C261 ARCHAEOLOGY EARLY EAST

Interim Statement

Archaeological Watching Briefs and Evaluation

C123 Limmo Peninsula Shaft - XRW10

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				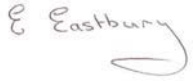	

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1 Introduction

This Interim Report covers four phases of archaeological excavation carried out at Limmo Peninsula Shaft by the C257 Museum of London Archaeology (MOLA).

All fieldwork was conducted between 09/08/10 to 03/12/10 and supervised by Robert Hartle (MOLA Supervisor), and included:

- A General Watching Brief on Gas Main Diversion at Limmo Peninsula from 09/08/10 to 11/08/10.
- A Targeted/General Watching Brief on removal of overburden from 05/11/10 to 09/11/10.
- Evaluation Trenches 1 and 2 from 10/11/10 to 23/11/10 (including terrier rig 22/11/10 to 23/11/10).
- Extension to the north and south at the western end of Trench 2 to Trench 1 from 01/12/10 to 08/12/10.

The event code (sitecode) is XRW10.

This document is an Interim Statement of the results of the completion of fieldwork at Limmo Peninsula Shaft. More extensive background, results, and conclusions will be included the Fieldwork Report which will be submitted within six weeks of the end of fieldwork (Crossrail, *Archaeology, Specification for Evaluation & Mitigation (including Watching Brief, Doc No. CR-PN-LWS-EN-SP-00001*, v. 0.3, 26.06.09).

The fieldwork was carried out in accordance with:

- A Crossrail **Site-specific Written Scheme of Investigation** (SS-WSI): *C123 INTERMEDIATE SHAFTS Limmo Peninsula Shaft*, Doc No: C123-JUL-T1-TPL-CR086_SH003_Z-00001, Revision 7.0, June 2010
- An **Addendum to the WSI**: *Addendum to SSWSI: Trial Trench Evaluation and Detailed Excavation – Limmo Peninsula Shaft,* Doc No: C123-JUL-T1-RGN-CR144_SH011_Z-00002, Revision 3.0, October 2010
- **An Archaeological Method Statement**: MOLA, *C261 Early East Section Method Statement for an Archaeological Evaluation and Watching Briefs at Limmo Peninsula Shaft* (C123), Doc No: C261-MLA-T1-GMS-CR094-00001, Version 2, 10/11/10

2 Aims and Objectives

These are defined in the SS-WSI and are reproduced below.

2.1 Research Aims

The following site specific research aims can be outlined for the investigations at the Limmo Peninsula shaft:

- What is the development of the local landscape and topography of the junction of the Lea and Thames floodplains from prehistory to the medieval period? Are any peat deposits present? If so, at what level(s) and at what date did they form? Is there evidence for river scour removing prehistoric alluvial deposits, or conversely, do they survive?

- Is there any evidence for prehistoric activity that has survived later river scouring? If prehistoric remains are present, what is their character and what can be learned about the exploitation of the floodplain by prehistoric groups? In particular, is there any evidence for Mesolithic activity at the base of the alluvium/surface of the sands? Is there any evidence for timber track ways or other structures of later prehistoric date?
- Is there any evidence for Roman activity, in particular for reclamation or flood defences, and marine transgression and regression?
- Is there any evidence for the medieval manor of Covelees?
- What can be learned about the process of land reclamation and management of the area from the medieval period until the construction of the shipyards and wharves in the mid 19th-century?
- What is the evidence for the development of the area in connection with the Thames Ironworks and other shipyards and wharves during the 19th-century?
- Is there any below-ground or above-ground evidence for the 19th-century Thames Ironworks, and other shipyards and wharves? In particular, is there evidence for the internal railway systems, dock structures, or slipways?

2.2 Fieldwork Objectives

The general aims of the investigations at Limmo Peninsula were:

- To gain an understanding of the development of the landscape from Pleistocene to medieval periods.
- To gain an understanding of the development of the site of the former Thames Ironworks and Ship Building Company Ltd.

