon this Report other than the person/party which commissioned it. YAT accepts no responsibility or liability for any use of or reliance upon this Report by anybody other than the commissioning person/party.

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Appendix: Assessment Tables

1. Iron

X-ray	Context	Assessment
9277	252	Labelled as “Metal”. Medium sized iron nail with a flat head. Voluminous orange/brown corrosion products mixed with light brown soil cover the surface of the object. Small hairline cracks are visible on the surface. Medium sized red stone is attached to the object. No signs of active corrosion. X-ray shows the object to be almost entirely mineralised towards the tip of the shaft, with a small area of metallic core surviving around the head. Condition fair. **Recommendation: no further work required.**
9277	250	Labelled as “Metal”. Two flat headed, medium sized nails. Voluminous orange/brown corrosion products mixed with light brown soil cover the surface of the objects. Small hairline cracks are visible on the surface. There are signs of active corrosion on one of the objects. Condition poor to fair. X-ray shows partially mineralised core of both objects. Tips of both nail shafts are missing. **Recommendation: no further work required.**
9277	252	Labelled as “Metal”. Two small, flat headed nails. Voluminous orange/brown corrosion products mixed with light brown soil cover the surface of the object. Small hairline cracks are visible on the surface. Small stone inclusions are visible. There are signs of active corrosion present on one of the objects. Condition poor to fair. X-ray shows the core of the smaller object to be almost completely mineralised. The larger object has a partially mineralised core and a crack which runs from the top of the head to the side of the shaft. **Recommendation: no further work required.**

X-ray	Context	Assessment
9277	250	Labelled as “Metal”. Two small hobnails and one probable nail shaft. Voluminous orange/brown corrosion products mixed with light brown soil cover the surface of the objects. There are signs of active corrosion present on the larger object. X-ray shows the objects to have partially mineralised cores. **Recommendation: no further work required.**
9277	264	Labelled as “Metal”. Long, flat headed nail. Large stone is attached to the side of the object. Dark brown corrosion products mixed with small stone inclusions are visible on the object. The surface of the object is cracked in several places. Some fragments of the object have already cracked off. There are signs of active corrosion. Condition poor. X-ray shows the object to have a metallic core, but slightly mineralised edges, especially where fragments have chipped off. **Recommendation: no further work required.**

2. Unidentified

X-ray	Context	Assessment
9277	250	Labelled as “Metal?”. Metallic fragment, grey/silver in appearance with a bubbly upper surface from high temperature, probably metalworking waste. Very light in weight, and as the object did not show up on the X-ray, nit is not lead but may be tin based. **Recommendation: no further work required.**

METAL AND NON-METAL SMALL FINDS

Nicola Rogers

30th October 2019

Introduction

Metal and non-metal finds were examined for this report; the metal assemblage was made up of 47 bags of iron finds (of which 17 were small finds), ten finds were of copper alloy (one small find), two were of lead alloy (one small find), and two comprised slag (one small find). Seven bags of iron finds from probable Roman deposits were X-rayed; none of these was a small find.

The remainder of the finds comprised objects of stone, fired clay, jet, bone and shell.

The Finds

Ironwork

A total of 28 iron nails and nail fragments were identified in 22 bags of iron finds; of these, nine appear to have come from possible Roman deposits. Five copper alloy nails, all from 19th – 20th century levels, were also recovered.

Context	Iron Nails	Copper Alloy Nails
4		3
73	1	
84	1	
136	2	
207	1	
221		1
249	1	
250	5	
252	3	
255	1	
264	1	
270	1	
348	1	
373	1	
413	4	1

Context	Iron Nails	Copper Alloy Nails
436	1	
473	2	
481	1	
T71	1	
TOTAL	**28**	**5**

Table 1 nails by context and material

Other structural fittings included seven bolts (Context 4, Context 136, Context 144), two pipe fragments (Context 4, SF13 Context 136), one nut (SF9 Context 136), one probable ring washer (Context 436), one possible strap hinge (Context 348) and one bracket (Context 4), all likely to be post-medieval/modern in date. Other iron elements which might relate to railway construction include component (SF1), and object (Context 85). Miscellaneous objects include large rectangular plates (Context 136, Context 144, Context 473), bars and rods (Context 4, Context 19, Context 489), fittings (Context 4, SF15 Context 136, T71), and possible tools (Context 4, Context 43, Context 436); none of these comes from Roman deposits.

Copper Alloy

A probable Roman hairpin shank was recovered from Context 267. Other objects appear to be of post-medieval/modern date and comprise a modern stanchion fragment (SF20, Context 136), a wire fragment (Context 213), a strip (Context T29), and a tube fragment (Context 42).

Lead Alloy

SF10 Context 136 is an undiagnostic fragment; the other lead alloy find is a strip or offcut (Context 436).

Slag

One fragment of metalworking slag (Context 252) comes from a Roman deposit; the other is SF19, from Context 136.

Bone/Antler

Both finds of bone came from Roman pit fills, but one of these (Context 250) appears to be an unworked ?fish bone. A square object with a deeply incised cross (Context 252) is made of bone or antler, and its function is uncertain, although it could be an inlay fragment.

Stone and Fired Clay

Tesserae and tesserae fragments of stone (12) and of fired clay (2) were found – of the complete tesserae, eight are 20-30mm square, and four range from 13-19mm square. Context 249 is a 19th

century deposit with other Roman material found within it, but the other three contexts from which tesserae were retrieved appear to be Roman.

Context	Stone Tesserae	Fired Clay Tesserae
249	2	
250	3	1
252	5	1
268	2	
TOTAL	**12**	**2**

Table 2 tesserae by context and material

Other stone finds include a small white rounded fragment from a Roman context (Context 252) which may or may not be natural. A 19th – 20th century slate pencil was found in Context 244, and a natural pebble was found in Context 290.

Fired clay tobacco pipes comprising bowl and stem fragments of 17th – 19th century date were found.

Context	Bowl Fragment	Stem Fragment	Date
4	1	1	Early – late 18th century
85		2	Late 18th century
144		1	17th – early 18th century
145		1	Late 18th century
205		1	Late 18th century
249	2	1	Early 17th – early/mid 19th century
290		2	Late 18th century
472		1	Late 18th century
476		1	Late 18th century
TOTAL	**3**	**11**	

Table 3 tobacco pipe fragments by context

Shell

Two finds of shell were identified: a probable button came from Context 4, and a perforated oyster shell of unknown function and date was found in Context 375.

Jet-like material

Over 50 mostly small offcuts and/or fragments of jet-like material were found (confirmation is required of the material); all came from Roman deposits, apart from the pieces in Context 249, which as noted above, is a 19th century deposit with other Roman material found within it. It seems likely that all these finds derive from the working of jet-like material within the vicinity in the Roman period.

Context	Offcuts/Fragments
249	17
250	23
252	15
267	1
268	1
TOTAL	**57**

Recommendations

Confirmation of materials is required for (a) all the jet offcuts and fragments (b) the bone or antler object (Context 252)

If possible, confirmation that the rounded stone (Context 252) is part of an object or is a natural fragment

Retention of the assemblage

The Roman material should be retained, and shown to a Roman finds specialist for further analysis.

Of the later material, most of the structural items appear to provide little useful information, and could be discarded, but the larger iron objects should be looked at alongside any other possible railway related objects, in case they also come from this industrial activity.

Any finds that are retained should be appropriately packaged and given find numbers

Conclusions

A small part of this assemblage appears to be of Roman date including evidence of the working of jet-like material, a number of red and white tesserae from floors, and also a possible hair pin fragment and a bone or antler object. There is no material which can definitively be dated to the post-Roman – medieval periods; tobacco pipes which were found range in date from the early 17th – early/mid-19th century. The vast majority of the metal objects appear to be of 19th – 20th century date, a few of which may relate to railway construction.

Responses to Recommended Actions

Material confirmation of the jet off cuts from Pit [251]

Off cuts are heavier than jet should feel however, they are chemically the same as jet. They are likely to be an impure mix of shale and jet from surface level seams. (Kate Morris, University of York PhD student).

Material confirmation of bone or antler object from (252)

Has been further assessed and result is still inconclusive.

ROMAN POTTERY

I.M. Rowlandson & H.G. Fiske

June 20th 2019

The Roman pottery from the excavation totalled five hundred and eleven sherds, weighing 5.049 kg, 4.04 RE. Much of the Roman pottery from this site showed signs of abrasion abraded with relatively few fresh sherds. The majority of the Roman sherds were found stratified with post-Roman finds and could best be considered as 'background noise' from occasional dumping of waste in the area. The majority of the pottery could be dated to the 3rd to 4th century AD with smaller quantities of pottery from the 2nd and possibly the 1st century AD present. Highlights amongst the assemblage were imported colour-coated beakers from Central Gaul and the Mosel region of modern Germany, and mortaria from Soller of types similar to those recorded from other waterfront assemblages. Most significant was a sherd from a flanged bowl in a *Céramique à l'éponge* marbled ware fabric dating to the 4th century AD which was a very rare find from a site in York or the north of England as a whole as few vessels of this type reached so far north.

The material has been fully recorded and paralleled, no further work is required on this material and the text of this contribution could be used to accompany any subsequent report.

Methodology

The pottery from the site was split by Chris Cumberpatch and the Roman material was recorded and presented here. The pottery has been archived using count and weight as measures according to the guidelines laid down for the minimum archive by The Study Group for Roman Pottery (Darling 2004) using the codes fabric and form codes in use for York prefixed with a 'Y' (Monaghan 1997) and the database structure and other codes developed by the City of Lincoln Archaeological Unit- CLAU (see Darling and Precious 2014). An attempt at a 'maximum' vessel estimate has been made following Pollard (1990). The archive record (below) is an integral part of this report and will be curated in an Access database available from the author in a digital format. Thanks go to Hugh Fiske for producing the tabulated data and to LS Archaeology for site information. Also thanks go to Chris Cumberpatch for his further thoughts on the handmade pottery from the site (this volume) and to Dr. Monteil for her samian ware contribution .

Dating

The detailed archive is presented at the end of this report. The table below provides a quantified spot dating summary by context. The majority of the Roman pottery was found stratified with post-Roman finds. The table below presents the date of the Roman pottery only: the full text of the report and the other specialist reports should be consulted to ascertain the date attributed to each deposit.

The range of material present included pottery from the 2nd to the 4th century AD with a few sherds possibly dating to the later 1st century AD. The majority of the groups of Roman pottery contained material dating to the late Roman period with a proportion of residual material dating to the 2nd to earlier 3rd century AD.

A small number of features have been highlighted by the excavators and considered likely to be deposits of Roman date including the fills of pit 251 (Fills 250 and 252). The large mixed group of Roman pottery from this feature included paint decorated Crambeck Red ware and Huntcliff jars that would suggest a date in the late 4th to early 5th century AD. A Huntcliff jar also dated the group of Roman pottery from deposit 268 to a similar date at the very end of the Roman period. Fill 258 of feature 259 could be dated to the 3rd to 4th century AD on the basis of sherds from a Soller type mortarium and grey ware.

Overview of fabrics and forms

The fabrics and forms from the site as a whole are shown in the tables below.

HHY18 Fabric Summary							
Fabric code	Fabric group	Fabric details	Sherd	Sherd %	Weight (g)	Weight %	Total RE %
AMPH	Amphora	Miscellaneous amphorae	1	0.20%	9	0.18%	0
AMPH ?	Amphora	Miscellaneous amphorae	1	0.20%	14	0.28%	0
DR20	Amphora	Dr 20 amphorae	6	1.17%	374	7.41%	0
GAU	Amphora	Undifferentiated Gaulish amphorae	5	0.98%	51	1.01%	0
GAU4	Amphora	Gauloise 4	1	0.20%	224	4.44%	0
SPAA	Amphora	Baetican- Misc Southern Spanish	1	0.20%	13	0.26%	0
YM1	Mortarium	Crambeck Early coarse fabric	6	1.17%	235	4.65%	13
YM22	Mortarium	South Carlton off-white fabric	1	0.20%	41	0.81%	0
YM33	Mortarium	Verecundus and similar from Soller	3	0.59%	235	4.65%	7
YC0	Fine	Unknown colour coated ware	2	0.39%	2	0.04%	0
YC1	Fine	Lower Nene Valley colour coat, cream	48	9.39%	129	2.55%	23
YC1?	Fine	Lower Nene Valley colour coat, cream	1	0.20%	7	0.14%	4
YC2	Fine	Lower Nene Valley colour coat, grey	1	0.20%	2	0.04%	0
YC23	Fine	Central Gaulish Black Ware	5	0.98%	7	0.14%	7
YC24	Fine	*Moselkeramik*	4	0.78%	6	0.12%	2
YC3	Fine	Lower Nene Valley colour	1	0.20%	6	0.12%	0

HHY18 Fabric Summary							
		coat, orange					
YC31	Fine	*Céramique à l'éponge* Marbled ware	1	0.20%	9	0.18%	0
YC4	Fine	Lower Nene Valley or Rhineland colour coat	1	0.20%	1	0.02%	0
YC9	Fine	Swanpool colour-coat and similar fabrics	1	0.20%	17	0.34%	0
YE0?	Oxidised	Possible Ebor	3	0.59%	26	0.51%	0
YE1	Oxidised	Eboracum 1	17	3.33%	177	3.51%	4
YE2	Oxidised	Eboracum2 coarse oxidised	5	0.98%	29	0.57%	4
YE3	Oxidised	Eboracum 3	3	0.59%	12	0.24%	0
YE6	Oxidised	Eboracum 'Red painted' ware	1	0.20%	12	0.24%	2
YO0	Oxidised	Unidentified oxidised fabrics	28	5.48%	216	4.28%	2
YO1	Oxidised	Non-Ebor 'legionary' type	1	0.20%	14	0.28%	0
YO2	Oxidised	Crambeck late red ware	2	0.39%	32	0.63%	13
YP0	Oxidised	Unidentified white ware	3	0.59%	9	0.18%	7
YP2	Oxidised	Crambeck late parchment ware	1	0.20%	3	0.06%	0
YW0	Oxidised	Misc. White slipped	4	0.78%	27	0.53%	0
YW1	Oxidised	Ebor 1 white slipped	14	2.74%	43	0.85%	0
YB0	Reduced	Unknown burnished ware	82	16.05 %	579	11.47%	21
YB1	Reduced	Black-burnished ware 1	17	3.33%	122	2.42%	16
YB12	Reduced	Crambeck grey ware	66	12.92 %	632	12.52%	70
YB17	Reduced	Grey burnished local/East Yorkshire	5	0.98%	116	2.30%	27
YB3	Reduced	Local grey-burnished ware	39	7.63%	332	6.58%	21
YB8	Reduced	Misc. native burnished fabrics	5	0.98%	38	0.75%	14
YG0	Reduced	Misc. grey fabrics	23	4.50%	66	1.31%	11
YG0?	Reduced	Misc. grey fabrics	1	0.20%	8	0.16%	0
YG1	Reduced	Local grey ware	35	6.85%	348	6.89%	91
YG18	Reduced	Late handmade ware, plain	2	0.39%	12	0.24%	0
YR2	Reduced	Rustic: Local rustic ware	1	0.20%	14	0.28%	0
YH0	Calcareous	Misc. Shell-gritted	9	1.76%	87	1.72%	0
YH1	Calcareous	Shell-gritted Dales ware	3	0.59%	60	1.19%	13
YH2	Calcareous	Sparse shell and some sand	1	0.20%	6	0.12%	4
YK0	Calcareous	Misc. calcite-gritted handmade fabric	2	0.39%	9	0.18%	0
YK1	Calcareous	Calcite gritted 'Huntcliff' ware	45	8.81%	603	11.94%	28

HHY18 Fabric Summary							
STIL	Stone tile	Paver/roofer	0	0.00%	0	0.00%	0
YN1	Handmade	Native tradition- sand plus irregular inclusions	2	0.39%	31	0.61%	0
YN3	Handmade	Native tradition- grog-tempered	1	0.20%	4	0.08%	0

HHY18 Forms Summary							
Form	Form Type	Form Description	Sherd	Sherd %	Weight (g)	Weight %	Total RE %
YA	Amphora	Unclassified form	15	2.94%	685	13.57%	0
YK	Beaker	Unclassified form	28	5.48%	41	0.81%	4
YKB	Beaker	Bag-shaped	1	0.20%	9	0.18%	11
YKF	Beaker	Funnel-necked & indented	3	0.59%	4	0.08%	9
YKF1	Beaker	Funnel-necked & indented with plain rim and applied decoration	3	0.59%	12	0.24%	0
YB	Bowl	Unclassified form	13	2.54%	106	2.10%	9
YBA	Bowl	'African' bowl	1	0.20%	23	0.46%	0
YBF	Bowl	Flanged	2	0.39%	21	0.42%	2
YBF2	Bowl	With high curved flange	2	0.39%	21	0.42%	2
YBH1	Bowl	Hemispherical with a bead rim and one or two medial grooves	1	0.20%	13	0.26%	4
YBT	Bowl	Throlam type	1	0.20%	10	0.20%	4
YBT2	Bowl	Throlam type with hooked rim	1	0.20%	98	1.94%	17
YBW1	Bowl	Wall sided with painted collar, Crambeck 7	1	0.20%	26	0.51%	9
CLSD	Closed	Form	25	4.89%	348	6.89%	0
YD	Dish	Unclassified form	5	0.98%	75	1.49%	0
YDD	Dish	'Dog dish'	3	0.59%	18	0.36%	14
YDF3	Dish	Flanged dish with developed flange	11	2.15%	236	4.67%	67
YDF6	Dish	With developed, thick flange	1	0.20%	17	0.34%	4
YDG	Dish	'Dog dish' with external groove	2	0.39%	22	0.44%	6
YDP	Dish	'Pie dish' with rolled rim,	1	0.20%	53	1.05%	9

HHY18 Forms Summary							
5		undecorated					
YJ	Jar	Unclassified form	13	2.54%	164	3.25%	22
YJC 4	Jar	Cavetto rim	1	0.20%	16	0.32%	7
YJD 1	Jar	True Dales-type jar	1	0.20%	3	0.06%	2
YJD 2	Jar	Wheelmade Dales-type jar	1	0.20%	6	0.12%	4
YJE	Jar	Everted rim	10	1.96%	97	1.92%	89
YJE 1	Jar	Plain everted rim	1	0.20%	13	0.26%	14
YJH	Jar	Huntcliff and proto-Huntcliff	5	0.98%	134	2.65%	26
YJN	Jar	Narrow mouthed	1	0.20%	11	0.22%	17
YJR	Jar	Rusticated	4	0.78%	31	0.61%	0
YJT	Jar	Handled jar	1	0.20%	53	1.05%	0
YL	Lid	Unclassified type	1	0.20%	10	0.20%	4
YLA	Lid	Plain rimmed	1	0.20%	23	0.46%	15
YLE	Lid	With bead or thickening below rim	1	0.20%	15	0.30%	9
YT	Misc	Tazza	1	0.20%	39	0.77%	0
YM	Mortarium	Unclassified form	1	0.20%	127	2.52%	0
YM B	Mortarium	With short, thick or beaded flange, including Oxford M22	1	0.20%	28	0.55%	2
YM C	Mortarium	Collared, as Crambeck 7	1	0.20%	66	1.31%	7
YM E	Mortarium	With everted or hooked flange	1	0.20%	41	0.81%	0
YM P	Mortarium	With prominent rim proud of everted flange, as Crambeck 6	1	0.20%	41	0.81%	7
YM R2	Mortarium	Reeded variation with prominent upper reed	1	0.20%	55	1.09%	4
-	Unknown	Form uncertain	343	67.12 %	2238	44.33%	4

Samian

As would be expected for a group of Roman pottery from York a small quantity of samian was present. This has been recorded and discussed in detail by Monteil (this volume).

Amphora

Southern Spanish globular Dressel 20 (DR20) and other Spanish amphora (SPAA) were the most common types present. Early gritty type fabrics (Tomber and Dore 1998, BAT AM1) and later 'salt-surfaced' variants (BAT AM 2) were both present. Gaulish flat bottomed type amphorae were retrieved but mostly as small fragments (GAU, GAU4). Most of the sherds were in the typical GAL AM1 fabric variant with a single vessel from context 252, a body sherd with a handle scar with a red fabric and white surfaces, broadly similar to the GAL AM2 fabric or perhaps more akin to the fabric of a vessel from Moss Street, York described by Vince and possibly from northern France (in Toop 2003, YATAA). Two further possible of amphora were also present (contexts 252 and 489). The range of amphora present is fairly typical of what might be expected of a site from York (Monaghan 1997). Amphorae occur far more commonly on fort or urban sites than on rural sites as such goods were in greater demand and were probably redistributed from such centres. As all of the amphora were found stratified in Late Roman or post-Roman contexts they tell us little of the diet of the Roman occupants of the Hudson House site itself as they were commonly re-used after their initial contents were drained, often for structural or aggregate purposes (see Peňa 2007). Examples of this are known from York including the selection of amphora for the construction of floor deposits at Wellington Row (Monaghan 1997, 1114, deposit P4/9).

