

Assessment of the iron working remains from Crossrail, Liverpool Street Station (XSM10)

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1.1 Introduction/Methodology

The Crossrail, Liverpool Street Station site (XSM10) yielded small quantities of iron working remains amounting to almost 5 kg. A number of smithing hearth bottoms (SHB) pointed to smithing activities during the early Roman period although no *in situ* evidence was found. The remains were assessed using visual analysis based on colour, texture and morphology, as well as density and magnetic susceptibility, with the aim of identifying the metalworking processes occurring on site. This assessment will describe the material by period, before discussing the potential significance and recommendations for further work. The material sorted by type and period is given in Table 1, while a full sample catalogue is presented in Appendix A.

Table 1. Iron working remains sorted by type and period. Weight in grams.

	Undiag	SHB	VHL	Cinder	Total
Roman: 60-200AD	1129	1899	397	0	3425
Late Roman: 250-400AD	503	390	55	0	948
Post-med: 1500-1800AD	209	226	0	100	535
Total	1841	2515	452	100	4908

Undiag = Undiagnostic Fe slag; SHB = smithing hearth bottom;

VHL = vitrified hearth lining

1.2 Results

1.2.1 ROMAN (60-200AD)

The vast majority of the identified iron working remains came from contexts dated to the late 1st and 2nd centuries. This included 1129g of undiagnostic iron working slag, and 1899g of SHB, mainly from two contexts; [6751], which included undiagnostic iron slag and all the identified vitrified ceramic hearth lining, and [6822] with undiagnostic Fe slag and a partial fragment of a SHB (543g). A further five smithing hearth bottoms were found in [6565], [6772], [6787], [6834] and [6856]. These averaged 317g in weight, and 9 by 8cm across and 4cm thickness, although some are likely to be partial fragments. These fragments provide evidence for smithing. The contexts were mainly dumps or ditches, with no evidence for *in situ* working, in addition no hammerscale was presented for assessment.

1.2.2 LATE ROMAN (250-400AD)

Lesser quantities of material were from contexts dated to the 3rd and 4th centuries, the vast majority from [6777], a sandy clay deposit, which contained 3 fragments of VHL (55g), a single smithing hearth bottom (390g), and 8 pieces of undiagnostic iron slag (408g), some with adhering

flake hammerscale. Small amounts of undiagnostic Fe slag were also recovered from [6587] and [6716]. This material was likely dumped or transported from elsewhere.

1.2.3 POST-MEDIEVAL (1500-1800AD)

Lastly, small quantities of material were recovered from post-medieval contexts amounting to 209g of undiagnostic Fe slag, some with embedded coal fragments, and a single SHB (226g). In addition, 100g of cinder was identified but this was from an unknown high temperature process. None of the remains were *in situ*, with material coming from burial ground soil – [3010] and [3023] – and cesspit and ditch fills – [3849] and [6637].

1.3 Conclusions, significance and recommendations

This was a small assemblage of material associated with the smithing of iron. The vast majority of remains were confined to the Roman period dating 60-200AD. This contained most of the iron working slag and also the greatest abundance of smithing hearth bottoms, indicating iron working activity in this area to be potentially most productive during this period. The finding of vitrified ceramic hearth lining infers the use of simple clay lined hearths, but no additional information is discernible. There is no evidence for *in situ* smithing from any period, and the material found was most likely dumped from nearby smithing sites. There was no evidence for other metalworking activities.

The significance of this site is low and there are no recommendations for further work.

1.4 Task List

If publication report is required:

Task 1. Review the finalised stratigraphic details and update the chronological and spatial context of the material.

Task 2. Write chronological narrative.

Time: 0.5 days.

1.5 Appendix A. Catalogue of samples.

Context	Quantity	Weight (g)	Material	Description (measurements in cm)
Roman 60-200AD				
6565	1	264	SHB?	8 by 9.5 and 5 deep
6751	3	397	vitrified hearth lining	adhering Fe slag and charcoal fragments
6751	4	448	undiag Fe slag	embedded charcoal
6772	1	336	SBH?	9 by 9 by 3.5 deep
6787	1	150	small SHB	partial fragment? Iron off-cut in centre and embedded charcoal fragments; 7 by

				7 by 3 deep
6822	1	543	SHB	partial fragment; 11 by 7.5 and 4 deep
6822	2	620	undiag Fe slag	
6834	1	263	SHB	corroded iron off-cut in centre; 8.5 by 8.5 and 4.5 deep
6834	1	61	undiag Fe slag	
6856	1	343	SHB	dense; 10 by 8 by 3 deep

Late Roman 250-400AD

6587	2	36	undiag Fe slag	
6716	1	59	undiag Fe slag	
6777	3	55	vitrified hearth lining	With adhering black Fe slag
6777	1	390	SHB?	slightly rounded base with adhering charcoal fragments; 9 by 7.5, by 5.5 deep
6777	8	408	undiag Fe slag	adhering flake hammerscale

Post-medieval 1500-1800AD

3010	1	83	undiag Fe slag	black, quite glassy
3023	1	34	undiag Fe slag	siliceous, glassy, embedded fragment of coal
3849	13	100	cinder	low density vitrified ceramic. Unknown high temperature process
6637	1	226	SHB fragment?	partial fragment?; black, high density; 9 by 7 by 4 deep
6637	1	92	undiag Fe slag	