3 Provisional Results

3.1 General Watching Brief on Gas Main Diversion at Limmo Peninsula

Eastern stopple pit, looking south-west (above) and base of eastern stopple pit, looking north-east (below)

3.1.1 Eastern Stopple Pit

Eastern Stopple Pit	
Location	Eastern stopple pit, south-east within Limmo Peninsula C123
Dimensions	4.6m (N to S) x 10m (E to W) x 3.6m (deep)
London Survey grid co-ordinates	89848 35459
OS National grid co-ordinates	539626 180974
Modern Ground Level (adjacent to pit)	106.6m ATD (6.6m OD)
Modern subsurface deposits	Reddish brown course sandy silt (37), with occasional clay lenses and 20th-century rubble (concrete, brick, rubbish etc).
Level of base of archaeological deposits observed and/or base of pit	103.58m ATD (3.58m OD)
Natural geology observed	Not reached and beyond the depth of this trench
Extent of modern truncation/overburden	To a depth of 1.3m ATD (3m OD)
Archaeological and built heritage remains	**Date**
Reddish black course gravel silty sand clinker deposit (38), with frequent small-large fragments of slag and occasional brick fragments at 103.58m ATD (3.58m OD)	19th or early 20th-century
Pit interpretation and summary	
As in the western stopple pit, the lowest layer [38] at the base of the trench may again have been a 19th-century dump layer or associated with the abandonment of the site in the early 20th-century. The subsurface deposit [37] was undoubtedly 20th-century made ground.	

3.1.2 Western Stopple Pit

Western Stopple Pit	
Location	Western stopple pit, south-west within Limmo Peninsula C123
Dimensions	4.6m (N to S) x 10m (E to W) at top x 3.6m (deep)

London Survey grid coordinates	89704 35496
OS National grid coordinates	539482 181008
Modern Ground Level (adjacent to pit)	106.6m ATD (6.6m OD)
Modern subsurface deposits	Unknown – already dug and shoring install by the time of my arrival on site.
Level of base of archaeological deposits observed and/or base of pit	Base of trench 103m ATD (3m OD)
Natural geology observed	Not reached and beyond the depth of this trench
Extent of modern truncation/overburden	Unknown
Archaeological and built heritage remains	**Date**
Black Silty clinker layer [39] at the base of the pit, including brick, slag, timber fragments and timber beams (unclear if any were insitu or re-deposited).	Undated – probably 19th or early 20th-century.
Pit interpretation and summary	
This pit received minimal monitoring, as it had already been completed by the time MOLA had been called to site. Access was not available and the base of pit was observed from the top of the trench, while sides of the trench were obscured by shoring sheets. The lowest layer [39] at the base of the trench may have been a 19th-century dump layer (similar to layer [18] in Evaluation trench 1 and [36] in Trench 2) or associated with the abandonment of the site in the early 20th-century (layers [1] and [2] in trench 1 and [27] in Trench 2).See 3.3 Evaluation Trenches.	

3.2 General Watching Brief on Made Ground Reduction at Limmo Peninsula

Area at Limmo Peninsula reduced from 107m ATD (7m OD) to 105m ATD (5m OD), looking west

Ground reduction (107m ATD to 105m ATD), and the removal of DLR rubble and overburden was monitored by MOLA Senior Archaeologist. The DLR rubble was very mixed clay and silt containing frequent small to large concrete fragments, timber beams and modern rubbish, including plastics. No archaeological features were encountered.