Mortaria

Mortaria sherds were mostly retrieved from context 250 with a few also from contexts 252 and 258. The majority of the vessels present were attributed to the Crambeck production source (YM1) including three rim sherds: a bead and flanged type (YMB), a reeded type (YMR2) and a flanged vessel similar to Crambeck form 6 (YMP). The presence of such types would fit with the Late Roman date of the majority of the pottery when Crambeck types were the most common type in use in York. Other vessels present included a second century mortarium from Lincoln with a hooked rim (YME, context 250) dating to the 2nd century AD and sherds from Soller, Germany including a collared rim type mortarium (Richardson 1986 Ill. 1.83) and other body sherds likely to date to the 3rd century AD. Mortaria from Lincolnshire were fairly common finds on a number of sites dating to the 2nd century AD and Soller products were present in significant quantities in Phase 4 deposits at Wellington Row (Monaghan 1997, 941).

Other fine wares

Other fine wares present included sherds from beakers in imported Central Gaulish Black ware from modern day France (YC23) and *Moselkeramik* from Germany (YC24). Excavations at Wellinghton Row found significant quantities of these wares in P4 deposits dating to the 3rd century AD (Monaghan 1997, 114). A flange sherd from a *Céramique à l'éponge* Marbled ware hemispherical flanged bowl (Tyers 1996 Fig. 160) was also present. This vessel was a rare import of a type not commonly seen in the north of England.

The most common fine ware present were Nene Valley type colour-coated wares with a white fabric where small sherds from up to 49 vessels were recorded. As would be expected for a site with significant quantities of pottery of 3rd century AD date nearly all of the sherds were from beakers with an example of a straight sided bead and flanged bowl (YDF3, context 250) and a dish with a grooved rim (YDG, context 268) the only other vessels recorded. Smaller quantities of sherds from beakers in the fabric variants YC2, YC3 and YC4 were also noted. The pattern here would fit with other urban dumped deposits from the area which would suggest the inhabitants regularly used imported table ware. As would befit an assemblage with significant quantities of pottery dating to the 3rd century AD most of these vessels were from colour-coated beakers.

Oxidised wares

As would be expected from a site in the vicinity of York a proportion of the pottery was of Ebor ware type produced by the local potters serving the legion. The range of forms in the Ebor 1 fabric that were evident included a tazza (YT), a hemispherical bowl mimicking samian form 37 (YBH1) and an African type bowl (YBA) carinated bowls and jars with everted rims. A hemispherical flanged bowl and a rusticated jar, possibly dating to the 1st century AD, were recorded in the coarser YE2 fabric and three sherds of the Ebor 3 fabric were also notes. One vessel of note was a sherd from a hemispherical flanged bowl in the paint decorated Ebor 6 fabric (YE6, YBF2) recorded from context 375.

Other oxidised wares presented for study included 28 sherds in the miscellaneous oxidised YO0 group many that were not certainly of Roman date. A sherd from a Crambeck Late Red ware wall sided bowl with painted collar (as Crambeck type 7) was the only other oxidised vessel of note.

White slipped sherds in the YW0 and Ebor YW1 fabric groups, probably dating to the 2nd century AD, were also present in small quantities. A sherd of Crambeck patchment ware and three other white ware sherds were also noted.

Reduced wares

Burnished wares present included a small range of Black Burnished ware 1 and similar Black Burnished ware 1 type copies including a fragment from a jar with a cavetto rim (YJC4), a plain rimmed dish (YDD) and a straight sided bead and flanged bowl (YDF6) all forms likely to date to the late 3rd to 4th century AD. Further examples of jars with everted rims, a dish with a plain rim, a handled jar (YJT) and a lid (YLE) were recorded in a local burnished fabric. Crambeck grey wares were well represented with single examples of a dish with a grooved rim, a 'Throlam type' bowl and sherds from two jars. The majority of the recognisable forms in this fabric were straight sided bead and flanged bowl YDF3 a ubiquitous type in late Roman assemblages in the north. A small quantity of grey ware in a Throlam type fabric (YB17, see discussion of fabric source in Monaghan 1997) were recorded including the large wide-mouthed bowl YBT2 and a jar with an everted rim (YJE).

Other grey wares, mostly likely to be local products (YG1), included sherds from jars with everted rims, a lid, a narrow mouthed jar and a straight sided bead and flanged bowl (YDF3). These sherds may have ranged in date from the 2nd to 4th century AD.

A single coarsely 'web' rusticated sherd (YR2) was recorded from context 472 of a type considered to date to the Early Roman period at York (Monaghan 1997).

Calcite-gritted and Shell-gritted wares

Calcite-gritted wares present were present in a number of groups with Huncliff jar rims (YK1, YJH) from contexts 249, 250, 252 and 268. These sherds dated to the later 4th to early 5th century AD and are a key indicator of pottery produced at the end of the Roman period at sites in the Vale of Pickering. Shell-gritted wares present included fragments from at least three Dales ware jars dating to the 3rd to earlier 4th century AD and a bowl. These vessels were probably produced in northern Lincolnshire or perhaps near the north bank of the River Humber and examples of this fabric are commonly found on sites at York.

Handmade 'native' type wares

A small number of sherds (recorded as YB8, YG18, YN1 and YN3 in this archive) were presented to Cumberpatch to clarify their dating. Cumberpatch concluded that these small sherds with few diagnostic features could be dated some time from the pre-Roman Iron Age to Saxon period and has provided more detailed description (this volume).

Other material

A single fragment from a stone tile was present amongst the pottery from context 250 this fragment is similar to the material described by (McCormish, this volume).

Conclusions

The majority of the material was abraded and it suggests that it was not from 'primary' contexts much of the material may have been re-deposited during the Roman period, perhaps as a result of redistribution of waste. The level of disturbance caused by the construction and destruction of modern buildings has most probably further mixed the material retrieved from these investigations when clearly many Roman deposits were disturbed in the 19th and 20th century in this part of York (eg. RCHMY, p76-92).

The practice of reuse and dispersal of urban domestic waste, earth from excavations and their associated finds has been discussed by a number of authors with examples of the practice were evident in Roman and post-Roman cities (Young et al. 2005, Bryant 2011, Dicus 2014). Many of the assemblages from this part of York including Wellington Row and 5 Rougier Street (Monaghan 1997, 1106-8; Perrin 1990) unsurprisingly have high levels of residual Roman pottery in later Roman phases and a considerable proportion of Roman pottery from within post-Roman deposits. The range of material present is similar to that already published from this part of York and it would appear that there were no significant stratified groups that offered further research potential. The *Céramique à l'éponge* marbled ware vessel was the only unusual find amongst the assemblage.

Recommendations

The pottery should be retained and deposited in the relevant local museum. A note on the Roman pottery referencing this assessment report would be appropriate as part of any publication of this site. The sherd of *Céramique à l'éponge* marbled ware may be of further interest to researchers looking at the distribution of continental fine wares in Britain.

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HHY18 Dating Summary							
Context	Spot date	Post-Roman date	Other Dating	Comments	Sherd	Weight (g)	Total RE %
042	L1-E3	-	Roman: Stone peg?; 14-16C? CBM: Brick	A single sherd of Ebor ware probably from a large bowl.	1	23	0
144	3-4C	C19th	Modern CBM: Box Flue, Brick, Plain	A small group including a sherd from a large handled grey ware jar.	6	68	0
244	Roman	-	Modern CBM: Brick	A small group including Ebor ware and an everted rim from a grey ware jar.	2	31	19
249	L4-E5	C18th	Roman: Stone Peg; Roman & Intrusive CBM: Box flue, Brick, Post-medieval brick?, Roman brick,	A medium sized group including calcite-gritted Huntcliff jars, Crambeck grey ware, grey ware and colour-coated sherds.	34	310	14
250	L4-E5	-	Roman Stone floor? Stone Peg? Stone Tessera; Roman CBM: Box flue, Imbrex, Brick, Tegula, Tessera	A large mixed group of mostly late Roman pottery including sherds from Dressel 20 amphora and Crambeck mortaria, colour-coated beakers, a colour-coated bead and flange bowl, a Crambeck red ware paint-decorated bowl, a sherd of Derbyshire ware, calcite-gritted Huntcliff jars, grey ware and Crambeck grey ware including a straight sided bead and flange bowl. An unusual mortarium with a grooved bead was from Soller	247	2507	178

HHY18 Dating Summary							
				(Richardson 1986 Ill. 1.83).			
252	L4-E5	-	Roman Stone floor? Stone Peg?; Roman & Intrusive CBM: Imbrex, Post-medieval brick, Roman brick, Tegula, Tessera	A medium sized group including sherds from Dressel 20 type amphorae, a mortarium with a reeded rim, grey ware, Crambeck grey ware, calcite-gritted ware, Black Burnished ware 1 and sherds from colour-coated beakers. The excavators have considered this group to be of Roman date.	105	977	54
258	3-4C	-	Modern Slate, Stone Peg; Roman CBM: Imbrex, Roman brick	A small group including grey ware and a body sherd from a large Soller type mortarium. The excavators have considered this group to be of Roman date.	5	151	0
267	4C	-	Roman Stone Peg; Roman CBM: Box flue, Roman brick	A medium sized group including colour-coated sherds, grey ware and Crambeck grey ware. A sherd from a Black Burnished ware 1 straight sided bead and flange bowl was also present. A flange sherd from a Céramique à l'éponge Marbled ware hemispherical flanged bowl (Tyers 1996 Fig. 160) was also present. The excavators have considered this group to be of Roman date.	32	295	18
268	L4-E5	-	Roman Stone Peg; Roman CBM: Imbrex, Roman brick,	A small abraded group including colour-coated ware, grey ware, a rim from a Black Burnished	33	181	22

HHY18 Dating Summary							
			Tegula?	ware 1 jar with a cavetto rim and a Huntcliff jar. The excavators have considered this group to be of Roman date.			
270	Roman	-		A small group of grey ware.	2	7	0
286	L3-4	-	Roman CBM: Box flue, Roman brick	A sherd from a large grey ware jar or bowl and a sherd in a mica-rich fabric.	2	113	17
373	3-4C	c18th-19th		A small group including a sherd from a Dressel 20 amphora, a colour-coated beaker, an Ebor ware bowl and grey ware.	6	57	14
375	3C+	-	Modern Slate; 14-16C CBM: Plain glazed floor, Plain, Roman brick	A medium sized group including sherds from an Ebor ware tazza, a painted Ebor ware bowl, Black Burnished ware 1, grey ware, rusticated ware and a single calcite-gritted sherd.	31	284	50
392	M3+	MC19th-20th	Roman Stone Peg; 16-18C CBM: Box flue, Imbrex, Medieval brick, Post-medieval brick, Plain, Roman brick, Tegula	A small group including a sherd from a colour-coated beaker with a funnel neck and a rim sherd from a white ware bowl or dish.	2	13	18
472	AD70-150	-		A small group including a sherd of Ebor ware and rusticated ware.	2	18	0
489	Roman	-		A possible amphora sherd.	1	14	0

SAMIAN WARE

G. Monteil

10/07/2019

Introduction and methodology

A small assemblage of samian ware was submitted for this report. The fabric of each sherd was examined, after taking a small fresh break, under a x 20 binocular microscope and was catalogued by context number. Each archive catalogue entry consists of a context number alongside fabric, form and decoration identification, sherd count, rim or base EVE (Estimated Vessel Equivalent) when appropriate and weight. A catalogue of the decorated ware (Cat. nos. 1 and 2) is provided at the end of this report. Rubbings of the decorated fragments were made, mounted, scanned and submitted as illustrations.

The following report was written without detailed information about the site and will need updating once the full stratigraphical narrative is available.

Results

The assemblage is small with 26 sherds making up 24 vessels adding up to just above 115g and a rim EVE figure of 0.33 (table 1). The group is largely made up of small and abraded fragments with a particularly low average weight of just under 6g which suggests that this material is residual and re-deposited.

	South Gaulish				Central Gaulish				East Gaulish				Total			
context	sh	wgt	RE	MNV	sh	wgt	RE	MNV	sh	wgt	RE	MNV	sh	wgt	RE	MNV
249	1	0.5		1	1	0.5		1					2	1		2
250	1	2		1	8	20		7	2	14.5	0.06	2	11	36.5	0.06	10
252	1	2	0.05	1	2	30		1	5	19		5	8	51	0.05	7
267					1	2		1	1	2		1	2	4		2
268					1	1		1					1	1		1
290									1	7	0.05	1	1	7	0.05	1
375					1	15	0.17	1					1	15	0.17	1
Total	**3**	**4.5**	**0.05**	**3**	**14**	**68.5**	**0.17**	**12**	**9**	**42.5**	**0.11**	**9**	**26**	**115.5**	**0.33**	**24**

Table 1: samian fabrics recovered in each context (sh=sherd count, wgt=weight in g, RE=rim EVE, MNV=Maximum Number of Vessels)

Three contexts yielded South Gaulish samian (249, 250 and 252), three small and abraded fragments barely adding up to 5g. Only one sherd can be attributed to form, the rim of a cup Dr.33a from context (252).

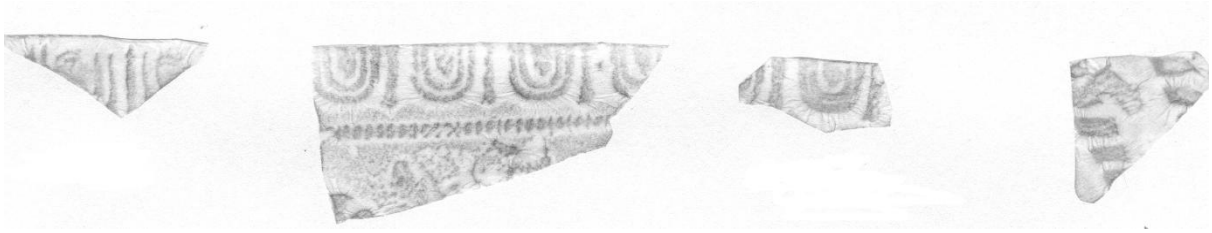
With 14 fragments Central Gaulish material dominates this small assemblage although half of them are very small and undiagnostic flakes. All are from Lezoux. Two Hadrianic pieces are present, both from context (250), a Dr.27 with a patch of internal wear and a dish form Dr.18/31R. Amongst the rest only three sherds can be attributed to form: a Dr.31R from (268) which is a form normally dated AD160-200, a Dr.33 from (375) that is probably Antonine and a decorated bowl form Dr.37 from (252) which is Antonine (Cat. No.2).

East Gaulish material is relatively well-represented in this group adding up to nine sherds (table 1). The East Gaulish samian group mostly originates from the later industries of Rheinzabern and Trier with two pieces from the Argonne region. The types are late with a decorated bowl from Rheinzabern dating to the 3rd c. AD (context 252, Cat. no.3), another one from Trier that is less diagnostic but likely to be 3rd c. AD too (Cat. No.1) and a limited range of plain forms more typical of the later 2nd c. AD and first half of the 3rd c. AD (Bird 1993): three beakers including one with barbotine decoration with a Rheinzabern fabric, a mortarium from Trier and a flanged bowl form Dr.38 with a plain rim from Rheinzabern.

Concluding remarks

The samian group is too small to attempt much in terms of statistical analysis and since it was recovered residual in late Roman and post-Roman contexts (Rowlandson, this volume) its intrinsic value is limited. The fabrics and forms present broadly fit with other samian assemblages recovered from sites in the area of the colonia in York (Hartley and Dickinson 1990; Monaghan 1997, 946-7).

Decorated samian catalogue



Decorated samian: Catalogue numbers 1-4 (left to right)

The following catalogue lists and identifies the decorated pieces recovered from the site that could be attributed to individual potters or groups of potters.

The letter and number codes used for the non-figured types on the Central Gaulish material –such as B223, C281, etc are the ones created by Rogers (1974). The figured-types referred to as Os. *** are the ones illustrated by Felix Oswald in his *Index of figure-types on terra sigillata* (1936).

The Inventory Numbers (Inv. No.) quoted are taken from *European intake of Roman Samian ceramics.* http://www.rgzm.de/samian

Cat.no.1 – (250) – one rim sherd, Dr.37, Trier. Too little of the ovolo remains for it to be assigned to a potter or group of potters, the fabric suggests this is a late piece. Probably late 2nd to mid-3rd c. AD

Cat.no.2 – (252) – two non-joining body sherd, Dr.37, Lezoux. Ovolo B143, beaded border and very partial leaf which all point to potter Cinnamus ii (Inv. No. 0011119). AD140-180

Cat.no.3 – (252) – one body sherd, Dr.37, Rheinzabern. Three partial examples of roped border O231 (Ricken and Fischer 1963) are all that remain, this decoration is known for three different styles all related to Victor v (Ricken 1948, Taf.232-5 and Hartley, Dickinson 2012, 236). AD220-260

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SLAG

9th May 2019

Introduction

This assessment report describes the material classified as slag recovered from the excavations at Hudson House, York A brief overview of the material from the site is provided, followed by a detailed description and quantification. The significance of the material is discussed and recommendations made for further work. The assessment report follows the guidelines issued by English Heritage (Dungworth 2015, 13-14).

Slag Classification

The slags were visually examined and the classification is based solely on morphology. The debris associated with metalworking, or submitted in the understanding that they are associated with metalworking, can be divided into two broad groups; residues diagnostic of a particular metallurgical process or non-diagnostic residues that may have derived from any pyrotechnological process (McDonnell 2001). The diagnostic ferrous debris can be attributed to a particular ironworking process; these comprise ores and the ironworking slags, i.e. the macro, hand recovered smelting and smithing slags and the micro-residues such as hammerscale and slag fragments recovered from sieving programmes. The second group, are the diagnostic non-ferrous metalworking debris, e.g. crucibles and moulds. Thirdly, there are the non-diagnostic slags, which could have been generated by a number of different processes but show no diagnostic characteristic that can identify the process. In many cases the non-diagnostic residues, e.g. hearth or furnace lining, may be ascribed to a particular process through archaeological association. The residue classifications used in the report are defined below.

Diagnostic Ferrous Slags and Residues

Smithing Slag - randomly shaped pieces of iron silicate slag generated by the smithing process. In general slag is described as smithing slag unless there is good evidence to indicate that it derived from the smelting process.

Hearth Bottom (HB) - a plano-convex accumulation of iron silicate slag formed in the smithing hearth. The dimensions of the hearth bottom are tabulated.

Flowed Slag (Tap) – iron slag that is characterised by its ropey flowed morphology, indicating a free-flowing slag. The slag is normally black in colour. The upper surface is smooth, sometimes with

ripples. Large gas bubbles may be present. It is normally thought to be a classic iron smelting slag, but in the case of Hudson House and the period it probably derived from another process.

Hammerscale - there are two forms of hammerscale, flake and spheroidal generated during the smithing process. The presence of hammerscale is therefore a strong indicator that smithing (primary or secondary) was carried out on the site. Their small size precludes their hand recovery, and they are usually recovered during soil sample sieving (for environmental data).

Diagnostic Non-Ferrous Slags and Residues

Green Stained Slag – evidence of non-ferrous metalworking

Non-Diagnostic Slags and Residues

Hearth or Furnace Lining - the clay lining of an industrial hearth, furnace or kiln that has a vitrified or slag-attacked face. It is not possible to distinguish between furnace and hearth lining.

Slagged Lining – heavily slag attacked furnace lining.

Fired Clay – normally red in colour the fired clay lacks vitrified surfaces, indicating a lower firing temperature. It may derive from a hearth or furnace structure but may also be domestic in origin, e.g. daub.

Clinker - high silica content smithing slag probably generated in a post-medieval coal fired hearths, including e.g. a fire-box.

Other – material that is not slag etc, e.g. stone.

Results

Overview

The assemblage from Hudson House is small (Total Weight 2.4kg) and contained eight different residue types indicative of a range of technological processes.

Description

Table 1 lists the slag types, count and weight present on the site. The assemblage is dominated by smithing debris comprising 14 fragments of smithing slag (total weight 0.6kg) and a single partially formed hearth bottom (Context 4 (an unstratified cleaning layer); weight 0.371 kg; Major Diameter 88mm; Minor Diameter 86mm; Depth 37mm). These form 40% by weight of the total assemblage. In addition, there are 136 fragments of clinker (total weight 0.893kg, 38% by weight of the total); which probably derived from coal fired hearths or furnaces, including coal or coke fired smithing hearths. There are 11 pieces (total weight 0.2kg, 9% of the total weight) of flowed slag displaying classic smelting tap slag features, e.g. fine-grained fracture and a smooth upper surface.