3.3 Evaluation Trenches

See Fig 1 *for trench location*

3.3.1 Trench 1

Trench 1 (right), looking west, with Structures [12] and [13] (front) and timbers [16] & [15] and concrete pads [14] (centre)

Trench 1	
Location	Limmo Peninsula, north within the area of future Limmo Peninsula Shaft
Dimensions	34m long (east to west) x 5.5m wide (north to south) x 3m deep (maximum)
London Survey grid coordinates	89743 35522
OS National grid coordinates	539519 181035
Modern Ground Level	Excavation began at 5m OD (105m ATD), which was the approximate base of the DLR rubble dumps and top of earlier mid to late 20th-century made ground.
Modern subsurface deposits	Subsurface deposits were composed of 20th-century made ground dumps of mixed clay, ash and demolition material (Contexts [4],[5],[6],[7],[8],[9],[10] and [11]).
Level of base of archaeological deposits observed and/or base of trench	Archaeological deposits encounter from 103.5m ATD (3.5m OD) Base of trench: 102.6m ATD (2.6m OD), extended to 102m ATD (2m OD) within

	three small test pits at the west, centre and east of the trench.
Natural observed	Natural not reached during excavation
Extent of modern truncation/overburden	To a depth of 103.5m ATD (3.5m OD) minimum
Archaeological remains	**Dating Evidence, Finds, and Samples**
Clinker deposit [18], with large fragments of slag and occasional brick.	Undated – no dating evidence, assumed to be 19th-century made ground Bulk sample (10 litres) (No. {1})
At the eastern end, at 3.5m OD, was rectangular brick structure [12], with three walls, internally backfilled with gravel and rubble, surrounding a brick floor surface two courses deep. Attached to this structure at the north was a square brick structure [13]. A holding down bolt was still present at the corner of structures [12] and [13]. Structure [12] appeared to be truncated south by a metal pipe and a concrete floor. The construction cut of structure [12] and [13] must have truncated layer [18], however, it is not now visible, having presumably been immediately backfill post-construction with the same material it truncated.	Brick Samples taken – London stock bricks, approximately 19th or early 20th-century.
Horizontal timber beams [16] and planks [15] in the eastern half of the trench.	Undated
Concrete pads with inlaid timbers and bolts [14] in the centre of the trench.	Undated
A possible floor surface of rammed clinker material [17] surrounding the area of the concrete [14].	Undated
Clinker deposits [1] and [2], overlaying Structures [12] and [13].	Pottery: Early 20th-century Clay Tobacco Pipe: 19th or early 20th-century. Glass: Early 20th-century
Interpretation and summary	
The lowest archaeological layer exposed, the clinker deposited at the base of the trench [18], is most likely a 19th-century made consolidation layer associated with the original construction of the Ironworks, onto which all the features found in trench were then constructed. Brick structure [12] could possibly have been a small workshop or perhaps some kind of working platform. However, it is impossible to determine if its wall originally continued above the level of the brick floor. A bolt survived at the corner of	

structures [12] and [13], and may have once tethered some form of machinery to the structures. A metal pipe was also found along the west face of structure [12] and may have also been associated with machinery, perhaps providing steam or water? The function of the small square structure [13] at its north is unclear. Perhaps this may been the truncated base of a chimney?

The concrete pads [14] seem to be the footings for machinery, which would have been bolted down, while the associated timbers and floor surface ([15], [16] & [17]) were most probably decking or a walkway and work surfaces (rather than railway sleepers).

The latest deposits [1] and [2] are almost certainly demolition dumps associated with the abandonment of the Ironworks in the early 20th-century.

3.3.2 Trench 2

Trench 2 (left), looking west, with timber baseplates with concrete [32] & [33] and timber sleepers (front) and brick structure [31] (rear)

Trench 2 Structure [31], looking south-east (above) and north (below), showing parallel flues and brick floored chamber

Trench 2	
Location	Limmo Peninsula, south within the area of future Limmo Peninsula Shaft
Dimensions	30 metres long (east to west) x 5 wide (north to south) x 3 deep
London Survey grid coordinates	89745 35507
OS National grid coordinates	539522 181019
Modern Ground Level/top of the slab	Excavation began at 5m OD (105m ATD), the approximate base of the DLR rubble dumps and top of earlier mid to late 20th-century made ground.
Modern subsurface deposits	Subsurface deposits were composed of 20th-century made ground dumps of mixed clay, ash and demolition material (Contexts [19],[20],[21],[22],[23],[24],[28] and [29])
Level of base of archaeological deposits observed and/or base of trench	Base of trench: 2.6m OD, extended to 2m OD within two small test pits at the west, by structure [31] and in the centre of the trench.
Natural observed	Natural geology not reached
Extent of modern truncation/overburden	103.4m ATD (3.4m OD) at east end and 103.5m ATD (3.5m OD) at west end
Archaeological remains	**Dating Evidence, Finds, and Samples**
Loose silty clinker dump layer (36) Lowest layer across the base of trench.	Undated – no dating evidence, assumed to be 19th-century made ground Bulk sample (10 litres) (No. {2})
An approximately rectangular brick structure [31] aligned north-south (top at 103.52m ATD (3.52m OD)). 6.7m of this structure was exposed within the limit of excavation. This structure was composed of two parallel horseshoe shaped barrel vaulted brick flues, which showed evidence of exposure to extreme heat, and were partially filled with an unidentified accumulated industrial by-product [30]. A brick pit or chamber was also attached to the north. The construction cut of structure [31] must have truncated layer (36), however, it is not now visible, having presumably been immediately backfill post-construction with the same material it truncated.	Brick samples - 19th or early 20th-century fire bricks and London stock brick. Bulk environmental sample (10 litres) (No. {3}), taken from the fill (Context 30) of the flues within structure [31].

Rammed silty ash clinker layers [25] and [26]	Undated
Parallel horizontally laid timber beams or sleepers (34), inlaid into layer [26]	Undated
Parallel concrete and horizontal timbers [32] and [33], found to the north-west and south-east of (34), which were also cut into layer [26]	Undated
Ash clinker demolition layer [27] covered all archaeological features.	Undated

Interpretation and summary

As with Trench 1, a clinker layer (36) at the base of the trench, is most likely a 19th-century consolidation layer composed of dumped industrial waste associated with the original construction of the Ironworks, which formed a foundation layer for the features.

The timber beams (34) found at the east end of Trench 2, set into a floor surface of rammed clinker [26], may have been sleepers for the Ironworks railway system or perhaps for machinery within a building. Indeed, parallel concrete and horizontal timbers [32], and [33], found to the north-west and south-east of (34) and also set into layer [26], may have been the remains of workshop foundations.

The function of the rectangular brick structure [31] is unclear, although presumably involved industrial processes such as metal working or forging, given the presence of firebricks, charring, and industrial residues [30] within the flues. It seems to have been only partially demolished prior to its abandonment and backfilling.

All archaeological features appear to have been covered by an ash clinker demolition layer [27], itself overlaid by the modern overburden (Contexts [19],[20],[21],[22],[23],[24],[28] and [29]).

3.3.3 Terrier Rig Window Sample Results

Trench 2 with terrier rig in operation, looking north-west

AH1 (Trench 2)					
Location				Evaluation Trench 2, Limmo Peninsula	
OS National grid coordinates				539532 181019	
LSG grid coordinates				89755 35507	
Surface Level				2.75m OD (102.75m ATD)	
Natural observed				-1m OD (99m ATD)	
Top (m)	**Base (m)**	**Top (m OD)**	**Base (m OD)**	**Description**	**Interpretation**
0	1.5	2.77	1.27	Iron concretions/slag Context [36]	Iron smelting waste. Post medieval.
1.5	3.75	1.27	-0.98	Light brownish grey laminated clayey silt with occasional mollusc fragments and occasional fine rooting. Grades into unit below.	Partially oxidised, indicating fairly dry terrestrial soils episodically inundated by overbank flood events. Historic alluvium.
3.75	6.75	-0.98	-3.98	Light grey finely laminated silty clay with bands of	Upper marsh or mudflat clays and peats. Historic /

				dark grey humified organics/peat occasionally throughout, no rooting, grades into below	late prehistoric alluvium.
6.75	7.85	-3.98	-5.08	Light grey clay silt with laminations of fine sands (increasing in size and frequency with depth).Clear and horizontal contact.	Marsh/Mudflat clays, with more fluvially active episodes indicated by sandy lenses. Prehistoric alluvium.
7.85	7.85	-5.08	-5.08	Dark grey, fine to medium sands with granular flint gravel.	Pleistocene gravels