There are six fragments of hearth lining and slagged lining (total weight 0.217kg) and four fragments of fired clay (total weight 0.058kg), which is non-diagnostic and may not derived from industrial processes.

There was a small quantity copper stained slag-like material. Two samples were analysed by Hand-Held X-Ray Fluorescence (HH-XRF, the methodology is provided in Appendix 1)); the sample from Context 4 (Figure 1) only contained lead; the small fragment from Context 286 (Figure 2) contained copper, lead and a trace of tin.

One small stone fragment was classified under the Other heading.

Discussion

There is evidence for blacksmithing, but the quantity is very small and the hearth bottom and 8 pieces of smithing slag (total weight 0.188kg) were recovered from Context 4 a site-wide cleaning layer and therefore probably unstratified. The remaining slag was recovered from Context 250 (the fill of pit 251, 3 pieces, total weight 0.236 kg) which also contained slagged lining, fired clay and cinder (0.462 kg). This may be a dump f smithing material to help backfill the pit. The three other pieces were recovered from Contexts 205, 207 and 268). The cinder was recovered from seven contexts and two test pits/trenches (T3 and T29). The largest number of fragments and weight was recovered from Context 250 (0.462 kg). Context 249 contained 50 fragments (total weight 0.103 kg) and a fragment of the flowed slag and a piece of hearth lining.

The eleven fragments of flowed slag were recovered from five contexts, the largest quantity from Context 267 (a deposit, 7 fragments, 0.114 kg). Two fragments were analysed by HH-XRF (the methodology is provided in Appendix 2), to assess the presence of manganese in the sample, which if present at elevated levels is a strong indicator that the slags derive from iron smelting rather than other processes. The HH-XRF spectrum from a sample from Context 267 (Figure 3) shows no significant manganese peak. This is confirmed in the semi-quantitative data derived from the spectra (Table 2). These data show the slags are typical of iron working slags in general; they are dominated by iron oxide and silica, the other oxides are present in low concentrations, although the phosphorus (P_2O_5) level is significant. It is probable that these flowed slag fragments derived from post-medieval iron working, possibly a foundry.

The slags and residues are scattered across the site with no clear concentrations, possibly with the exception of Pit 251 which contained contexts 249, 250 and 252 and contained examples of smithing slag, flowed slag, hearth lining, slagged lining, fired clay and cinder (total weight of cinder in Pit 251 was 0.6 kg). The slags derived from blacksmithing suggest a change in fuel source; the hearth bottom and smithing slags are typical of slags formed in a charcoal fuelled hearth, whereas the cinder derives from a coal or coke fired hearth.

The assemblage can be considered as a background scatter of industrial debris typical of urban contexts.

Recommendations

No further work is required on the assemblage. For archiving purposes, the assemblage could be reduced by reducing the size of the larger deposits of cinder (Context 249 and 250 and T29).

References

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Context	HB Weight	Smith Slag Count	Smith Weight	Flowed Slag Count	Flowed Slag Weight	HL Count	HL Weight	Slagged Lining Count	Slagged Lining Weight	Fired Clay Count	Fired Clay Weight	Cinder Count	Cinder Weight	Cu Stained Slag Count	Cu Stained Slag Weight	Other Weight
4	371	8	188					1	28			3	48	10	25	
144				1	11											
205		1	130													
207		1	5													
226												1	3			
249				1	22	1	5					50	103			
250		3	236					2	139	1	11	50	462			
252												18	35			27
267				7	114			1	28	2	21	3	7			
268		1	8			1	17					1	1			
286														1	1	
343				1	20											
413										1	26					
433				1	34											
T29												8	202			
T3												2	32			
Total	371	14	567	11	201	2	22	4	195	4	58	136	893	11	26	27
%	16		24		9		1		8		2		38		1	1

Table 1 Catalogue of the Hobson House residues, listed by context number, weight in grams.

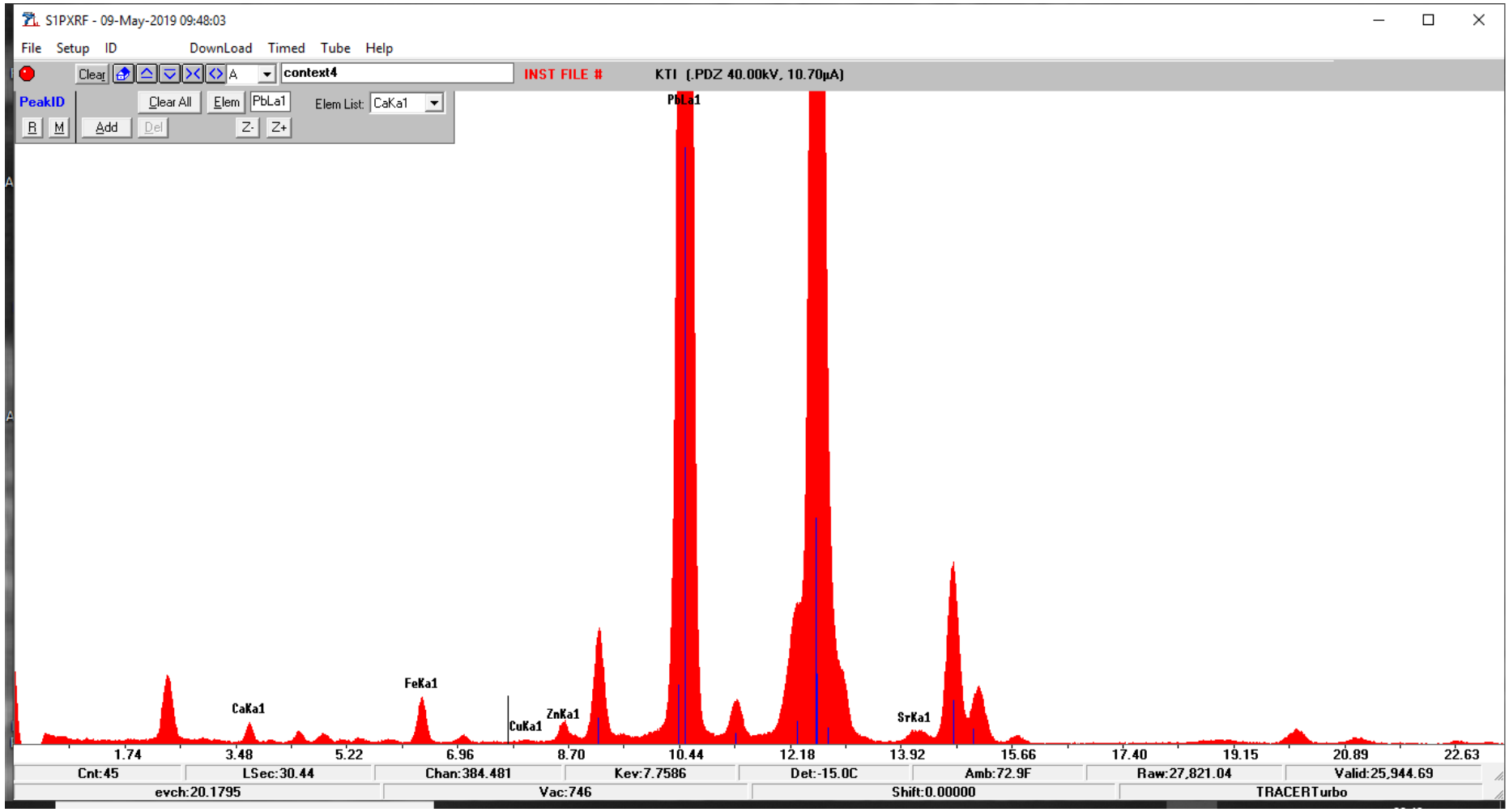

Figure 1 HH-XRF spectrum of the green stained slag from Context 4.

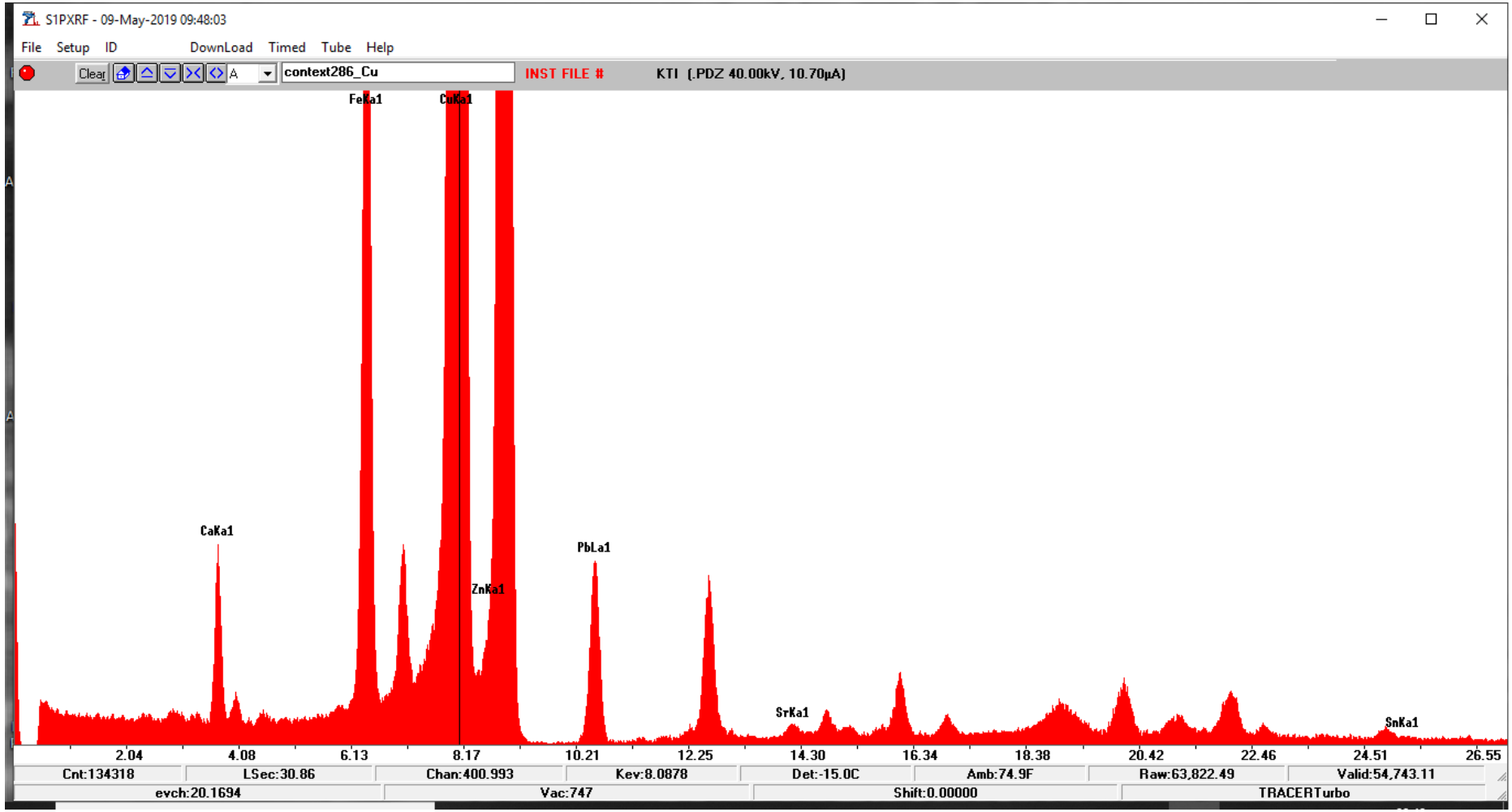

Figure 2 HH-XRF spectrum from the green stained slag from Context 286.

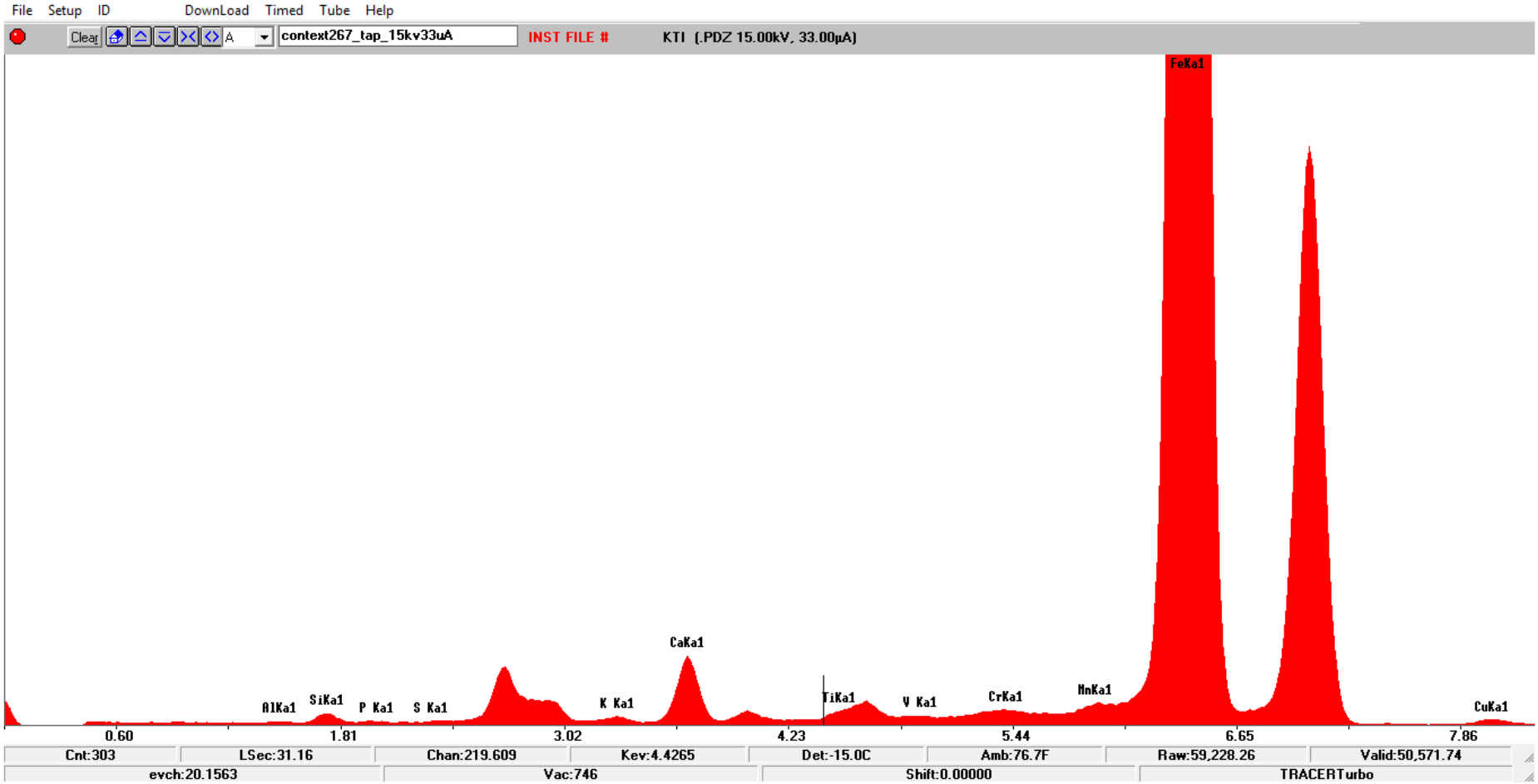

Figure 3 HH-XRF spectrum of the Flowed Slag sample (Context 267)

Context	267	343	433
MgO	n.d.	2.5	n.d.
Al_2O_3	5.0	2.9	5.4
SiO_2	13.8	10.4	22.7
P_2O_5	3.3	3.4	2.6
S	0.3	0.8	0.4
K_2O	0.1	0.1	n.d.
CaO	2.1	1.4	2.0
TiO_2	0.1	0.1	0.2
V_2O_5	0.2	0.1	0.2
Cr_2O_3	n.d.	n.d.	n.d.
MnO	0.2	0.3	0.2
FeO	74.8	78.0	66.3
CoO	n.d.	n.d.	n.d.
NiO	n.d.	n.d.	n.d.
CuO	n.d.	n.d.	n.d.
Total	10n.d.	10n.d.	10n.d.

Table 2 Semi-quantitative data derived from the HH-XRF analyses of the flowed slag samples (weight %, n.d. – not detected).

APPENDIX 1

HH-XRF Methodology for the Analysis of Non-Ferrous Residues

The instrument used is a Bruker S1 Turbosdr hand-held XRF instrument operating at 40kV. A beam of x-rays is generated in the instrument and focussed on the sample, the x-rays interact with the elements present in the sample resulting in the emission of secondary x-rays which are characteristic (in terms of their energy and wavelength) of the elements present in the sample. The energies of the secondary x-rays are measured and a spectrum generated showing a level of background noise with peaks of the elements present superimposed on the background noise. Samples will have analysed for 30 live seconds and the spectrum is stored. All elements heavier than calcium (Ca, Z=20), can be detected. The spectrum is assessed for the presence of non-ferrous metals. The technique is non-destructive.

Appendix 2 HH-XRF Methodology for the Analysis of Slags

The instrument used was a Bruker S1 Turbosdr hand-held XRF instrument operating at 15kV. The technique is non-destructive. A beam of x-rays is generated in the instrument and focussed on a fresh fractured surface of the sample, the x-rays interact with the elements present in the sample resulting in the emission of secondary x-rays which are characteristic (in terms of their energy and wavelength) of the elements present in the sample. The energies of the secondary x-rays are measured and a spectrum generated showing a level of background noise with peaks of the elements present superimposed on the background noise. Slag samples were analysed for 30 live seconds; the spectrum is stored and a normalised composition determined using a bespoke computer programme. All elements heavier than magnesium (Mg, Z=12), can be detected. The data is normalised and hence gives data showing relative (semi-quantitative) percentage of detected oxides.

gerry mcdonnell archaeometals

Dr Gerry McDonnell

Thursday, 9th May 2019

HEAVY METAL DRAIN SEDIMENT ASSESSMENT

D. Signorelli

Excavations at Hudson House revealed a large quantity of brick and stone capped box drains. Some of these drains were constructed directly on sand or clay deposits whereas others had wooden plank bases. Most drains contained sediment fills and these sediments were sampled to evaluate potential.

Twenty sediment samples were extracted during excavation. Out of this number three (samples from box drains [38], [232] and [316]) were chemically assessed for heavy metal toxicity by Precision Decisions and Lancrop Laboratories. These samples were assessed to investigate potential as it was uncertain what the samples would yield therefore the results from the heavy metal testing were viewed as open ended.

The samples were chosen based upon colour and type of box drain. One box drain had a wood base [316] the other two were constructed onto sand and clay. Each sample was a different colour: black (39), orangey brown (232) and medium grey (316).

Sample Number	Context	Description	Comments
70	15	Drain sediment	
2	39	Drain sediment	Silty black sediment within box drain [38] situated running parallel along the railway track closest to the Arrivals Platform within the confines of the Euston Truss canopy roofing. Does the black colour indicate a more toxic sediment?
4	50	Drain sediment	
5	50	Drain sediment	
41	54	Drain sediment	
48	92	Drain sediment	
42	128	Drain sediment	
54	130	Drain sediment	
6	160	Drain sediment	
52	192	Drain sediment	
53	193	Drain sediment	
50	194	Drain sediment	
51	195	Drain sediment	

7	232	Drain sediment	Orangey Brown sandy sediment within a box drain [233] located out with the main station area. Do lighter colourer sediments indicate less toxicity?
10	236	Drain sediment	
8	240	Drain sediment	
26	313	Drain sediment	
27	316	Drain sediment	A medium grey sticky sediment with lenses of sand within a box drain with a wooden plank base [321]. This drain is located along the same alignment as box drain [233] towards the breached archways to the west. Does this sediment have less toxicity than that collected from box drain [233].
28	329	Drain sediment	
25	332	Drain sediment	

Lancrop Laboratories

Analysis Results (SOIL)

Customer
LS ARCHAEOLOGY
4 LENDAL HOUSE
FULFORD PLACE
YORK
YO10 4FE

Distributor
PRECISION DECISIONS
THE OLD STATION WORKS
STATION LANE
SHIPTON BY BENNINGBROUGH
YO30 1BS

Sample Ref DRAIN SEDIMENT (39) SAMPLE 2

Date Received 15/01/2020 (Date Issued: 20/01/2020)

Sample No E385712/01

Crop NON STATED

Analysis	Result
Lead (mg/kg)	937.66
Nickel (mg/kg)	38.32
Zinc (mg/kg)	205.32
Copper (mg/kg)	556.25
Arsenic (mg/kg)	24.95
Cadmium (mg/kg)	1.02
Mercury (mg/kg)	0.42
Chromium (mg/kg)	20.45

Additional Comments
Any indicated Lime Requirement assumes a medium textured soil.
Additional technical bulletins are available at www.lancrop.com.