AH2 (Trench 1)					
Location				Evaluation trench 2, Limmo Peninsula	
OS National grid coordinates				539530 181034	
LSG grid coordinates				89754 35522	
Surface Level				2.75m OD (102.75m ATD)	
Natural observed				0.45m OD	
Top (m)	**Base (m)**	**Top (m OD)**	**Base (m OD)**	**Description**	**Interpretation**
0	1.2	2.75	1.55	Iron concretions/slag Context [18]	Iron smelting waste. Post medieval.
1.2	2.3	1.55	0.45	Light brownish grey laminated clayey silt with occasional mollusc fragments and occasional fine rooting. Grades into unit below.	Partially oxidised alluvium, indicating fairly dry terrestrial soils episodically inundated by overbank flood events. Historic alluvium.
2.3	3.1	0.45	-0.35	Light grey finely laminated silty clay with bands of dark grey humified organics/peat occasionally throughout, no rooting, grades into below	Upper marsh or mudflat clays and peats. Historic / late prehistoric alluvium.
3.1	7.7	-0.35	-4.95	Light grey clay silt with laminations of fine sands (increasing in size and frequency with depth).Clear and horizontal contact.	Marsh/Mudflat clays, with more fluvially active episodes indicated by sandy lenses. Prehistoric alluvium.

7.7	7.9	-4.95	–5.15	Dark grey, fine to medium sands with granular flint gravel.	Early Holocene sands. Prehistoric (Mesolithic)
7.9	8.12	–5.15	–5.37	Coarse grey sand and angular grey flint gravel	Early Holocene gravels
8.12	8.2	–5.37	–5.45	Dark brown organic silt	Possible Allerod deposits
8.2	8.3	-5.45	–5.55	Dark brown organic silt with angular gravel	Possible Allerod deposits
8.3	8.5	–5.55	–5.75	Coarse orange sand and angular orange flint gravel (depth unknown)	Pleistocene gravels

3.4 Targeted Watching Brief on Extensions to Evaluation Trench 2 at Limmo Peninsula

Trench 2 extension, looking south-west (above) and north (below), showing structure [31]

Trench 2 (Extended)	
Location	Limmo Peninsula, south within the area of future Limmo Peninsula Shaft
Dimensions	30 metres long (east to west) x 5 wide (north to south) x 3 deep Extension: North - approximately 2m wide (E to W) x 10m long in to Trench 1 (N) South - approximately 6m wide (E to W) x 4m (S)
London Survey grid coordinates	89745 35507
OS National grid coordinates	539522 181019
Modern Ground Level/top of the slab	Excavation began at 5m OD (105m ATD), the approximate base of the DLR rubble dumps and top of earlier mid to late 20th-century made ground.
Modern subsurface deposits	Subsurface deposits were composed of 20th-century made ground dumps of mixed clay, ash and demolition material
Level of base of archaeological deposits observed and/or base of trench	Base of trench: 102.6m ATD (2.6m OD)

Natural observed	Natural not observed
Extent of modern truncation	103.5m ATD (3.5m OD)
Archaeological remains	**Dating Evidence, Finds, and Samples**
Brick structure [31] was further exposed to an extent of 11.5m long (N to S) x 5.8m wide (E to W) x >0.9m high. This structure was composed of two parallel barrel vaulted brick flues and, to the north and south, various chambers/pits floored with brick, themselves connected by raised brick floor surfaces. The end of the brick chamber at the north end of brick structure [31] was revealed and marked the structure's north limit. The structure still extended into the south limit of excavation, although a south-east corner was discovered.	19th or early 20th-century. No further samples
Interpretation and summary	
The full extent of structure [31] was discovered to the north, east and west. Further excavation has revealed it to be a much more complicated structure than previously thought. Although still not fully uncovered, a south-east corner was found and may represent the south limit of the feature. Unfortunately, the function of rectangular brick structure [31] remains unclear at this time.	

4 Significance of Results (provisional)

4.1 Summary of Fieldwork Results

- Modern 20th-century overburden/made ground (DLR waste) was at least 1.5m thick, between 105m ATD (5m OD) and 103.5m ATD (3.5m OD).
- Natural geology was encountered at -1m OD (99m ATD) in window sample AH1 (located in Trench 2) , and at 0.45m OD (100.45m ATD) in window sample AH2 (located in Trench 1).
- GLIAS specialists Malcom Tucker and Robert Carr visited the site on Tuesday 7th December. Unfortunately, although clearly representing activity from the later phase of the Thames Ironworks (c1890 to 1912), the exact function or nature of the structures within Trenches 1 & 2 still remains unclear. Further historic documentary research will hopefully contribute further to the interpretation of these features.
- Paul Thrale, MOLA timber specialist visited the site on Monday 6th December and identified that the timber beams (34) found at the east end of Trench 2, may have been sleepers for the Ironworks railway system identified on the 1869 OS mapping. Timbers [32], and [33], may have been the remains of workshop foundations.

- Analysis of bulk samples from the fill of the flues could also provide further detail about the function of structure [31] in Trench 2. In addition, the analysis of the bulk samples of 19th-century made ground (contexts 18 and 36) in the base of Trenches 1 and 2 should provide confirmation of its composition.

4.2 Importance of Resources

The archaeological remains identified in the fieldwork are provisionally assessed as being of moderate importance. They represent a series of well preserved industrial features, albeit partially truncated, whose function, although not precisely identified at this point, is clearly associated with the iron working on this ironworks and ship building site.

4.3 *Provisional* Assessment of Results against Aims and Objectives

Window sample AH2 recorded possible allerod and Mesolithic deposits between -4.95 to -5.55m OD. Further analysis of the window sample cores at the post excavation stage has the potential to answer research questions relating to the prehistoric alluvial sequence.

While window samples from AH1 and AH2 do show historic and prehistoric alluvium at 1.27m and 1.55m OD beneath archaeological deposits [18] and [36] (the lowest deposits recorded during excavation in Trenches 1 & 2), there is no clear evidence for Roman to early 19th-century activity. Deposits [18] and [36] either directly overlay or truncate the alluvium and are possibly ironworks waste re-used as levelling for construction of the ironworks features observed in the trenches.

Iron working and other industrial features demonstrate some of the processes and some of the activities that took place in this area of the Thames Ironworks. These features when combined with documentary research will undoubtedly provide a greater understanding of the development and function of the site during the construction and operation of the former Thames Ironworks and Ship Building Company Ltd.

4.4 *Provisional* conclusions for future work

- A significant area within the proposed Limmo Peninsula shaft has now been evaluated.
- FDC Consultant Adam Brossler will produce recommendations for further work if necessary during the Limmo Peninsula Shaft excavation.