Please Note
Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request.

This report has been generated by Yara's Megalab™ software.

Released by Chris Lindley....Laboratory Manager on behalf of Lancrop Laboratories

Analytical Services
Tel: + 44(0) 1759 305116
Yara UK Limited - Pocklington
Email:ypl.laboratory@yara.com

Date Printed : 20/01/2020

Lancrop Laboratories

Analysis Results (SOIL)

Customer	LS ARCHAEOLOGY 4 LENDAL HOUSE FULFORD PLACE YORK YO10 4FE	**Distributor**	PRECISION DECISIONS THE OLD STATION WORKS STATION LANE SHIPTON BY BENNINGBROUGH YO30 1BS
Sample Ref	DRAIN SEDIMENT (232) SAMPLE 7	**Date Received**	15/01/2020 (Date Issued: 20/01/2020)
Sample No	E385712/02		
Crop	NON STATED		

Analysis	Result
Lead (mg/kg)	73.55
Nickel (mg/kg)	12.78
Zinc (mg/kg)	62.91
Copper (mg/kg)	61.13
Arsenic (mg/kg)	5.64
Cadmium (mg/kg)	0.42
Mercury (mg/kg)	0.46
Chromium (mg/kg)	12.19

Additional Comments

Any indicated Lime Requirement assumes a medium textured soil.
Additional technical bulletins are available at www.lancrop.com.

Please Note

Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request.

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Date Printed : 20/01/2020

Lancrop Laboratories

Analysis Results (SOIL)

Customer	LS ARCHAEOLOGY 4 LENDAL HOUSE FULFORD PLACE YORK YO10 4FE	**Distributor**	PRECISION DECISIONS THE OLD STATION WORKS STATION LANE SHIPTON BY BENNINGBROUGH YO30 1BS
Sample Ref	DRAIN SEDIMENT (316) SAMPLE 27	**Date Received**	15/01/2020 (Date Issued: 20/01/2020)
Sample No	E385712/03		
Crop	NON STATED		

Analysis	Result
Lead (mg/kg)	59.75
Nickel (mg/kg)	16.05
Zinc (mg/kg)	91.80
Copper (mg/kg)	70.31
Arsenic (mg/kg)	6.58
Cadmium (mg/kg)	0.53
Mercury (mg/kg)	0.17
Chromium (mg/kg)	15.80

Additional Comments
Any indicated Lime Requirement assumes a medium textured soil.
Additional technical bulletins are available at www.lancrop.com.

Please Note
Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request.

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Date Printed : 20/01/2020

The results from the heavy metal testing indicated that the black sediment from box drain [38] had significantly higher heavy metal results (lead, zinc and copper) compared to the two lightered coloured sediments.

The lining of the drain does not appear to impact upon the results.

The reasons for the higher heavy metal readings in box drain [38] are uncertain. There are many potential causes for these results:

- The drain was within the confines of the train station roof. Did the increased density of steam from the trains firing up and down create more heavy metal pollutants within the air that would condense into a more toxic water runoff?
- Did this drain [38] receive flow from a more toxic environment elsewhere within the station?
- Were preserving materials such as creosote and bitumen used in the treatment of the wooden railway sleepers or the Euston Truss roofing? Did this environment create a slow release of these heavy metals into the drainage system?

Comparable literature pertaining to the assessment of 19th century industrial/railway drainage systems is not forth coming therefore there is potential for further research into the sediments gathered from the excavation.

All twenty samples from the 19th century box drains uncovered at Hudson House have been retained including duplicates of the three already assessed. These samples will be stored in archive for further research.

MORTAR ASSESSMENT

Mark Wormersley

A bedding mortar sample (553) was extracted from feature [547]. Feature [547] was the foundation walls of the railway stables (Monument ID MYO3719). This sample was assessed (Womersley's, 2019) to create a record the characteristics of mortar used to construct key buildings associated with the Old Railway York. Its aggregate characteristics are: ash, silca based sand and inert under burnt lime.

MORTAR ANALYSIS REPORT

JOB REFERENCE	**Old Railway Station York**	SAMPLE	**1**	PAGE **1**

ANALYSIS DATE	**January 2020**
SITE	**Old Railway Station York**
CLIENT	**LS Archaeology**
DATE/ TAKEN RECEIVED	**December 2019**
CLIENT REQUIREMENTS	**Analyse mortar samples and suggest specification for replacement**
MORTAR DATING	**No**
LOCATION/ FUNCTION IN BUILDING	**Bedding mortar**
ENCLOSURES	**None**
CONDITION OF SAMPLE RECEIVED/ COLLECTED	**A representative sample was collected**

GENERAL COMMENTS/ SUMMARY

It is probable that the mortar was made up by volume from a combination of 1 part feebly hydraulic lime, although this hydraulic nature could have been created by the finer ash content, to 1.5-2 parts of silica sand, unburnt lime and waste ash.

MORTAR ANALYSIS REPORT

JOB REFERENCE	**Old Railway Station York**	SAMPLE	**1**	PAGE **2**

ANALYTICAL PROCEDURES

The selected sample of material was dried, weighed and examined both by eye and under a binocular microscope at x 20 & x 35 magnification. The sample was crushed, the binder separated from the aggregate by dissolution in dilute hydrochloric acid and the relative proportions of binder (lime, cement and gypsum) to aggregate determined. Aggregate (and other acid-insoluble materials) characterisation was undertaken by means of sieve separation and further microscopic examination.

The analysis and interpretation provide information on the composition and characteristics of the mortar sample(s) received by us. Assuming that the sample was representative of the mortar generally, then analysis will give a reasonable indication of the original materials and provide a basis for specification of repair or replacement mortars.

If more detailed information is required (for example for purposes of historic research) more sophisticated analytical procedures can be undertaken to determine chemistry and mineralogical composition.

MORTAR EXAMINATION AND ANALYSIS

PROCEDURE	**DESCRIPTION / COMMENTS**
PRELIMINARY EXAMINATION OF SAMPLE BY EYE	A dirty pink coloured mortar with visible lime inclusions
EXAMINATION OF PREPARED SAMPLE BY BINOCULAR MICROSCOPE x20 MAG	Some visible pink and clear quartz grains and ash

MORTAR ANALYSIS REPORT

JOB REFERENCE	**Old Railway Station York**	SAMPLE	**1**	PAGE **3**

ACID DISSOLUTION

PROCEDURE	**DESCRIPTION ~ COMMENTS**
10% HCL ACID DISSOLUTION	Easy to crush. In the first dissolution's a very vigorous reaction was witnessed
FILTER GRADE (PORE SIZE) & TYPE	Whatman Type 1

AGGREGATE SEPARATION

BS SIEVE Mesh Size	**Residue Retained in g's**	**Undissolved binder %**	**Aggregate wt excluding undissolved binder - gs**	**Aggregate weight %**	**Comments**
4.75 mm	0.9	15	0.77	3.5	Piece of brick and bound aggregate
2.36 mm	0.2	20	0.16	0.7	Red, clear and pink quartz and ash
1.18 mm	1.1	15	0.94	4.3	Red, clear and pink quartz and ash
0.60 mm (600µm)	7.3	1	7.2	33.1	Red, clear and pink quartz and ash
300 µm	9.2	0	9.2	42.3	Red, clear and pink quartz and ash
150 µm	2.2	0	2.2	10.1	Clear and pink quartz and ash
< 150 µm including filter residue	1.3	0	1.3	6	Clear and pink quartz and ash

All the quartz aggregate is sub-angular

MORTAR ANALYSIS REPORT

JOB REFERENCE	**Old Railway Station York**	SAMPLE	1	PAGE **4**

AGGREGATE CHARACTERISTICS

Ash, silica based sand and inert under burnt lime formed the main aggregate in the original mortar mix.

Because sand and gravel aggregates are ultimately derived from the weathering of solid rock most aggregates contain coarse grained rock fragments and finer mineral grains. Weathering breaks down the rock fragments within the aggregate into the constituent minerals, resulting in smaller and rounder particles; chemical weathering breaks down unstable minerals, such as feldspars, into clays which may be washed away, both processes eventually result in a quartz-rich sand.

CONSTITUENTS OF ANALYSIS SAMPLE

MATERIAL	*WEIGHT (g)*	COMMENTS
A: DRY WEIGHT OF-ANALYSIS SAMPLE	40.3	
B: DRY WEIGHT OF ALL INSOLUBLES	22.2	
C: DRY WEIGHT OF INSOLUBLE BINDER	0.43	
D: (B-C) DRY WEIGHT OF AGGREGATE	21.77	
E: (A-B+C)) DRY WEIGHT OF LIME & BINDERS	18.53	
OTHER		

MORTAR ANALYSIS REPORT

JOB REFERENCE	**Old Railway Station York**	SAMPLE	**1**	PAGE **5**

PROPORTIONS OF ANALYSIS SAMPLE

Relative Weights based upon analysis and on our experience of similar mixes

FEEBLY HYDRAULIC LIME: AGGREGATE RATIO

1: 1

PROBABLE ORIGINAL MIX

It is probable that the mortar was made up by volume from a combination of 1 part feebly hydraulic lime, although this hydraulic nature could have been created by the finer ash content, to 1.5-2 parts of silica sand, unburnt lime and waste ash.

Sample analysis, interpretation and report carried out by: Mark Womersley

ASSESSMENT OF BIOLOGICAL REMAINS FROM BULK AND COLUMN SAMPLES

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Palaeoecology Research Services **PRS 2020/05**

Summary

Seven bulk sediment samples, five column samples and a 'spot' sample of waterlogged wood, recovered during archaeological excavations at Hudson House, Toft Green, York, were submitted for an assessment of their bioarchaeological potential. The works were undertaken as part of the Hudson Quarter development of the site and encountered remains related to the earlier York railway station which was superseded by the current station in 1877. Other features and deposits of Romano-British (and ?Romano-British) date and undated ?alluvial deposits were also revealed.

Biological remains of 'ancient' origin were relatively sparse in the bulk sediment samples and the column samples contained no interpretatively valuable microfossils or macrofossils. Some interpretation was possible, however, and the remains from a bulk sample from the secondary fill of a late Romano-British pit indicated that it contained a mix of waste materials from human activity and appeared to have been deliberately backfilled; there was no evidence to suggest that the feature functioned as a cess pit, however. The ?alluvial deposits appeared to represent sediment deposited in low-energy environments at the limits of repeated flooding events and most likely date to the Romano-British period (although the possibility of a peri-glacial origin has also been suggested and, as there was no direct dating evidence recovered, this cannot currently be wholly excluded). Remains from the bulk samples from three (?)Romano-British dumps and the fill of a ?natural depression within the ?alluvial deposits suggested that these could represent deliberate attempts to consolidate the ground against further flooding and to backfill the depression.

The wood 'spot' sample of the base lining of a 19th century drain indicated that the feature has held ground water sufficiently to create localised anoxic waterlogged conditions and allow these to persist at least to some degree. All five of its larger fragments, originally parts of a single 'plank', were independently identified as a ring-porous wood species and probably oak (cf. Quercus*) – a durable wood which has been employed for a variety of construction purposes since antiquity.*

No remains suitable for radiocarbon dating of the deposits were recovered and no further study of the biological remains considered by this report is warranted.

Keywords: Hudson House; Toft Green; York; assessment; (?)Romano-British; late Romano-British; late 4th-early 5th century; 19th century; plant remains; charred plant remains (trace); charcoal (trace); wood; invertebrate remains (trace); marine shellfish (trace); vertebrate remains

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29 January 2020

Introduction

Archaeological excavations were undertaken by LS Archaeology at Hudson House, Toft Green, York (approximate NGR SE 598 515). The works were undertaken as part of the Hudson Quarter development of the site and encountered remains and features, including a wood-lined drain, related to the earlier York railway station which was superseded by the current station in 1877. Other features and deposits of Romano-British (and ?Romano-British) date and undated ?alluvial deposits were also revealed.

Seven bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al*. 1992), five column samples and a wood 'spot' sample (from the 19th century wood-lined drain), were submitted to Palaeoecology Research Services Limited, Kingston upon Hull, for an assessment of their bioarchaeological potential.

Methods

Bulk sediment samples

The lithologies of the sediment samples were recorded, using a standard *pro forma*, prior to processing (of subsamples or in their entirety) for the recovery of plant and invertebrate macrofossils, broadly following the techniques of Kenward *et al*. (1980), producing a washover and a residue for each.

No preservation by anoxic waterlogging was observed and the washovers were dried prior to recording. The residues were essentially mineral in nature and were also dried prior to separation into fractions (using 1, 4 and 10 mm sieves) to facilitate the sorting and recording of their components. The weights and descriptions of the dry residues were recorded after sorting. Weights and descriptions of inorganic and environmental material refer to the larger pieces which have been extracted and reserved; smaller fragments remain in the residues and are not included. All remains (biological and artefactual) were sorted to 1 mm and the less than 1 mm fractions retained unsorted. The residues (including the less than 1 mm fractions) were scanned for magnetic material.

The processed sample fractions were examined for plant, invertebrate and vertebrate remains, using a low-power binocular microscope (x7 to x 45) where necessary. The components were recorded either as actual counts or via a five-point semi-quantitative scale: 1 – few/rare, up to 3 individuals/items or a trace level component of the whole; 2 – some/present, 4 to 20 items or a minor component; 3 – many/common, 21 to 50 or a significant component; 4 – very many/abundant, 51 to 200 or a major component; and 5 – super-abundant, over 200 items/individuals or a dominant component of the whole. Processed sample fractions were scanned until no new remains were observed and a sense of the abundance of each taxon or component (relative to the processed fraction as a whole) was achieved. The abundance of recovered organic and other remains within the sediments as a whole may be judged by comparing the washover weights and the quantities of remains recovered from the residues with the size of the processed samples.

Charcoal identifications were attempted for a selection of fragments of over 4 mm in radial cross-section. Pieces were broken to give a clean radial cross-sectional surface and the anatomical structures were examined using a low-power binocular microscope (x7 to x45). Identifications were

attempted by comparison with modern reference material, where possible, and with reference to published works (Hather 2000; Schoch *et al*. 2004).

Marine shell fragments recovered were identified as closely as possible, principally with reference to Hayward and Ryland (1995); nomenclature follows this work. No other 'ancient' invertebrate remains were recovered.

Where possible, vertebrate remains were identified to species or species group using modern comparative reference material and published works (e.g. Schmid 1972). Remains that could not be identified to species were grouped into categories: large mammal (assumed to be cattle, horse or large deer (cervid)), medium-sized mammal 1 (assumed to be sheep/goat (caprine), pig or small deer), medium-sized mammal 2 (from a cat or hare-sized animal), small mammal (i.e. smaller than rat-sized), small vertebrate (small mammal, bird, amphibian etc), unidentified fish and completely unidentifiable. Nomenclature for mammals follows Harris and Yalden (2008). The bones were also examined for evidence of dog gnawing, burning, butchery and fresh breaks which was noted where applicable.

Artefacts recovered from the processed samples were recorded in brief, bagged and labelled to be returned to LS Archaeology and forwarded to the appropriate specialist(s), if warranted.

Small quantities of sediment were examined as microfossil 'squash' subsamples. These were examined using the 'squash' technique of Dainton (1992), originally designed specifically to assess the content of eggs of intestinal parasitic nematodes; however, this method routinely reveals the presence of other microfossils, such as pollen and diatoms, and, where present, these were also noted. The assessment slides were scanned at x150 magnification and at x600 where necessary.

During recording, consideration was given to the suitability of the remains for submission for radiocarbon dating by standard radiometric technique or accelerator mass spectrometry (AMS).

Wood sample

The wood comprising the 'spot' sample recovered from Context 130 was visually inspected, measured and described.

Small pieces were broken from the larger wood fragments to give a clean radial cross-sectional surface and the anatomical structures were examined using a low-power binocular microscope (x7 to x45). Species identifications were attempted by comparison with modern reference material, where possible, and with reference to published works (Hather 2000; Schoch *et al*. 2004).

Column samples

The five column samples were collected by LS Archaeology and wrapped in plastic film to prevent drying out. One column (Sample 17) represented 220 mm of Context 257 and the four others (Samples 14, 15, 16 and 18) were from Context 292 – Samples 16 and 18 overlapped and represented 900 mm, with Samples 14 and 15 representing 240 mm and 500 mm, respectively, at two other sampling points. Contexts 257 and 292 were equivalent, however, with Context 257 sampled as part of the main excavation and Context 292 representing the same deposit encountered in a sondage cut to investigate the nature and extent of the irregular dark ?dump deposit Context 267.

The sediment represented in the column sample from Context 257 (Sample 17) and the longest column sample from Context 292 (overlapped Samples 16 and 18, lowermost first) were recorded (following the same protocol as for the bulk sediment samples), together with notes regarding inclusions present and their orientation. The two remaining column samples from Context 292 (Samples 14 and 15) were retained undisturbed against the possibility of further study.

Sequences of subsamples were extracted from the approximate centre of both columns and examined for microfossils via the 'squash' technique (as described above for similar subsamples from the bulk sediment samples); the focus of the investigations here being remains which could provide information regarding deposition (e.g. diatoms).

Results

Bulk sediment samples

The results from the investigation of the bulk sediment samples are presented below in context number order. Archaeological information, provided by LS Archaeology, is given in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment follows (in round brackets) after the sample numbers.

Context 250 [secondary fill of pit [251]; Romano-British – late 4th-early 5th century pottery was recovered on site]

Sample 13/T (12.75 kg/9 litres sieved to 300 microns with washover and microfossil 'squash'; no unprocessed sediment remains)

Moist, mid grey-brown to mid/dark grey (mottled at mm- and cm-scaled), unconsolidated (working soft), silt. Stones (20 to over 60 mm) were abundant, smaller stones (6 to 20 mm) were common and bone and brick/tile fragments were present.

The tiny washover (dry weight 27.3 g/~20 ml) was mostly sand (abundance score 5), with small amounts (all score 2) of ?mortar (to 10 mm), bone (to 10 mm – largely indeterminate but including a few small mammal long bone fragments (score 1), a small mammal (mouse/vole – murine/microtine) incisor, and a few other indeterminate small vertebrate fragments (score 1)), coal (to 5 mm), cinder (to 7 mm) and small stones (to 4 mm), and a trace of indeterminate rectilinear charcoal (to 2 mm; score 1).

The large residue (dry weight 7602.0 g: >10 mm – 6934.6 g; 4-10 mm – 210.1 g; 1-4 mm – 195.1 g; <1 mm – 262.2 g) was dominated by, mostly large, stones (to 150 mm; score 5), with a small component of sand (score 2 – almost all of the less than 1 mm fraction). Biological remains were restricted to a little bone (to 40 mm; 66.7 g; score 3 – mostly indeterminate fragments of large or medium-sized mammal 1 bone, with one ?pig (cf. *Sus* f. domestic phalanx) and six fragments of medium-sized mammal 2 including one vertebra) and traces of shell (to 20 mm; 1.2 g; score 1 – 12 fragments of ?oyster (cf. *Ostrea edulis* L.) shell) and indeterminate rectilinear charcoal (to 7 mm; <0.1 g; score 1) but there were rather larger quantities of artefactual materials. These comprised pieces of brick/tile (to 95 mm; 399.7 g; score 2), ?mortar (to 40 mm; 63.4 g; score 2 – perhaps rotted oolitic limestone?), four sherds of pottery (to 45 mm; 5.4 g), a little metallic slag (to 35 mm; 49.3 g; score 2) and two corroded iron ?nails (to 25 mm; 5.9 g). The trace level finer magnetic component (to 5 mm; 0.6 g; score 1) was mostly ?heat-affected sand, smalls stones (to 5 mm) and coal (to 2 mm) but also included a few flakes (to 3 mm) and spheres (to 1 mm) of hammerscale.

The 'squash' subsample was almost entirely inorganic, with just a trace of organic detritus (<5%). A few fragments of fungal hyphae were noted but there were no intestinal parasite eggs or other interpretatively valuable microfossils (e.g. pollen, diatoms) present.