5 Future Deliverables

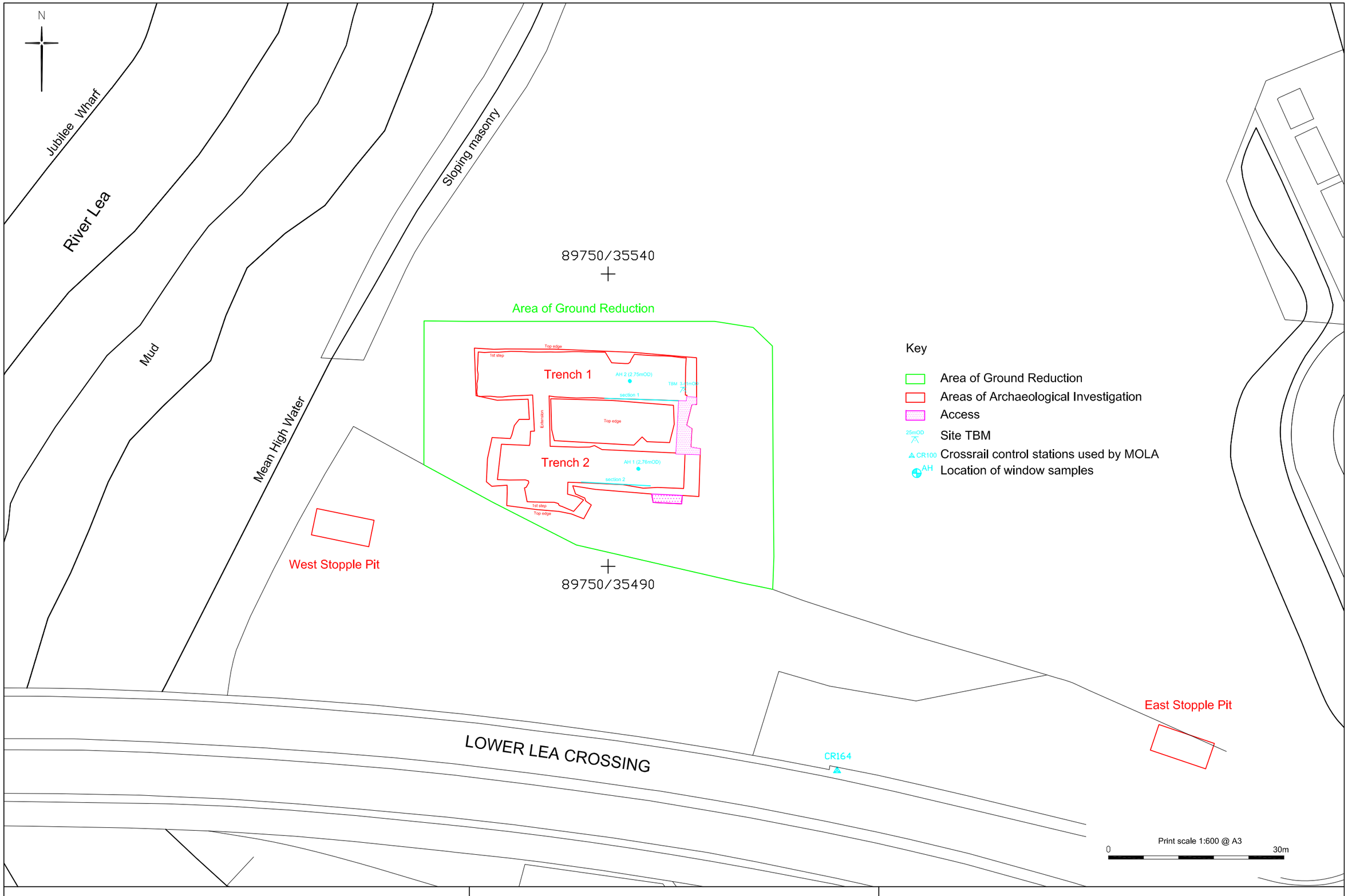
The remaining deliverables for the site and their delivery dates as specified by *Crossrail, Archaeology, Specification for Evaluation & Mitigation (including Watching Brief, Doc No. CR-PN-LWS-EN-SP-00001*, v. 0.3, 26.06.09, are:

- **Survey Report** by Friday 17th December
- **Fieldwork Report** (including OASIS Summary Sheet) by Wednesday 19/01/10
- **Summary Report** by Wednesday 02/02/10

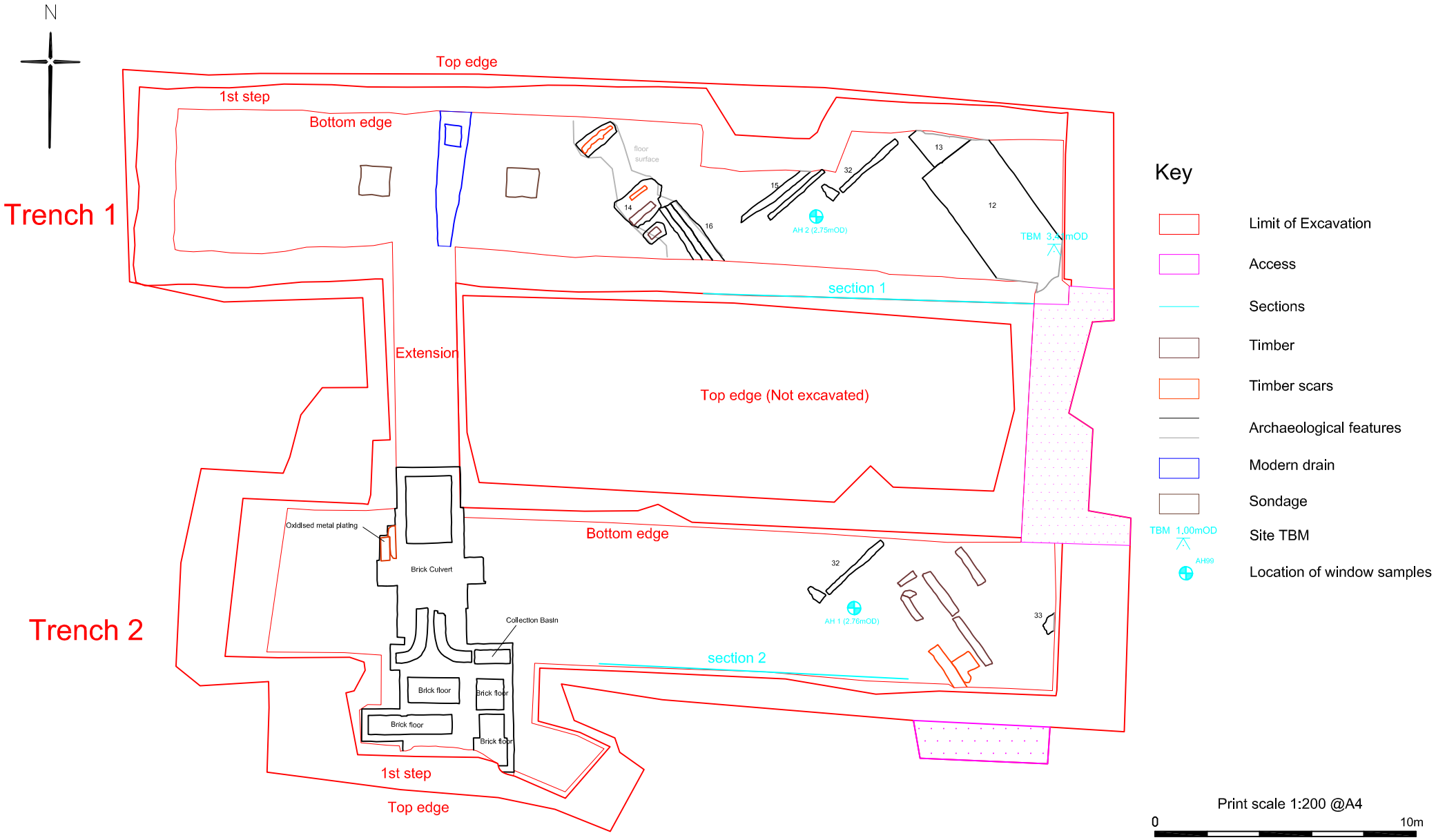
6 Annex 1 – Trench Location Plan

Fig 1 Location of trenches

(to be inserted in the PDF version of this document)



Event code / Site code:	Site Address:	Type of fieldwork:
XRW10: FIG 1	Crossrail: C123 Limmo Peninsula Shaft	TWB / Evaluation



Event code / Site code:	Site Address:	Type of fieldwork:
XRW10: FIG 2	Crossrail Limmo Peninsula C123	Evaluation / TWB