Context 258 [infill of ?natural depression [259] or inclusion with alluvial deposit [257]?; ?Romano-British]

Sample 24/T (11.75 kg/9 litres sieved to 300 microns with washover and microfossil 'squash'; no unprocessed sediment remains)

Moist, varicoloured (jumbled and occasionally somewhat layered shades of yellow-brown, orange-brown, brown and grey-brown from light to mid), brittle (and somewhat layered) to crumbly, slightly silty fine sand. Stones (2 to over 60 mm) were abundant and a little brick/tile and rotted ?mortar was present.

The minute washover (dry weight 6.6 g/~5 ml) was mostly coal (to 12 mm) and cinder (to 9 mm) – both score 2 – with frequent sand (score 3). Minor components were a little bone (to 6 mm; score 2 – largely indeterminate but including a few small vertebrate long bone fragments (score 1)), ?mortar (to 5 mm; score 2) and indeterminate rectilinear charcoal (to 4 mm; score 2), and a few small 'beads' of vitreous ('glassy') slag (to 2 mm; score 1).

The medium-sized residue (dry weight 3243.9 g: >10 mm – 2518.7 g; 4-10 mm – 106.9 g; 1-4 mm – 165.4 g; <1 mm – 452.9 g) was mostly stones (to 140 mm; score 5), with some sand (score 2 – almost all of the less than 1 mm fraction). Minor components were brick/tile (to 65 mm; 83.2 g; score 2), mortar (to 27 mm; 25.3 g; score 2), bone (to 45 mm; 17.6 g; score 2 – wholly indeterminate other than a single unidentified fish vertebra), traces of metallic slag (to 20 mm; 4.9 g; five pieces), shell (to 9 mm; <0.1 g; five fragments – one of cockle (*Cerastoderma edule* (L.), two of ?oyster, and two indeterminate) and root cast (to 10 mm; 0.5 g; two pieces), and two sherds of pottery (to 46 mm; 35.2 g). The minute magnetic component (to 5 mm; 0.6 g' score 1) was mostly ?heat-affected sand and small stones but included a few flakes (to 2 mm) and spheres (to 1 mm) of hammerscale and a trace of amorphous slag (to 3 mm).

The 'squash' subsample was almost entirely inorganic, with the barest trace of uncharred organic detritus (<1%). There were some black flecks of ?ash/coal (score 2) but no microfossils were present.

Context 267 [irregular dark ?dump deposit – similar to but later than Contexts 268 and 286 (see below); Romano-British – 4th century pottery was recovered on site]

Sample 19/T (10.25 kg/8 litres sieved to 300 microns with washover and microfossil 'squash'; no unprocessed sediment remains)

Moist, mix of light/mid orange-brown, unconsolidated fine sand and mid/dark grey brittle to crumbly or unconsolidated (working more or less soft), fine sandy silt (overall appearance mottled at mm- and cm-scales), with very occasional white flecks (to 7 mm). Fragments of large mammal bone, brick/tile and stones (2 to over 60 mm) were present.

The tiny washover (18.1 g/~20 ml) was mostly coal (to 24 mm; score 5) and cinder (to 8 mm; score 5), with frequent sand (score 3). Bone fragments were also fairly common (to 10 mm; score 3). Most were indeterminate fragments (to 10 mm; score 3) but there was also occasional small vertebrate bone (to 3 mm; score 2), including long bone fragments and a vertebra, some of which *may* be identifiable to further study – all of the small vertebrate material was of rather 'fresh' appearance, however, and may well be intrusive. Other minor components were some 'crumbs' of ?mortar (to 11 mm; score 2), 'beads' of vitreous slag (to2 mm; score 2) and a little charcoal (to 17 mm, but almost all less than 4 mm; score 2). The last was all rectilinear fragments and these were very fragile – the largest was partially identified as of a diffuse-porous species but three other crumbled when species identification was attempted and remained wholly indeterminate.

The rather small residue (dry weight 2088.9 g: >10 mm – 1151.5 g; 4-10 mm – 224.4 g; 1-4 mm – 222.1 g; <1 mm – 490.9 g) was mostly stones (to 85 mm; score 5), with some sand (score 2 – almost all of the less than 1 mm fraction). Artefactual material from the residue consisted of pieces of brick/tile (to 90 mm; 141.2 g; score 2), mortar (to 40 mm; 47.0 g; score 2), metallic slag (to 20 mm; 14.0 g; score 2) and two sherds of pottery (to 25 mm; 5.9 g), with biological remains restricted to some bone (to 95 mm; 72.9 g; score 2 – almost all indeterminate fragments of large or medium-

sized mammal 1 bone, with the largest being a distal end of a cattle (*Bos* f. domestic) metatarsal; no evidence of butchery or gnawing was evident but the bone's surfaces were rather eroded) and a trace of shell (to 7 mm; 1.5 g; three indeterminate ?marine shell fragments). The tiny finer magnetic component (to 7 mm; 1.5 g; score 1) was mostly ?heat-affected small stones (to 7 mm) and coal (to 3 mm), and a little sand, with a few flakes (to 2 mm) and spheres (to 1 mm) of hammerscale also noted.

The 'squash' subsample was almost entirely inorganic, with just the barest trace of organic detritus (~5%). Black flecks of microscopic ?ash/coal were frequent (score 3) but there were no interpretatively valuable microfossils present.

Context 268 [irregular dark ?dump deposit – similar to Context 267 (see above) and Context 286 (see below) but earlier than the first and later than the second; ?Romano-British]

Sample 20/T (10.75 kg/8.25 litres sieved to 300 microns with washover and microfossil 'squash'; no unprocessed sediment remains)

Moist, mix of light/mid brown, unconsolidated, fine sand and mid/dark grey, brittle to crumbly (working soft), fine sandy silt (overall appearance mottled at mm- and cm- scales). Stones (2 to over 60 mm) were present.

The tiny washover (dry weight 10.6 g/~10 ml) was mostly sand (score 5) and coal (to 9 mm; score 4), with frequent cinder (to 7 mm; score 3). Occasional bone fragments (to 10 mm; score 2) were mostly small vertebrate remains (to 9 mm; score 2) including long bone fragments and of rather 'fresh' appearance and perhaps intrusive, with a few other wholly indeterminate fragments (to 10 mm; score 1). Other probably intrusive remains noted were a small number of earthworm egg capsules (score 2). There were also occasional 'beads' of vitreous slag (to 3 mm; score 2) and some rather fragile, rectilinear charcoal (to 13 mm, but almost all less than 4 mm; score 2). The largest charcoal fragment and one other were partially identified as diffuse-porous, two other fragments were ring-porous and a fifth crumbled and could not be identified.

The medium-sized residue (dry weight 2678.9 g: >10 mm – 1315.4 g; 4-10 mm – 257.9 g; 1-4 mm – 319.0 g; <1 mm – 786.6 g) was mostly stones (to 120 mm; score 5) and sand (score 3 – almost all of the less than 1 mm fraction although this did contain frequent small (unsorted) fragments of coal and brick/tile). Other components were larger brick/tile fragments (to 57 mm; 76.5 g; score 3), four sherds of pottery (to 47 mm; 33.7 g), mortar (to 20 mm; 19.1 g; score 2), metallic slag (to 30 mm; 16.2 g; score 2 – including one sphere/ball (to 5 mm; <0.1 g)), bone (to 21 mm; 16.0 g; score 3 – almost all indeterminate, including four burnt fragments, but with one small mammal (mouse/vole) incisor (to 4 mm; <0.1 g) which was of rather 'fresh' appearance and probably intrusive), and traces of coal (to 5 mm; <0.1 g; score 1), shell (to 8 mm; <0.1 g; three indeterminate fragments) and charcoal (to 7 mm; <0.1 g; three indeterminate rectilinear fragments). The tiny component of finer magnetic material (to 8 mm; 1.3 g; score 1) was mostly ?heat-affected sand and small sediment 'crumbs'/concretions (including two pieces of ?root cast) but there was also a little amorphous slag (to 2 mm).

The 'squash' subsample was almost entirely inorganic, with a little organic detritus (<10%). A few fragments of fungal hyphae were noted but there were no interpretatively valuable microfossils present.

Context 286 [irregular dark ?dump deposit – similar to but earlier than Contexts 268 and 286 (see above); ?Romano-British]

Sample 22/T (10.5 kg/8.25 litres sieved to 300 microns with washover and microfossil 'squash'; no unprocessed sediment remains)

Moist, varicoloured (jumbled shades of brown, orange-brown, grey-brown and grey from light/mid to mid/dark – some lumps predominantly mid/dark to dark grey internally), brittle to crumbly or unconsolidated (working slightly soft), silty fine sand. Stones (2 to over 60 mm) and pieces of ?brick/tile were present.

The tiny washover (dry weight 10.9 g/~10 ml) was mostly coal (to 7 mm; score 5) and abundant sand (score 4). The occasional bone fragments (to 13 mm; score 2) were mostly indeterminate (to 11 mm; score 2) but included a few small mammal long bones (to 13 mm; score 1 – at least one of which was of very 'fresh' appearance) and an indeterminate fish dentary fragments (to 7 mm). Other components were uncharred elder (*Sambucus nigra* L.) fruits (score 2 – perhaps contaminants), ?mortar (to 7 mm; score 2), indeterminate rectilinear charcoal (to 4 mm; score 2) and a few small 'beads' of vitreous ('glassy') slag (to 2 mm; score 1).

The rather small residue (dry weight 1636.6 g: >10 mm – 962.0 g; 4-10 mm – 113.2 g; 1-4 mm – 131.0 g; <1 mm – 430.4 g) was mostly stones (to 97 mm; score 5), brick/tile (to 100 mm; 604.2 g; score 5) and sand (score 3 – almost all of the less than 1 mm fraction although this did contain frequent small (unsorted) fragments of coal and lesser quantities of ?brick/tile and ?mortar). Other components were mortar (to 45 mm; 64.5 g; score 2), bone (to 30 mm; 6.5 g; almost all indeterminate, including five burnt fragments, but with one unidentified small vertebrate bone which was of rather 'fresh' appearance and probably intrusive), and traces of coal (to 10 mm; ~0.1 g; score 1) and shell (to 13 mm; <0.1 g; score 2 – mostly ?oyster fragments (score 2) with a few of ?mussel (cf. *Mytilus edulis* L.) (score 1)). The minute magnetic component (to 2 mm; 0.5 g; score 1) was mostly ?heat-affected sand and fine coal (to 2 mm) but there were also a few flakes and spheres (both to 1 mm) of hammerscale.

The 'squash' subsample was almost entirely inorganic, with the barest trace of uncharred organic detritus (<1%) but frequent black flecks of microscopic ?ash/coal (score 3). A few fragments of fungal hyphae (score 1) but there were no interpretatively valuable microfossils present.

Context 287 [sand deposit between Context 286 and 267 (see above) – probably re-deposited as contained pottery; ?Romano-British]

Sample 21/T (10.75 kg/8.5 litres sieved to 300 microns with washover and microfossil 'squash'; no unprocessed sediment remains)

Moist, varicoloured (jumbled shades of brown, grey-brown and predominantly orange-brown from light to mid), brittle to crumbly or unconsolidated (working soft), fine sandy silt. Stones (2 to over 60 mm) and pottery were present.

The small washover (dry weight 52.5 g/~60 ml) was mostly sand (score 5), with abundant cinder (to 14 mm, but almost all less than 2 mm; score 4) and small 'crumbs' of undisaggregated (?indurated/burnt) sediment (to 1 mm; score 4), and frequent coal (to 8 mm; score 3). There were also occasional bone fragments (to 31 mm, but all bar one to 10 mm; score 2 – the largest and some (score 2) other fragments were indeterminate pieces of bones of larger animals but there were a few indeterminate small vertebrate fragments (score 1)), and a little mortar (to 5 mm; score 2) and indeterminate rectilinear charcoal (to 3 mm; score 2).

The small residue (dry weight 678.4 g: >10 mm – 485.4 g; 4-10 mm – 36.1 g; 1-4 mm – 50.5 g; <1 mm – 106.4 g) was mostly stones (to 89 mm; score 5) and a little sand (score 2 – almost all of the less than 1 mm fraction although this did contain frequent small (unsorted) fragments of coal and lesser quantities of ?brick/tile). There was also a little larger brick/tile (to 42 mm; 24.6 g; score 2) and bone (to 58 mm; 9.6 g; score 2 – all indeterminate fragments, including one which was from a medium-sized 1 or large mammal rib and two others which were burnt), two sherds of

pottery (to 70 mm; 35.7 g), traces of coal (to 8 mm; <0.1 g; score 1) and shell (to 6 mm; <0.1 g; two indeterminate fragments), and a corroded iron object (to 33 mm; 14.5 g; perhaps part of a nail or bolt?). The minute magnetic component (to 2 mm; <0.1 g) was mostly ?heat-affected and but there were also a few flakes and spheres of hammerscale (both to 1 mm).

The 'squash' subsample was almost entirely inorganic, with frequent black flecks of microscopic ?ash/coal (score 3). A few fragments of fungal hyphae (score 1) but there were no interpretatively valuable microfossils present.

Context 292 [layered natural deposit; undated]

Sample 23/T (15.5 kg/12 litres sieved to 300 microns with washover and microfossil 'squash'; approximately 12 litres of unprocessed sediment remain)

Mostly a moist, light yellow-brown to light/mid orange-brown (mottled at a mm-scale), unconsolidated slightly silty fine sand, with a lesser proportion of moist, light/mid grey/grey-brown, soft or crumbly (working plastic), clay. Stones (2 to 6 mm and over 60 mm) were present. Note: layering noted on site not preserved within the bulk sample.

The small washover (dry weight 57.8 g/~70 ml) was almost all fine coal (to 4 mm, but almost all less than 2 mm; score 5), with some sand (score 2) and a few very small stones (to 3 mm: score 1).There was also a largely intact (all the main body components were present and articulated – legs and antennae were missing) *Nebria* ?*brevicolis* (Fabricius) ground beetle but this was almost certainly a modern contaminant of the sample.

The small residue (dry weight 1144.3 g: >10 mm – 457.6 g; 4-10 mm – 0.0 g; 1-4 mm – 94.2 g; <1 mm – 592.5 g) was mostly sand (score 5 – almost all of the less than 1 mm fraction, although there were also some unsorted black flecks of ?coal within this) and stones (score 5 – mostly in the form of a single large, to 100 mm, stone which formed the entirety of the >10 mm fraction). No biological or artefactual remains were present and there was no magnetic component to the residue.

The 'squash' subsample was entirely inorganic. There were occasional black flecks of microscopic ?ash/coal (score 2) but no interpretatively valuable microfossils were present.

Wood sample

The wood sample was recovered from Context 130, a 'sticky clay silt' fill within a 19th century drain [129], encountered during trial-trenching; the wood forming part of the base of the lining of the feature.

The sample comprised five larger pieces of waterlogged wood which were all parts of an original whole that broke during recovery (LS Archaeology pers. comm.), together with ~40 smaller heavily decayed fragments (to 22 mm); the latter were not considered further.

The largest piece of wood measured 732 mm (long) by 50 mm (maximum width, tapering to 17 mm at one end) by 16 mm (thick). No bark remained on the wood and, based on this and its uniformity of thickness, it appeared to be part of a cut 'plank'; no tool marks were evident but the surfaces of the wood were very soft and any evidence of woodworking may well have been lost to decay. A small piece was broken off from the tapering end for species identification and revealed the wood to be ring-porous and probably oak (cf. *Quercus*); definitive identification was hampered by the degree of decay.

Two of the other larger fragments were very similar in overall morphology, lacking bark and also independently identified as probable oak. These fragments were 318 (long) by 27 mm (maximum width, tapering to 9 mm at one end) by 14 mm (thick) and 52 mm (long) by 16 mm (maximum width) by 16 mm (thick).

The two remaining fragments had the following dimensions: 215 mm (long) by (25 mm maximum width) by 16 mm (thick), and 320 mm (long) by 25 mm (maximum width) by 16 mm (thick). They both lacked bark and were, again, independently identified as probable oak. Superficially, both of these fragments appeared to have been roughly rounded (in cross-section) at one end (the longer, 320 mm, fragment actually appearing rounded at both ends) but this was probably a result of being crushed during recovery – the extremities of the wood fragments were particularly soft owing to heavy decay. Again, there were no discernible tool marks on the wood fragments.

All five of the larger wood fragments exhibited narrow annual growth rings (of 1 to 2 mm) with very little curvature indicating that the original 'plank' derived from a substantial branch or trunk heartwood which had grown rather slowly.

Column samples

The results of the investigation of the column samples are presented below.

Context 257, Sample 17 – total length 240 mm

Sediment component divisions and the inclusion slope upwards from left to right as seen in the open face of the column sample (i.e. this would have been an upward slope from right to left in section as the column was taken using single open-faced plastic trunking) at an angle of approximately 10 degrees to the horizontal.

0 to 22 mm from base: Moist, light yellow-brown and light/mid grey-brown (mottled at a mm-scale), unconsolidated, fine sand.

22 to 26-35 mm from base: Moist, light/mid grey-brown, unconsolidated, silty fine sand.

26-35 to 191-200 mm from base: Predominantly fine sand as seen at 0-22 mm from base, with irregular inclusions of silty fine sand as seen immediately underlying – to 5 mm throughout but to 25 mm and more frequent at 140-190 mm from base.

191-200 to 198-205 mm from base: A thin 5-7 mm thick 'layer' of silty fine sand as seen at 22 to 26-35 mm from base.

198-205 to 223-232 mm from base: As seen at 26-35 to 191-200 mm from base but irregular inclusions of silty fine sand only to 5 mm.

223-232 to 224-233 mm from base: An inclusion of a 1 to 1.5 mm thick (thickest in second quarter of column tin from the left hand side as viewed) band of dark grey ?ash.

224-233 mm from base: As 198-205 to 223-232 mm from base.

Microfossil subsamples

Nine microfossil 'squash' subsamples were extracted from Sample 17 through Context 257 at 10, 26, 60, 100, 150, 200, 210, 220 and 230 mm from the base of the column.

Subsample at 10 mm from base of Sample 17, Context 257: Almost entirely inorganic but with frequent black flecks of microscopic ?ash/coal (abundance score 3). No interpretatively valuable microfossils were present.

Subsample at 26 mm from base of Sample 17, Context 257: Almost entirely inorganic with a few black flecks of microscopic ?ash/coal (score 1). No interpretatively valuable microfossils were present. Subjectively, there were frequent (score 3) mineral grains which were both smaller (finer) and larger (coarser) than those seen in the subsample at 10 mm from the base of the column.

Subsample at 60 mm from base of Sample 17, Context 257: As subsample at 10 mm from the base of the column but with only a few (score 1) black flecks of ?ash/coal (score 1) and frequent (score 3) coarser mineral grains as seen in the subsample at 26 mm from the base of the column. No interpretatively valuable microfossils were present.

Subsample at 100 mm from base of Sample 17, Context 257: Almost entirely inorganic with a few fragments of fungal hyphae (score 1). No interpretatively valuable microfossils were present. Similar mineral composition to that seen in the subsample at 10 mm from the base of the column.

Subsample at 150 mm from base of Sample 17, Context 257: As seen in the subsample at 26 mm from the base of the column but black flecks of ?ash/coal slightly more numerous (score 2). No interpretatively valuable microfossils were present. Similar mineral composition to that seen in the subsample at 26 mm from the base of the column.

Subsample at 200 mm from base of Sample 17, Context 257: Almost entirely inorganic with a trace of uncharred organic detritus (<5%), which included a single indeterminate plant tissue fragment, occasional fragments of fungal hyphae (score 2), and a few black flecks of microscopic ?ash/coal (score 1). No interpretatively valuable microfossils were present. Similar mineral composition to that seen in the subsample at 26 mm from the base of the column.

Subsample at 210 mm from base of Sample 17, Context 257: As seen in the subsample at 100 mm from the base of the column.

Subsample at 220 mm from base of Sample 17, Context 257: Almost entirely inorganic with a few black flecks of microscopic ?ash/coal (score 1) and fragments of fungal hyphae (score 1). No interpretatively valuable microfossils were present. Similar mineral composition to that seen in the subsample at 26 mm from the base of the column.

Subsample at 230 mm from base of Sample 17, Context 257: As seen in the subsample at 150 mm from the base of the column.

Context 292, Samples 16 (lower – 500 mm) and 18 (upper – 590 mm) overlapped by 190 mm – total length 900 mm

0 to 100 mm from base: Moist, light yellow/yellow-brown and light/mid brown (mottled at a mm-scale), unconsolidated, fine sand. Occasional black flecks (to 1 mm) of ?ash/coal present throughout.

100 to 130 mm from base: As seen at 0-100 mm from base but loose within column.

130 to 160 mm from base: Moist, mid grey-brown, unconsolidated, fine sandy silt/silty fine sand. Occasional black flecks (to 1 mm) of ?ash/coal present throughout.

160 to 320-330 mm from base: Predominantly as seen at 0-100 mm from base with bands of fine sandy silt/silty fine sand as seen at 130-160 mm from the base of the column sloping upwards (from right to left as seen in the column – and *in situ* as the column was taken using a double open-faced tin) at approximately 10 degrees to horizontal. Bands (right hand side measurements shown first) at 208-215 to 222-230 mm (maximum of 9 mm thickness), 234-237 to 250-255 mm (to 9 mm thick), 246-257 to 259-274 mm (to 19 mm thick), 262-277 to 285-288 mm (to 12 mm thick), 295-301 to 304-309 mm (to 8 mm thick). Small horizontal 'lens' inclusion (to 15 mm by 4 mm thick) of black ?ash/coal at 161-165 mm from base and a thin band (maximum thickness 3.5 mm more or less centrally within the column, thinning to 1 mm at both extremes) sloping upward from right to left at 242 mm to 245 mm.

320-334 mm to 330-338 mm from base: As seen at 130-160 mm with one thin (<1 mm thick) band of sand as seen at 0-100 mm from base sloping upwards from right to left from 323 mm to 334 mm from the base of the column.

334-420 to 338-370 mm from base: Rather jumbled, 'marbled' (mottled at mm- and cm-scales) appearance mix of sand as seen at 0-100 mm and fine sandy silt/silty fine sand as seen at 130-160 mm from the base of the column. This component of the sequence had a rather 'swirled' appearance with a sinuous upper boundary delineated by a thin (< 1mm) very dark grey/black line of ?ash/coal.

370-420 to 500 mm from base (upper limit of Sample 16): As 334-420 to 338-370 (immediately below) but rather loose in tin. The equivalent section at the base of Sample 18 was more loose and collapsed within the column.

500 to 784 mm from base: As seen immediately below in Sample 18, i.e. jumbled and loose and collapsed within column.

784 to 853 mm from base: As seen 334-420 to 338-370 mm from base but without upper boundary delineation. Small horizontal 'lens' inclusion to 6 mm by 4 mm thick) of black ?ash/coal at 824-828 mm from the base of the column.

853-900 mm from base: Void – no recovery.

Microfossil subsamples

Eighteen microfossil 'squash' subsamples were extracted from Samples 16 and 18 (14 from within the lower 500 mm represented in Sample 16 and four from the upper 400 mm represented in Sample 18) through Context 292 at 50, 145, 162, 190, 210, 240, 255, 270, 290, 310, 327, 350, 380, 450, 550, 650, 750 and 830 mm from the base of the column.

Subsample at 50 mm from base of Sample 16, Context 292: Almost entirely inorganic but with some black flecks of microscopic ?ash/coal (abundance score 2). No interpretatively valuable microfossils were present.

Subsample at 145 mm from base of Sample 16, Context 292: Almost entirely inorganic but with some black flecks of microscopic ?ash/coal (score 2). Subjectively, there were frequent (score 3) mineral grains which were both smaller (finer) and larger (coarser) than those seen in the subsample at 50 mm from the base of the column. No interpretatively valuable microfossils were present.

Subsample at 162 mm from base of Sample 16, Context 292 (within black inclusion): Almost entirely black flecks of microscopic ?ash/coal (abundance score 5), with a little inorganic mineral content (<5%). No interpretatively valuable microfossils were present.

Subsample at 190 mm from base of Sample 16, Context 292: As seen in the subsample at 50 mm from the base of the column.

Subsample at 210 mm from base of Sample 16, Context 292: As seen in the subsample at 145 mm from the base of the column.

Subsample at 240 mm from base of Sample 16, Context 292: As seen in the subsample at 145 mm from the base of the column.

Subsample at 255 mm from base of Sample 16, Context 292: As seen in the subsample at 145 mm from the base of the column.

Subsample at 270 mm from base of Sample 16, Context 292: As seen in the subsample at 145 mm from the base of the column.

Subsample at 290 mm from base of Sample 16, Context 292: As seen in the subsample at 50 mm from the base of the column.

Subsample at 310 mm from base of Sample 16, Context 292: As seen in the subsample at 145 mm from the base of the column.

Subsample at 327 mm from base of Sample 16, Context 292: As seen in the subsample at 145 mm from the base of the column.

Subsample at 350 mm from base of Sample 16, Context 292: As seen in the subsample at 50 mm from the base of the column.

Subsample at 380 mm from base of Sample 16, Context 292: As seen in the subsample at 145 mm from the base of the column, with the addition of a few fragments of fungal hyphae (score 1).

Subsample at 450 mm from base of Sample 16, Context 292: As seen in the subsample at 380 mm from the base of the column.

Subsample at 550 mm from base of Sample 16 (240 mm from base of Sample 18), Context 292: As seen in the subsample at 50 mm from the base of the column but with less frequent black flecks of microscopic ?ash/coal (score 1).

Subsample at 650 mm from base of Sample 16 (340 mm from base of Sample 16), Context 292: As seen in the subsample at 550 mm from the base of the column.

Subsample at 750 mm from base of Sample 16 (440 mm from base of Sample 16), Context 292: As seen in the subsample at 550 mm from the base of the column.

Subsample at 830 mm from base of Sample 16 (520 mm from base of Sample 16), Context 292: Almost entirely inorganic, with the arrest trace of uncharred organic detritus (<1%) and a few black flecks of microscopic ?ash/coal (score 1). No interpretatively valuable microfossils were present.

Discussion and statement of potential

The bulk sediment sample from Context 250, secondary fill of late Romano-British (late 4th-early 5th century) pit [251] clearly contained a range of waste materials from human activity including food waste (animal bone and ?oyster shell; the former strongly represented within the corresponding hand-collected assemblage (and to a lesser degree within the primary fill, Context 252) and oyster shells were seen during excavation but noted to be '…too fragile to recover whole' – LS Archaeology pers. comm.), other domestic rubbish (i.e. pot sherds; a further 247 sherds were recovered by hand-collection), demolition debris (brick/tile fragments, ?mortar and two corroded iron ?nails), and a little industrial waste (metallic slag and hammerscale). The sample residue was dominated by large stones and, taken as a whole, this deposit appears to represent deliberate backfilling of the pit, with the finer silt component infilling over time. There was no evidence to suggest that this feature functioned as a cess pit.

The six other bulk sediment samples investigated and the column samples were all interrelated. Contexts 257 (Column Sample 17) and 292 (Column Samples 14, 15, 16 and 18; Bulk Sample 23) were equivalent undated, layered, natural (?alluvial) deposits. Context 258 (Bulk Sample 24) was the ?Romano-British infill of a ?natural depression or inclusion within Context 257 and Contexts 267, 268 and 286 (Bulk Samples 19, 20 and 22, respectively – latest to earliest) were a series of Romano-British (or ?Romano-British) ?dump deposits within Context 292, with Context 287 (Bulk Sample 21) an intervening layer of re-deposited sand between Contexts 286 and 267.

Investigation of the column samples through the undated ?alluvial deposits, Contexts 257 and 292, provided little additional information. Interpretatively valuable microfossils (e.g. diatoms which could provide information regarding deposition or pollen which could indicate habitats in the local environment and wider landscape) were entirely absent from the subsamples examined; only occasional fragments of fungal hyphae were noted. Two principal mineral components were consistently recorded, a light yellow/yellow-brown (occasionally light/mid brown or grey-brown) fine sand and a light/mid to mid grey-brown fine sandy silt/silty fine sand. In the main (and where preserved within the column samples – which was not the case for the upper part of Context 292 (Column Sample 18) and variable for Context 257 (Column Sample 17)), layers of the two mineral components were discrete, linear and angled approximately 10 degrees from horizontal.

They appear to represent repeated episodes of low-energy (subjectively slightly higher for the sandy silt/silty fine sand layers as these appeared to contain coarser mineral grains as well as finer ones than seen in the fine sand layers), presumably aquatic (although supporting evidence for this was unfortunately lacking), deposition (perhaps at the limits of flooding), with the slight skew from the horizontal suggesting the sediments to be following the orientation of a pre-existing surface. The exception to this was the part of Context 292 represented in Column Sample 16 between 334 and 420 mm from the base which comprised the same components but had a rather 'swirled' appearance as if disturbed by a subsequent higher energy inwash or deposited in a backwash against an obstacle not previously or subsequently present.

There were no discernible inclusions or increases in particle size to suggest the former nor evidence within the column sample to suggest the latter, but attempts at ground-consolidation could perhaps have resulted in a backwash environment (see discussion of evidence from the bulk samples regarding ?dump deposits – below). Both mineral components typically included small to moderate amounts of microscopic ?ash/coal and there were also discrete

small ‘lenses’/patches of similar material at 161-165 mm and 824-828 mm from the base and thin bands at between 242 mm and 245 mm and 334 mm and 420 mm from the base of the column sample through Context 292 (the last sinuous and marking the upper boundary of the part of the deposit with a rather ‘swirled’ appearance). It was not possible to determine if this material derived from human activity (fuel waste) or simply reflected a minor naturally occurring component eroded from the drift (superficial deposits) of the local (or upstream) geology, however. Overall, it seems most likely (on the current evidence) that the equivalent Contexts 257 and 292 represent flood deposits (at the limits of the flooding) dating to the Romano-British period but an earlier date (the possibility of a peri-glacial origin has been suggested) cannot be wholly excluded.

The bulk sediment sample from Context 292 contained no definitive artefactual remains – the washover fraction consisted largely of fine coal (to 4 mm) but this may have been naturally occurring (see above). The only biological material recovered was a single *Nebria* ?*brevicollis* (Fabricius) ground beetle which was almost certainly a modern contaminant of the sample. Most of the relatively small amount of material remaining after processing to 300 microns was sand with some black flecks of ?coal (consistent with the nature of the deposit as seen in the column sample), with occasional small stones (to 4 mm) and one much larger stone (to 100 mm). The presence of the last was rather incongruous and it seems likely that this (and perhaps also the smaller stones) have been introduced (see following paragraph).

The assemblages of remains recovered from the three (?)Romano-British ?dump deposits (Contexts 267, 268, 286) and the ?Romano-British infill of a ?natural depression within Context 257 (Context 258) were all very similar in character. All contained demolition debris (fragments of brick/tile and mortar), food waste (bone fragments from all four and marine shell from three – a little shell was also recovered from Context 268 but was indeterminate), and a little industrial waste (hammerscale and/or slag); there was also a little pottery from Contexts 258 and 268 which may provide firm dating for these deposits (two sherds of pottery were also recovered from Context 267 but this deposit has already been dated via the 32 sherds recovered on site).

Each also contained relatively large stones (maximum sizes ranging from 85 to 140 mm) and there is, therefore, the suggestion that these deposits may represent deliberate dumping of material to infill the ?natural depression and consolidate marginal land subject to repeated flooding (comparable to the apparent deliberate backfilling of pit [251] – see above). If this was the case, then it would seem that these efforts were unsuccessful given that Romano-British Context 267 (the uppermost of Contexts 267, 268 and 286) was “…fully encompassed within…” Context 292 (LS Archaeology pers. comm.). Context 287, the sand layer between Contexts 286 and 267, did indeed appear to be redeposited as pottery was recovered from it on site and, in support, two additional sherds were recovered from the bulk sediment sample, together with brick/tile fragments, bone and a corroded iron object (a ?nail/bolt).

The wood ‘spot’ sample of the base lining of 19th century drain [129] (fill Context 130) was unusual in being the only evidence of waterlogged preservation (albeit rather poor as the wood was quite decayed). All five of its larger fragments, originally parts of a single ‘plank’, were independently identified as a ring-porous wood species and probably oak (cf. *Quercus*) – a durable wood which has been employed for a variety of construction purposes since antiquity. Context 130 was described as a ‘sticky clay silt’ fill and it seems that the feature has held ground water sufficiently to create localised anoxic waterlogged conditions and allow these to persist at least to some degree.

No material suitable for submission for radiocarbon dating was seen or recovered. The very limited quantities of charcoal were all of unknown wood age and the associated ‘old wood’ problems could result in a radiocarbon date significantly earlier (by an unknown amount but potentially several hundreds of years in the case of long-lived species such as oak) than the charring event being returned. The same problems would apply to the wood recovered from

Context 130 – particularly as here all the fragments were probably oak – but this material has already been confirmed as part of the lining of a 19th century drain. Bone recovered from the bulk sediment samples was typically small fragments and highly unlikely to be successfully radiocarbon dated – more complete bones from within the hand-collected assemblage (reported elsewhere) *may* be suitable, however.

Recommendations

No further study of the biological remains reported here is warranted.

Retention and disposal

All of the extant material should be retained, for the present at least, pending a decision regarding any further investigation to be undertaken (the application of alternate dating techniques to the ?alluvial deposits, Contexts 257 and 292, for example).

Archive

All of the extant material is currently stored by Palaeoecology Research Services (Unit 4, National Industrial Estate, Bontoft Avenue, Kingston upon Hull), pending return to the archaeological contractor (or permission to discard), along with paper and electronic records pertaining to the work described here.

Acknowledgements

The authors are grateful to grateful to Donna and Luigi Signorelli, of LS Archaeology, for providing the material and the supporting information.

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LITHICS

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YAT Project No. 6139

4TH June 2019

Introduction

This assessment relates to n=6 lithics recovered from the archaeological excavation at Hudson House, excavated by LS Archaeology (LS Archaeology project code HHY18). The excavation produced n=6 pieces of flint, n=2 of these were humanely struck flint, with n=4 natural pieces.

The majority of the contexts related to 19th Century railway and a small number of Romano-British features. The flint is therefore likely to be residual, either disturbed during 19th Century construction or else transported within material used for the railway construction. It is also possible that some of the natural flint was transported by fluvial and glacial action.

The humanly struck flint consisted of a scraper/combination tool and a flake. These are likely of a Late Neolithic date.

The assemblage was recorded using standardised methods detailed below.

METHODOLOGY

A rapid assessment of the lithics was undertaken. This involved the identification of attributes of humanely struck flint. These include the presence of a striking platform, bulb of percussion, a dorsal and ventral face, conchoidal fracture ripples and secondary retouch (Andrefsky 2005).

The lithics were individually recorded onto an Excel spreadsheet to be deposited within the site archive. A summary of the lithics type and raw material by context is presented in Table 1.

2.1 Raw material

For the raw material types and attributes I have followed the groups set out by Conneller (1999) & Preston (2011). Raw material attributes were based upon the methodology used by Conneller (1999). For each piece raw material translucency, texture, lustre and inclusions were recorded.

2.2 Typology

In analysing the typological and technological characteristics of the lithic material I have followed definitions outlined by Preston (2011) & Butler (2005). Cortex groups are based on definitions provided by Andrefsky (2005)

2.3 Technology

For each piece information was recorded on blank type, blank integrity, tool type, tool integrity, dimensions, dorsal scar pattern, cortex type, termination type, platform type, hammer type, use wear and raw material attributes

Results

Find No	Context	Type	L (mm)	W (mm)	D (mm)	Raw material	Dating
1	42	natural	20	19	7	Wolds flint	
2	252	natural	20	17	12	Till flint/speckled flint	
3	255	Side scraper/combination tool	72	70	18	Till flint/speckled flint	Late Neolithic
4	267	natural	24	20	11	Wolds flint	
5	267	natural	18	11	6	Wolds flint	
6	369	flake	35	26	12	Till flint/speckled flint	Late Neolithic/BA

Table 3. Lithics by form in relation to period

Discussion

The underlying geology of York does not produce naturally occurring flint. Therefore any present within the site must have been transported to the site by human activity or through secondary natural processes such as fluvial or glacial. There are two raw material types represented within the assemblage for Hudson House. Till or Speckled flint which has its origins along the north east coast of England, and Wolds flint found in the chalk of the Yorkshire Wolds (Henson 1985).

Finds No 1, 4 and 5 were natural pieces of Wolds's flint that did not exhibit the properties of humanely struck flint. The flint is quite abraded and this would suggest that it has been transported within a secondary context, either relating to the construction of the 19th Century Railway or through fluvial action. A better understanding of which process accounts for these natural pieces may be gained through the phasing of the site.

Finds No 2 is in a fresher condition than the other natural pieces suggesting that the piece had not been rolled during transportation, as in a fluvial environment. It is possible that small amounts of Till /Speckled flint are present within the glacial moraine as glacial erratics, having been transported from the east.

The side scraper/combination tool (Find No3) and flake (Find No 6) indicate Late Neolithic activity within the locality of the site. This is perhaps unsurprising as the site is located upon the York Glacial Moraine (BGS), an area of high ground that appears to have been a focus for prehistoric activity within York (Radley 1974). The small number of finds from secondary contexts indicates that any prehistoric activity has been removed by the 19th Century construction of the Railway station.

recommendations for retention/discard

It is recommended that the natural pieces be discarded. The side scraper and flake should be retained as they may be useful for a wider study of findspots within the York area.

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BUILDING MATERIALS ASSESSMENT

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24/09/19

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INTRODUCTION

This assessment relates to the ceramic building material (CBM), architectural fragments, stone and a number of other building materials (asbestos, *opus signinum*, mortar and plaster) recovered from the archaeological excavations at Hudson House, York (Client Site code HHY18; YAT project code 6136). The material ranged in date from Roman to 20th century. The majority of the material examined was linked to context numbers, though a smaller quantity was labelled by Trench or Test Pit number. The assessment is primarily to identify/date the items examined and at this stage the results have not been linked to the site phasing.

CERAMIC BUILDING MATERIAL

A total of 212.404kg of CBM was recorded, the various forms present are summarised by historical period on Table 1, while a summary of the forms present in relation to context is given on Table 2. Three contexts produced large volumes of CBM: T32 produced 44.195kg representing 20.8% of the total volume, which ranged from Roman to 19th century in date; Context 46 produced 22.47Kg representing 10.6% of the total volume, which was of Roman to 17th century date; Context 250 produced 16.240kg representing 7.2% of the total volume, which was of Roman date.

Methodology

The collection was recorded to a standard YAT methodology (McComish 2017) whereby each sherd is individually recorded on a pro-forma sheet which details the project code, the context number, the weight in grams, the fabric type, the surviving complete dimensions (length, breadth, thickness, flange height) and any other relevant information (surface marks, glazes, unusual features etc.). A question mark is placed after the form name if the identification is uncertain, for example 'Imbrex?', while the form of non-standardised sherds is listed as 'Other'. The fabric is determined by comparing the sherd to a York fabric reference collection held by York Archaeological Trust (YAT). The data is on an excel table stored at YAT under the project code 6136; this table has been given to LS Archaeology for inclusion in the site archive.

Results

Roman

The site was severely truncated by the construction of the Old Railway Station, and further damaged by the construction of Hudson House, despite this a reasonable quantity of Roman material was recovered. The presence of Roman sherds at the site is to be expected given the location of the site in what was clearly a high-status portion of the c*olonia*, with both a large bath complex and high-status building with mosaic flooring being located in the immediate vicinity of the present site. The Roman CBM accounted for 14.46% of the total volume of CBM from the

site. The forms present included roof tiles (tegulae and imbrices), tesserae and box flue, but the majority of the sherds were too fragmentary to determine the original form, such sherds are termed Roman brick.

Roman tiles and bricks were made using sanded moulds on a sanded workbench and consequently the sides and basal surfaces are coated with fine sand. If a tile stuck to the workbench a wire (similar to a cheese-wire) would be used to separate the tile from the bench, resulting in parallel lines on the base of the tile. Such lines were seen on three sherds of tegulae and one sherd of Roman brick from the present site. The upper surfaces of tegulae an imbrices were smoothed after moulding to increase surface tension, thereby making the tiles more water resistant. Following moulding all tiles were dried to a leather hard stage before being fired.

Tegulae are flat rectangular tiles with a flange along the upper surface of each longer side, and they were laid in columns on a roof. During manufacture, the thumb and side of the hand between the thumb and index finger were often run along the flange to smooth it while the tile was still in the mould, resulting in pronounced grooves drawn by the thumb adjacent to the flange. Tegulae have an upper cut-away on the upper surface of the flange at the top end of the tile, and a lower cut-away on the basal surface of the lower end of the flange. The cut-aways were designed to interlock so that adjacent tegulae would lie flat when placed on the roof. Upper cut-aways were knife cut. Lower cut-aways could be made either by having a specifically shaped block within the mould, or by cutting with a knife.

The tegulae at the present site ranged in thickness from 18-39mm (17 examples) with flanges 28-46mm thick (8 examples). No complete lengths or breadths survived. Smoothing lines were present on the upper surface of one tegula. Grooves by the flange were observed on five tegulae. No upper cut-aways were present, but there were three knife-cut lower cut-aways. Cut-aways can vary in form and the examples from this site were in shape B6 (following the classification by Warry 2006, 61). This type is one of the most commonly occurring shapes within York (McComish 2012, 83); the present site therefore conforms to the pattern seen for York as a whole.

Imbrices were laid on a suitably shaped former following moulding, to create a half cylindrical tile which tapered slightly in width from bottom to top. Imbrices these were laid over the joints between the columns of tegulae and mortared into place, with the narrow end of one imbrex slotting beneath the wider end of the imbrex above.

The imbrices at the present site ranged in thickness from 16-23mm (38 examples). No complete lengths or breadths survived. Smoothing lines parallel to the long edge of the tile were present on 11 of the imbrices.

Box flues were rectangular cross-sectioned tubes which usually had two opposing plain sides with cut out vents, and the remaining two sides were keyed externally. Box flues were laid in vertical stacks lining the walls of heated rooms (those with hypocaust systems). The keyed sides adhered to mortar lining the walls of the room on one side, and were faced with mortar on the interior elevation. The vents of adjacent stacks abutted one another enabling hot air to flow up from the hypocaust and through the walls, maximising the heat obtained.

At the present site the box flues were 15-21mm in thickness (20 examples), but no other dimensions survived. Eight of the sherds were from keyed sides and 15 were from plain sides. Part of a rectangular vent was present, but this was insufficiently preserved to determine the dimensions. All the keyed examples were combed, six were combed in one direction, while two sherds were combed on two opposing diagonals. Thirteen of the sherds had sooted interiors relating to their use. The box flues may have originated from a large Roman bath complex located to the immediate north-east of the Hudson House site.

Two tesserae were present which ranged from 26 x 23 x 16-26 x 18-23mm in size and a third which was 16 x 13 x 9mm in size. The sizes suggest that the first two would have been from a tessellated pavement and the third from a mosaic.

There was one additional sherd that was 10 x 50 x 21mm in size which may have been a tessera, but if so it is unusually long, alternatively this could have been from an *opus sectile* pavement. The tesserae could have originated from either the large Roman bath complex located to the immediate north-east of the Hudson House site, or from a high-status building with a mosaic floor located to the immediate south-east of Hudson House.

Roman bricks were made in a series of standardised sizes based on a Roman foot; from smallest to largest these were bessales, pedales, Lydions, sesquipedales and bipedales. The material recovered from the present site was too fragmented to determine which type of bricks were present. The only features of note on these brick sherds were that one sherd was pierced by a circular hole; such holes are occasionally found on Roman bricks and on some tegulae, which may suggest that the sherd in question originated from a tegula. Three sherds had smoothing lines on the upper bed.

Two brick sherds had signature marks in the form of a single arc, though neither was sufficiently well-preserved to determine the overall design. Signature marks were drawn while the tile was still wet, usually using the fingers, and they are in the form of simple shapes. The function of these marks is unclear; it has been suggested that they could represent trade-marks, or that they were designed to denote grades of differing quality tile, or that they were designed to indicate which tiles were to be stamped by the overseer (Brodribb 1989, 104; McWhirr and Viner 1978, 364). One sherd had a partial dog's paw print; these are commonly seen on tiles and resulted from animals walking across the tiles while they were laid on the ground to dry prior to firing.

Two of the imbrices and 18 of the Roman bricks had reduced cores, caused by the exclusion of oxygen during part of the firing process. One Roman brick was underfired, one was vitrified from overfiring and one was a waster from overfiring. Three of the bricks were sooted as a result of use, while a further six were abraded.

The Roman CBM was typical for York as a whole in terms of the forms, fabrics and dimensions present. The box flue tiles clearly originated from a hypocaust system, and the most likely candidate for their point of origin is the nearby baths complex, though it is also possible that the high-status building to the south-east of the site may have had its own private bath house. The tesserae are from a tessellated pavement which, though of less elaboration than a mosaic floor, still represented a considerable investment of resources. These could have originated form flooring associated with either of the buildings mentioned above. The presence of a single rectangular shaped tessera raises the intriguing possibility that an *opus sectile* pavement was present in the vicinity, though it could equally represent a larger than average tessera from a tessellated pavement.

Medieval

Medieval CBM accounted for 25.63% of the total volume of CBM from the site. The forms present included roofing tiles of 13-16th century date (peg and plain), plain glazed floor tile of 14-16th century date and bricks of 14-16th century date. Medieval tiles were made using a similar process to the Roman tiles, i.e. sanded moulds on a sanded workbench, followed by smoothing, then drying to a leather hard stage and finally firing.

Later medieval roofing tiles were flat rectangles which could be fixed to the roof either by a projecting nib which hooked over the laths of the roof (nib tiles) or by a wooden peg or nail (peg tiles). Where the method of fixing is unclear due to the fragmentary nature of the material in question the tiles are termed plain tiles. All of these roofing tiles were laid in overlapping courses on a roof (as with present day roofs).

The peg tiles examined ranged from 12-18mm in thickness (24 examples), but no complete lengths or breadths survived. In the case of York peg-holes were usually square in shape, but circular and diamond shapes are also common. The present site had 9 square peg-holes, 12 circular peg-holes and 3 rectangular shaped peg-holes, the dominance of circular holes is slightly unusual for York, though the number of examples at the present site is relatively small. The peg-holes were 9-15mm in size, which is typical for the period. Occasionally the handle of the hole-punch leaves an impression around the peg-hole, and this was visible on one sherd from the present site. Smoothing lines parallel to the edge of the tile were present on three examples. One of the peg tile sherds was overfired and slightly warped.

The plain tiles examined ranged from 11-22mm in thickness (392 examples), conforming to the sizes previously recorded for York (Betts 1985, 459), but no lengths or breadths survived. Smoothing lines parallel to the edge of the tile were present on 109 examples, while one example had finger drawn smoothing lines. In some cases, following removal from the mould the edges of the tile would be tamped down using the side of the mould, resulting in indented borders (2 examples). One sherd had rain-marks on the upper surface, resultant from being laid on the ground to dry prior to firing. Thirty-five of the plain tile sherds had reduced cores, and four sherds were overfired, one of which was warped, two blown and one vitrified. Two sherds had a sooted back resultant from use, while a further 18 sherds had sooted breaks indicative of re-use.

Medieval floor tiles have knife cut edges, which taper from top to base, so that the tiles could be laid edge to edge with no mortar visible (as opposed to the modern preference for clear lines of grouting to be visible between tiles). One sherd of 14-16th century plain glazed floor tile, with a green glazed upper surface, was present at the site (Stopford 2005, 213). Floors made of such tiles were usually of two colours laid in a chequerboard pattern, the colours being cream and dark green or brown/black. Glazed floor tiles were usually associated with religious buildings, though very occasionally there were secular buildings with such floors. The most likely point of origin for this tile is a Dominican Friary, which originally extended over the north-easternmost portion of the Hudson House site.

Five sherds of medieval bricks were present which range from 42-51mm in thickness (5 examples), one breadth survived at 110mm, but no lengths survived. The surviving breadth is slightly narrower (by 4mm) than the range recorded for York by Betts (1985, 451) Medieval bricks were made in sanded moulds resulting in a sanded base and edges. The coarseness of the sand used could vary from fine (three examples), to coarse (one example). A further 20 sherds were tentatively identified as medieval brick, though the lack of surviving original edges meant these identifications were uncertain, the sherds in question could equally represent post- medieval bricks.

The medieval CBM was largely typical for York as a whole in terms of dimensions, with the exception of one slightly narrower brick. Though all of the fabrics seen had been recorded in York before, this site is unusual in that the most commonly occurring roof tile fabric was M11 (within York as a whole the most commonly occurring fabrics are typically M1-M4). This may suggest that much of the tile originated from a building with a tiled roof sourced from a single manufacturer; an obvious candidate would be one of the buildings of the Dominican Friary. The relative lack of medieval brick sherds may suggest that relatively few buildings in the area were constructed of brick; brick was not an especially common building material in the medieval period, often being confined to hearths/chimneys due to its' fireproof qualities.

Post-medieval

The post-medieval CBM accounted for 8.65% of the total volume of CBM from the site. The forms present included bricks of 16-18th century date and pan tiles of 17th century and later date. Pan tiles continue in use to the present day; the recorded sherds could therefore be of any date from the post-medieval period onwards.

The post-medieval bricks were 43-60mm in thickness (20 examples), 103-115mm in breadth (10 examples) and 221m in length (one example). Bricks of this date were made in wetted moulds, a technique termed slop-moulding (24 examples). Six of the bricks have a turning mark on the base, which is a common feature on post-medieval bricks in York.

Pan tiles have a shallow S shaped profile and a nib on the reverse for attaching the tile to the laths of a roof. These tiles were introduced into eastern Britain from the Netherlands in the 17th century and came into widespread use (Van Lemmen 2013, 8). The examples at the site were 13-17mm in thickness (13 examples), but no lengths or breadths survived. The single surviving nib was 53x23x25mm in size.

The post-medieval CBM was typical for York in terms of the forms, fabrics and dimensions seen..

Mid 18th to 19th century

The mid-18th to 19th century CBM accounted for 51.27% of the total volume of CBM from the site. The forms present included hand-made bricks of mid-18th to mid-19th century date, machine-made bricks of early 19th century or later date, and a variety of machine-made drains, ducts, sewer pipes and wall tiles all dating to the mid-19th century or later.

The mid-18th to mid-19th bricks were made in the same way as post-medieval bricks, i.e. slop moulding, but they were larger. This was as a response to the Brick Taxes of 1784-1850 which were initially levied per 1000 bricks, encouraging an increase in brick size to avoid the tax (Brunskill 1997, 38). In 1803 as a response to the increased size of bricks the tax was altered to be double duty on bricks more than 150cu inches in volume, which curbed the growth in the size of bricks (ibid., 38). The examples from the present site were 220-250mm long (23 examples), 105-120mm wide (31 examples) and 57-82mm thick (36 examples). Two had turning marks on the base. Two had reduced cores and one was sooted. A single example was shaped to act as a voussoir tapering along the length.

Mechanisation of the brick making process from the early 19th century onwards saw a vast increase in production. Machines for the mass production of pressed bricks were invented in the mid-19th century (Brunskill 1997, 25). Such bricks could have frogs (indentations)in one or both beds which made the central portion of the brick thinner; this reduced the volume of clay required for manufacture, reduced firing times and made the bricks lighter which was of great benefit to bricklayers (ibid., 25). Pressed bricks could be perforated, again to reduce the volume of clay needed for manufacture and to reduce firing times. Bricks could also be pressed several times to achieve the required density. Machine-made bricks often bear a manufacturer's stamp.

The machine pressed bricks from the site ranged from 57-78mm in thickness (6 examples), 110- 128mm in breadth (5 examples) and 220-234mm in length (4 examples). One partial sherd was of unusual length being over 275mm long. Two of the bricks had a frog on one bed. Two identical bricks had frogs on both beds, of which one frog was stamped CASTLEFORD C. This relates to the Castleford Brick Company which was in production from 1897-1912 (Old Bricks website). These bricks were from Context 2. One brick was pierced by three firing holes 22mm, in diameter and 20mm apart. Two of the sherds, though not stamped, were in fabrics typical of the London Brick Company, which began in

1900 and was at one stage the largest brickworks in the world, producing 500million bricks a year at its peak (Bedfordshire Borough Council). These sherds were in Context 144 and T32.

There were also two sherds of firebrick. These were manufactured using fireclay which is often found in association with coal deposits. Fireclay has a high proportion of alumina and is free of lime, magnesia and metallic oxides (Brunskill 1979, 42). Such bricks were used in industrial buildings where resistance to heat was required such as furnaces, kilns or factory chimneys. The examples of firebricks from the present site were 67mm and 70mm thick, and 111mm and 113mm wide, no lengths survived. No stamps were present to indicate the manufacturers concerned.

The industrial revolution led to a vast increase in the use of machine-made ceramics for a wide range of purposes. The present site yielded three examples of unglazed drains which ranged 16- 17mm thick (no other dimensions survived). In addition, there were three sherds of salt-glazed sewer pipes which ranged in size from 12-17mm thick (no other dimensions survived). One cap to cover an electricity cable was present which was stamped with the makers mark BALDWIN.

Three sherds of plain dark red Machine-made wall tiles dating to the early-19th century or later were present, all of which were 11mm thick. There was a fourth wall tile with a floral design in yellow green and brown on the upper surface and part of a makers' stamp 'STOKE ON' on the reverse, presumably this tile originated from Stoke-on-Trent.

The 19th century and later CBM was in fabrics typical for York as a whole, the dimensions were also typical with the exception of the unusually long brick.

Summary and Recommendations for further work

The collection of CBM from the site was for the most part typical for the periods in question in terms of the forms, fabrics and dimensions present, but it is of interest for the information it can contribute to the overall picture of the area in the Roman period, the period of the Dominican Friary and the construction of the Old Railway.

It is recommended that the retained fragments are properly dried prior to long term storage (as some items were still damp at the time of the assessment), some could also be re-bagged in smaller bags so as to decrease the volume of packaging.

If a publication is envisaged for this site, the CBM assessment text could be adapted to form a publication report. In this case the data would need to be related to the site phasing, highlighting some specific contexts, such as Context 250, which yielded abundant CBM. .

Any illustrations to accompany such a text could be done through the use of photographic images rather than by hand-drawn illustrations, as this would reduce costs. Photographs could be taken of:

The group of tesserae

The group of flue tiles

One of the tegulae

The floor tile

None of the material was worthy of museum display.

Retention/Discard

For excavations within the City of York, YAT routinely adopts a record and discard policy, whereby only a representative selection of CBM from each site is retained. In the case of this site the bulk of the CBM was either too fragmented to merit retention or was typical for York as a whole. In the light of this, just 25 sherds were retained.

Table 1. CBM by form in relation to period

Period	Form	No. of sherds	Weight in grams	% of total weight
Roman	Brick	21102	354	9.93
	Flue	1805	23	0.85
	Imbrex	3375	47	1.59
	Tegula	4365	26	2.06
	Tessera	65	4	0.03
Medieval	Brick	6570	26	3.09
	Peg	3440	24	1.62
	Plain	44370	396	20.89
	Plain glazed floor	50	1	0.02
Post-medieval	Brick	17292	31	8.14
	Pan	1075	13	0.51
Mid 18th and later	Brick	105890	58	49.85
	Drain	300	3	0.14
	Duct	2200	1	1.04
	Floor	255	4	0.12
	Sewer	250	3	0.12

Table 2. CBM in relation to context

Context	Dating	Forms present
2	Mid 19th+	Brick
3	Mid 19th+	Floor, Post medieval brick
4	Mid 19th+	Pan, Peg, Plain, Sewer, Tegula
5	Mid 19th+	Drain, Floor, Pan, Plain, Sewer
7	17th+	Pan, Post-medieval brick
9	Mid-18th to mid-19th	Brick, Pan, Plain
10	Mid-18th to mid-19th	Brick, Plain
11	Mid 19th+	Brick, Roman brick
12	Mid 19th+	Brick, Medieval brick
26	Mid 19th+	Brick
42	14-16th?	Medieval brick?
46	17th+	Brick?, Medieval brick, Pan, Peg, Plain, Post-medieval brick, Roman brick
49	Mid-18th to mid-19th	Brick
53	Mid-18th to mid-19th	Brick
68	Mid-18th to mid-19th	Brick
74	Mid-18th to mid-19th	Brick
77	Mid-18th to mid-19th	Brick
80	Mid-18th to mid-19th	Brick
83	Mid-18th to mid-19th	Brick
89	Mid-18th to mid-19th	Brick
99	Mid-18th to mid-19th	Brick
104	Mid-18th to mid-19th	Brick
108	Mid-18th to mid-19th	Brick
118	Mid-18th to mid-19th	Brick
128	Mid-18th to mid-19th	Brick
129	Mid-18th to mid-19th	Brick
144	Mid 19th+	Box flue, Brick, Plain
145	13-16th	Peg
200	Mid 19th+	Brick

Context	Dating	Forms present
221	Mid 19th+	Duct

Context	Dating	Forms present
229	Mid-18th to mid-19th	Brick, Post-medieval brick
244	Mid-18th to mid-19th	Brick
245	13-16th	Peg
249	Roman (+3 intrusive sherds)	Box flue, Brick, Post-medieval brick?, Roman brick,
250	Roman	Box flue, Imbrex, Roman brick, Tegula, Tessera
252	Roman (+1 intrusive sherds)	Imbrex, Post-medieval brick, Roman brick, Tegula, Tessera
258	Roman	Imbrex, Roman brick
261	Mid-18th to mid-19th	Brick
267	Roman	Box flue, Roman brick
268	Roman	Imbrex, Roman brick, Tegula?
279	Roman	Roman brick
286	Roman	Box flue, Roman brick
288	Mid-18th to mid-19th?	Brick?
291	14-16th?	Medieval brick?
321	Mid-18th to mid-19th	Brick
330	Mid-18th to mid-19th	Brick
343	13-16th	Plain
373	14-16th	Plain glazed floor, Plain, Roman brick
374	Roman	Imbrex, Roman brick
375	13-16th	Imbrex, Plain, Roman brick, Tegula
388	13-16th	Peg
392	16-18th	Box flue, Imbrex, Medieval brick, Post-medieval brick, Plain, Roman brick, Tegula
491	Mid 19th+	Brick
512	Mid-18th to mid-19th	Brick
T23	16-18th	Plain, Post-medieval brick, Roman brick
T29	13-16th	Peg, Plain,
T32	Mid 19th+	Brick, Medieval brick, Pan, Peg, Plain, Post-medieval brick, Roman brick, Tegula

Context	Dating	Forms present
Test Pit 1	13-16th	Plain

STONE BUILDING MATERIALS

This assessment relates to a variety of stone items recovered from Hudson House, York, including stone roofing tile, fragments that probably originated from stone roofing and flooring tile, architectural fragments, samples of stone from architectural fragments which were not removed from the excavations due to their size and a number of smaller stone items. The majority of the material examined was linked to context numbers, though a smaller quantity was labelled by Trench number.

Stone roofing and flooring

A total of 333.5kg of stone roofing and flooring fragments were examined, which ranged from Roman to 19th century in date. The forms present included tesserae, stone roof flagstones, slates and a sett, together with abundant stone fragments which probably originated from stone roof tiles. The forms are summarised on Table 3, while Table 4 lists the forms present in relation to context.

Table 3. Stone tiles by form

Form	No. of frags.	Weight in grams	% of total weight
Tessera	5	60	0.2
Stone roof tile	266	27920	83.7
Stone floor tile	3	700	2.1
Slate	11	1020	3.1
Setts	1	33350	10.9

Methodology

The stone roof and floor flags are recorded to a standard YAT methodology (McComish 2017) whereby each sherd is individually recorded on a pro-forma sheet which details the project code, the context number, the weight in grams, the stone type, the surviving complete dimensions (length, width, thickness) and any other relevant information (e.g. peg-hole size). A question mark is placed after the form name if the identification is uncertain, for example 'stone peg?'. It should be noted that the term 'stone peg' is used for all roofing slabs of limestone and sandstone, while the term 'slate' is only used for roofing items of metamorphic rock. The data is on an excel table stored at YAT under the project code 6136; this table has been given to LS Archaeology for inclusion in the site archive.

Results

Five Roman tesserae were present, which ranged from 29 x 23 x 8mm to 32 x 29 x 16mm in size, four were of micaceous sandstone and one of magnesian limestone. These would have been from tessellated pavements (mosaic tesserae are smaller, typically around 10 x 10mm in area). The presence of such items should be expected given that Hudson House lies adjacent to a major Roman bath house and a high-status building with a mosaic floor, either of which could have housed a tessellated floor.

A total of 238 fragments of micaceous sandstone were present which ranged from 5mm to 29mm in thickness, suggesting that they probably originated from roofing flags, though no peg holes survived. Much of this material, 55% of the total volume of roof and floor slabs, came from Context 250 (which was dated by the CBM as Roman). Micaceous sandstone roof flags were widely used in Roman York, being sourced from the Elland area near Leeds (Buckland 1976, 36). The use of this stone for roofing became increasingly common in York from the late 2nd century onwards (McComish 2012, 256-8), and some idea of the scale of production is indicated by the widespread nature of such finds, with roofing flags of this type being recovered from Roman sites at Rudston and Harpham in East Yorkshire, and Hibaldstow in North Lincolnshire (Buckland 1978, 41).

There was one fragment of micaceous sandstone 32mm thick, which could have been a floor or roof flag. This is also of Roman date, having been recovered from Context 252 which was dated by the CBM to the Roman period.

One fragment of an oolitic limestone roof flag was present, which was 13mm thick with a peg hole 6mm in diameter. In addition, there were a further 20 fragments of oolitic limestone present in thicknesses suggestive of roof flag (13-22mm thick). The fragments came from Contexts 250, 252, 267 and 268, all of which were dated by the CBM as Roman. Oolitic limestone is known to have been used for building purposes within Roman York, being sourced from the Howardian Hills to the east (Buckland 1976, 36-7).

Seven fragments of magnesian limestone were present. Five of these were in thicknesses suggestive of roof flag (11-20mm thick), while one was possibly a floor flag being 49mm thick. Magnesian limestone was widely used during both the Roman and medieval periods in York, making it difficult to suggest a date for the fragments concerned on the basis of their geology. Six of the fragments were clearly Roman as they were recovered from Contexts 249, 250, 252 and 258 all of which were dated as Roman by the CBM. The remaining fragment was from Context 7, a 17th century or later context, but it could represent residual material.

One fragment of coarse-grained sandstone (Millstone Grit) was present which, at 49mm thick, could have originated from a floor flag, though equally it could represent a small fragment of building material. Millstone Grit was widely used in Roman York for coffins and monumental works being very strong in both compression and tension, but it was also used in the Norman period (Buckland 1976, 33). Given that this fragment is from Context 250, which was dated as Roman by the CBM, it is clearly of Roman date.

One fragment of fine-grained sandstone 20mm thick probably represents a roof flag. This was of Roman date being recovered from Context 249, which was dated by the CBM as Roman.

Nine fragments of Welsh roof slate dating to the 19th century or later were present. These ranged in thickness from 3-9mm (no other dimensions survived). An additional two fragments of pale grey roof slate were present, the source of which is unknown, though they were clearly not from North Wales. These two slates were 6mm thick (no other dimensions survived) and one was pierced by a nail hole 6mm in diameter.

A stone sett of Victorian or later date was present (Context 4); setts were usually of granite and provided an exceptionally durable surface.

Table 4. Stone tiles in relation to context

Context	Dating	Forms present
4	Mid 19th +	Slate, Sett
7	Roman?	Stone peg?
42	Roman	Stone peg?
46	Roman	Stone peg?
245	Roman?	Stone peg?
249	Roman	Stone peg, Stone peg?
250	Roman	Stone floor?, Stone peg?, Tessera
252	Roman	Stone floor?, Stone peg?
258	Mid 19th +	Slate, Stone peg?
267	Roman	Stone peg, Stone peg?
268	Roman	Stone peg?
364	Roman	Stone peg?
375	Mid 19th +	Slate
392	Roman	Stone peg?
413	Mid 19th +	Slate
T3	Roman	Tessera
T32	Roman	Stone peg?

Architectural fragments (AFs) removed from site for examination

Eight architectural fragments were removed from site and assessed. Details of the various AFs are given in Table 5 below. The collection was of very poor quality and it was only possible to determine the date of three items and the original form of one item.

Methodology

The collection was recorded to a standard York Archaeological Trust (YAT) methodology (McComish 2015) whereby the fragments are numbered in a sequence for the site, starting at

1. The numbered AFs are recorded on individual pro-forma record sheets which detail the project code, the context number, AF number, the stone type, a simple keyword identifying the form (such as jamb or voussoir), the surviving dimensions (height, width and thickness), a free text description, a sketch (with any relevant measurements noted on the sketch) and any other relevant information. Rubbings of tool marks or 1:1 tracings of the profile are taken where necessary. The paper records have been returned to LS Archaeology for deposition with the site archive.

Results

Table 5 Architectural fragment catalogue

AF no.	Context	Dating	Forms present
1	45	Medieval	Small fragment of magnesian limestone column shaft. 110x100x80mm in size. One original dressed surface surviving (F1) all other surfaces broken off. No clear tooling survives. Too small to merit retention. (Labelled as 'Sandstone rubble to NE edge')
2	4	Unknown	Small fragment of coarse-grained sandstone, three original faces survive (F1-3), the remaining sides broken off. F1-3 from three adjoining sides of a rectangular block. The AF was 70x75x24mm in size. Probably from a wall facing stone originally.
3	4	Unknown	Small fragment of coarse-grained sandstone, no original surfaces survive, all sides broken off. 145x130x90mm in size. Original function unclear.
4	6	Unknown	Fragment of magnesian limestone, two faces surviving (F1-2) forming the top and base of a flat rectangular block, sides broken. Upper surface worn. A capstone or floor slab originally.
5	4	Roman?	Fragment of coarse-grained sandstone, with three faces surviving (F1-3), the remaining sides broken off. F1-3 from three adjoining sides of a rectangular block. The AF was 160x314x310mm in size. Faint pecked tooling on F2 (the side). Somewhat worn and damaged. Probably a footing originally.
6	4	Unknown	Small fragment of coarse-grained sandstone, five original faces survive (F1-5), the remaining side broken off. F1-5 from a cuboid block. The AF was 185x395x280mm in size. All faces eroded smooth. Probably from a wall facing stone originally.
7	4	Unknown	Fragment of coarse-grained sandstone, with three faces surviving (F1-3), the remaining sides broken off. F1-3 from three adjoining sides of a rectangular block. The AF was 27x354x195mm in size. Probably a footing originally.
8	4	Roman	Oolitic limestone block, badly battered. Two original surfaces present (F1-2) at right angles to one another. F2 rebated, the rebate being 41mm deep. No clear tooling. The AF was 180x210x130mm in size. Original function unclear.

AF1 was clearly of medieval date and almost certainly originated from the Dominican Friary. The fragment was too small to merit retention, it was not even possible to determine if this was an attached or free column.

AFs 2-3 and 7 were of coarse-grained sandstone, as stone that was in use in both the Roman and Victorian periods. Given that the context from which they originated were clearly 19th century it seems likely that these fragments relate to the construction of the Old Station in the 19th century. A fourth coarse-grained sandstone block from this context (AF 5) had faint pecked tooling on one surface suggestive of a Roman date, and the degree of erosion on the surfaces of AF 6 was also suggestive of a Roman date, but this is very tentative.

AF 4 could be Roman or medieval.

AF 8 was probably of Roman date given its geology (oolitic limestone being used in Roman York but not in the medieval period when magnesian limestone dominated) and its poor condition.

Architectural fragments examined on site (AFs)

Some of the AFs seen during the excavations were exceptionally large and rather than remove such items from site for examination (which would have been logistically difficult) the present author made four visits to the excavations while they were in progress to suggest dates for the items excavated and to identify the various stone types. The site staff took notes during these visits and included the information given on the site context records, they also took photographic records of all these items. Any AFs that were clearly of Victorian date, or that were not sufficiently diagnostic to merit long term retention were left at the site. The following text summarises the items in question.

A total of fifteen Afs were assessed on site, which are catalogued below. Two (AFs 10-11) were of Millstone Grit and may represent Roman stonework though their original form is unclear. These could have originated from either the Roman baths to the north-east or the high-status building with a mosaic floor to the south-west of the site.

The presence of reeded surfaces on AFs 12-14, 17 and 20 suggest an 18th century or later date (Clifton –Taylor and Ireson 1983,108); given their size these clearly relate to a major structure which suggests they are from the Victorian railway as do Afs 21-23 all of which exhibited machine cutting/drilling. AF 9 was probably a flagstone from the Victorian station. The remaining blocks (AFs 15-16 and 18-19) were insufficiently diagnostic to suggest a function, but they were of identical sandstone to the items relating to the Victorian station, so are probably also of Victorian date.

In addition, there were a small number of stone structures at the site that were not recorded by the present author, thought they were recorded in detail by the excavation staff: HHY18 412 was a stone foundation for a brick wall (Context 399); HHY18 468 was a Victorian curb-stone; HHY18 469 and HHY18 470 were sandstone slabs, probably a flagstones of Victorian date; HHY18 471 a group of six sandstone blocks which possibly originated from the Victorian station though they had become displaced; HHY18 490 was a stone foundation for a brick wall (Context 489). The remaining structures at the site were all of concrete (clearly relating to the Victorian station of more recent structures at the site), brick, or brick and stone, all of which are dated as mid-19th century or later.

Catalogue of AFs observed on site

The Afs are listed in context order together with a selection of the on-site record photographs. In each case the description is followed by a suggested interpretation/date.

AF 9 - HHY18 399 (context 144) Sandstone cuboid block 1025x1022x150mm in size. Three original faces surviving (F1-2 = top and base, F3 = side) the other sides are broken off, as is part of the surface of F1. Probably Victorian sandstone flooring flagstone from 1840 railway.

Plate 1 HHY18 399. F1 and 3 (scale unit 1m)

AF 10 - HHY18 400 Millstone grit cuboid block 980x770x290 mm. Two original faces surviving (F1 = top or base, F2 side) the other sides are broken off. Badly battered and chipped. Traces of a socket on F2. Roughly dressed.

The geology and condition of the AF suggest a Roman date. Original function unknown.

Plate 2 HHY18 400 (scale unit 1m)

AF 11 - HHY18 401 Millstone grit block 530x260x200mm in size. Three original faces surviving (F1-2= top and base, F3 side) the other sides are broken off. Battered and chipped. Tools marks on F3 which is dressed using a punch and hammer.

The geology and tooling of the AF suggest a Roman date. Original function unknown.

Plate 3 HHY18 401. F1 (left image scale unit 0.1m) and F3 (right image scale unit 0.1m)

AF 12 - HHY18 402 – Coarse grained sandstone cuboid block 990x750x310mm. Five original surviving faces (F1-2 = top and base, F3-5 = sides) the other side is broken off, as if much of the arris between F3-4. F3 is the original elevation; all other surfaces would have been within the thickness of the wall originally. Upper surface F1 is roughly dressed over most of the surface, with diagonal tooling lines at the arris with F5 (the back of the block). There is a pronounced grove close to the arris with F3. Basal surface F2 roughly dressed with a shallow groove close to the arris with F3. F3 (original elevation) with faint reeding. F4-5 (short side and rear long side) with tooling lines diagonal to the base/top of the block on both diagonals.

A basal course for a wall in the Victorian station, the course above would have abutted the groove on F1.

Plate 4HHY18 402. F1 (left image scale unit 0.1m) and F2 (right image scale unit 15m) showing grooves close to arrises with F3 (F3 beneath scale)

AF 13 - HHY18 403 – Coarse grained sandstone cuboid block 770x770x290mm. Four original faces surviving (F1-2 = top and base, F3-4 = sides) the other sides are broken off. F1 has rebate at arrises with F3-4. F2 a chamfer at arris with F3. Both surfaces roughly dressed. F3-4 with reeding. Remains of a square socket on one broken edge.

The corner of a basal course for a wall in the Victorian station, the course above would have abutted the rebate on F1.

Plate 5HHY18 403. F3 (left image scale unit 0.1m) with reeding and F2 (right image scale unit 0.1m) with diagonal tooling

Plate 6 HHY18 403. F1 (left image scale unit 0.1m) showing rebate, F2 (central image scale unit 1m) showing chamfer, and socket on broken side (right image scale unit 0.1m)

AF 14 - HHY18 404 – Coarse grained sandstone block, rectangular in cross-section, triangular in plan, 370x360x70mm. Three original faces surviving (F1-2 = top and base, F3 side) the other sides are broken off. F3 is the original elevation; all other surfaces would have been within the thickness of the wall originally. F1 has a groove close to the arris with F3. F3 with reeding.

A basal course for a wall in the Victorian station, the course above would have abutted the groove on F1.

Plate 7HHY18 404. F1 (left image scale unit 0.1m), F2 (right image scale unit 0.1m)

AF 15 -HHY18 405 – Coarse grained sandstone block 380x310x300mm. Two original faces surviving (F1-2 = top and base) the other sides are broken off. No clear tooling.

Non-diagnostic, but probably from the Victorian station given the similarity of the stone-type and scale of the block with other Victorian AFs from the site.

Plate 8 HHY18 405 (scale unit 0.1m)

AF 16 - HHY18 406 - Coarse grained sandstone cuboid block 300x310x70mm. Four original faces surviving (F1-2 = sides, F3 = base, F4 = top) the other two sides are broken off, as is most of the surface of F4. F4 has a rough chamfer at the arrises with F1-2. No clear tooling marks observed. Sooted and scorched in part.

Non-diagnostic in terms of form. Probably relating to Victorian railway buildings.

Plate 9 HHY18 406. F3 (left image scale unit 0.1m) and F4 (right image scale unit 0.1m)

AF 17 - HHY18 407 - Coarse grained sandstone block 300x310x70mm rectangular in cross- section, triangular in plan. Three original faces surviving (F1-2 = top and base, F3 = elevation) the other sides are broken off. Rebate on F1 close to arris with F3. F1-2 roughly dressed. F3 with reeding and a vertical semi-circular vertical socket 90mm wide.

A basal course for a wall in the Victorian station, the course above would have abutted the rebate on F1. The function of the socket is unknown.

Plate 10 HHY18 407 (scale unit 0.1m)

AF 18 - HHY18 408 - Coarse grained sandstone cuboid block 330x310x260mm. One original face surviving (F1-2 = top and base, F3 = elevation) the other sides are broken off. F1 roughly dressed.

Non-diagnostic in terms of form. Probably relating to Victorian railway buildings given the geology.

Plate 11 HHY18 408 (scale unit 0.1m)

AF 19 - HHY18 409 - Coarse grained sandstone cuboid block 390x310x260mm. Three original surviving faces (F1-2 = top and base, F3 = side). No clear tooling.

Non-diagnostic in terms of form. Probably relating to Victorian railway buildings given the geology.

Plate 12 HHY18 409. F3 (left image scale unit 0.1m) and F1 (right image scale unit 0.1m)

AF 20 - HHY18 410 – Fine grained sandstone, with rare flecks of mica, cuboid block 450x430x110mm. Three original surviving faces (F1-2 = top and base, F3 = side). Reeding style tooling on F1. F2-3 plain dressed surfaces. Square socket on F1 (20x100x20mm). Black discolouration across stone.

Relating to the Victorian station, socket to support some form of superstructure.

Plate 13 HHY18 410. F1 (left image scale unit 0.1m) and F2 (right image scale unit 0.1m)

AF 21 - HHY18 411 – Fine grained sandstone, with rare flecks of mica, cuboid block 500x350x150mm. Four original surviving faces (F1-2 = top and base, F3-4 = front and back), both ends broken off. Surfaces machine cut. Square socket at edge of F1 (100x100x20mm). F2 with recess running full breadth of block 100x40mm in size. Mortar on F2 and F3.

Relating to the Victorian station, socket to support some form of superstructure. Basal recess presumably sat above some other feature.

Plate 14 HHY18 411. F1 and F3 (left image scale unit 0.1m) and F2 (right image scale unit 0.1m)

Plate 15 HHY18 411. F1 and F3 (left image scale unit 0.1m) and F2 (right image scale unit 0.1m)

AF 22 - HHY18 430 Coarse grained sandstone cuboid block 680x600x290mm. Five original faces surviving (F1-2 = top and base, F3-5 sides) the other side is broken off, as is part of the surface of F1. F1 has a rectangular socket

230x140x20mm in size within which are two machine drilled circular holes 40x40x150mm in size. Degraded wood within the holes suggest that this supported some form of vertical wooden beam. All surfaces roughly dressed.

Relating to the Victorian station, socket to support some form of superstructure

Plate 16 HHY18 430. F1 (scale unit 1m)

AF 23 - HHY18 431 Coarse grained sandstone cuboid block 580x600x320mm. Four original faces surviving (F1-2 = top and base, F3-4 sides) the other sides are broken off, as is part of the surface of F1. F1 has a rectangular socket 240x235x30mm in size within which are two machine drilled circular holes. All surfaces roughly dressed. Surface of stone appears black though this is more likely soil staining as sandstone shows no evidence of burning.

Relating to the Victorian station, socket to support some form of superstructure. Almost identical to HHY18 430.

Plate 17 HHY18 431. F2 (scale unit 1m)

Other building stone

There was a group of small fragments of stone which were too small to merit Af numbers; these are detailed below.

Methodology

This collection was recorded a pro-forma sheet detailing the project code, the context number, form, the weight in grams, the stone type, the surviving complete dimensions and any other relevant information (details of surviving surfaces etc.). Stone items where the form is uncertain are listed as 'unknown'. The data is on an excel table stored at YAT under the project code 6136, which has also been given to LS Archaeology for inclusion in the site archive.

Results

On examination a stone from Context 45 labelled 'sandstone rubble to NE edge, worked stone?' proved to be a quartzite cobble. Cobbles were frequently recovered from deposits around York for use as building materials from Roman times onwards, so this item is impossible to date.

Four small fragments of magnesian limestone were present, one of which had an eroded surface which may originally have been shaped, though this was unclear, and a second had one surviving flat dressed surface. The remaining two were small fragments. These could be of Roman or medieval date. These fragments were in Contexts 267, 348, 412 and T32.

Two small chips of coarse-grained sandstone were present in Contexts 3 and 250, the latter is certainly of Roman origin, while the date of the fragment in Context 3 is unclear (residual Roman or 19th century.

Two fragments of fine-grained sandstone from Context 46 were of 19th century or later date, as one had a reeded surface, which was a popular finish in the 19th century (Clifton Taylor and Ireson 1983, 110).

Four small fragments of marble were present in Context 42 and Test Pit 1 (two in each). While the examples from Context 46 were chips with no worked surfaces, those in Test Pit 1 were of 19th century date probably representing veneers or architectural detailing within the Old Railway Station. Marble is almost entirely absent in the British Isles and was usually imported from Italy (Clifton Taylor and Ireson 1983, 46).

A single bag contained a small fragment of jet or shale which was labelled as Context 375 'worked stone?'. The function of this item is unclear, but it could simply be a random fragment of unworked stone.

Summary and Recommendations for further work

The stone building materials have little potential for further research, as the roof tile is typical for York, while the remaining material is either undiagnostic or fragmentary.

It is recommended that the retained fragments of roof slate, marble etc. are properly dried prior to long term storage (as some items were still damp at the time of the assessment), these could also be re-bagged in smaller bags so as to decrease the volume of packaging.

It is recommended that the advice of a geologist is sought to determine the source of two slates of uncertain geological provenance.

The small fragment of jet/shale should be seen by N. Rogers to determine if it is worked or naturally occurring.

If a publication is envisaged for this site, the stone assessment text could be adapted to form a publication report, and the data would need to be related to the site phasing. Virtually none of this material is worthy of any form of illustration. If deemed necessary, the stone fragment with reeding and two of the small marble fragments could be recorded photographically for inclusion in this report.

None of the material is worthy of museum display.

Retention/Discard

Virtually all of the roof flags were discarded with the exception of two slates of uncertain geological provenance and an example of a micaceous sandstone tile with a peg hole. The remaining fragments thought to derive from roofing did not merit retention as there were no peg holes present to provide a definitive identification.

None of the Afs from the site were sufficiently diagnostic or in good enough condition to merit retention. The cobble and most of the small stone fragments were discarded, the exception being the marble fragments and the fragment with reeding.

OTHER BUILDING MATERIALS

Asbestos

A single fragment of asbestos painted orange on one side was recovered from Context 4. This was clearly of 20th century date.

M*ortar*

Eight fragments of mortar were present from Contexts 5, 42, 46 (four fragments), 250 and T29. The composition of these suggests that five different mortars were present all of which were lime based. While two of these fragments were recovered from contexts containing medieval CBM and four from a context containing 17th century or later CBM, it is impossible to state the original date of this mortar, as it could represent residual material

Plaster

A fragment of pink-buff coloured plaster was recovered from Context 4, given the date of the context in question this is probably of 19th century date, though it could represent residual material.

Opus signinum

Opus signinum is a Roman building material comprising a mixture of mortar and crushed ceramics. This material had hydraulic properties and was used in structures requiring waterproofing such as coverings of cistern and in the suspended floors of bath houses, though it could also be used in ordinary floors (Malacrino 2010, 71-2).

There were 22 small fragments of o*pus signinum* all with broken surfaces; none of the original smoothed upper surfaces survived. These items could have originated from either the nearby Roman bath building or the high-status building with a mosaic floor located to the south-west of the site.

Summary and Recommendations for further work

None of these fragments merits further research due to their small size and fragmentary nature.

They could be briefly summarised in any publication relating to the site. None were worthy or either illustration or museum display.

Retention/Discard

None of this material was retained as it was too badly fragmented, the exception being the plaster which retained its' original faced surface.

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