



C261 Early East Interim Statement

Archaeological Targeted Watching Brief at Instone Wharf (XRW10)

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Non Technical Summary

This report presents the results of an archaeological targeted watching brief carried out by Museum of London Archaeology (MOLA) at Instone Wharf at the Limmo Peninsula site, London E16, in the London Borough of Newham. This report was commissioned from MOLA by Crossrail Ltd.

This work is being undertaken as part of a wider programme of archaeological assessments and mitigations during railway development along the Crossrail route. The worksite at Limmo Peninsula (in the C261 Early East archaeology zone of the Crossrail Project) consists of two main areas, a storage/treatment compound for excavated material from tunnelling removed from the Limmo Peninsula shaft and a conveyor for excavated material leading south to a barge loading facility at Instone Wharf at the mouth of the Lea. This interim report covers a targeted watching brief undertaken in the southern part of the Instone Wharf 'Muck Pit' site.

A trench was machine excavated under archaeological supervision to remove modern made ground down to the level of surviving features of the Thames Ironworks. After recording of the Ironworks features, a sondage was excavated through the underlying deposits down to formation level for the Crossrail Muck Pit.

The lowest point of the sondage exposed historic alluvium associated with the River Lea. Overlying this were 19th-century land raising deposits sealed by industrial waste probably from the Ironworks. This sequence was very similar to that found earlier this year within the footprints of the Crossrail Main and Auxiliary Shafts to the north. Overlying this, and again similar to the Main and Auxiliary Shaft sites, remains of the Thames Ironworks (1846–1912) survive, in part beneath a more recent building (demolished), all below modern (20th-century) made ground.

Features within the targeted watching brief trench correspond to buildings of the Thames Ironworks identified on historic Ordnance Survey maps, and also an auction survey map of 1913. Comparison of the archaeological results with this map demonstrate that the trench uncovered the main wall between the Erecting Shop and the Machine Shop, behind the office building of the Thames Ironworks. Also found were a series of concrete structures related to as-yet unidentified industrial processes in the area of the Machine Shop, and an array of concrete structures including structural piles in the Erecting Shop.

Early 19th-century consolidation and the subsequent construction of the Thames Ironworks either truncate or directly overlay the historic alluvium, and have most likely destroyed any earlier archaeological remains within their footprints.

Because of the potential to correlate the well-preserved industrial structures with historic maps and documents relating to the Thames Ironworks, as well as the formative nature the Ironworks had on the industrial and urban development in this part of London, the results from Limmo Peninsula are assessed as being of regional significance.

The results of this report will help inform further work to be undertaken at the Instone Wharf site.

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1 Introduction

This Interim Statement covers an archaeological targeted watching brief carried out at the southern part of the Crossrail 'Muck Pit' (tunnelling spoil temporary storage facility) at Instone Wharf, by the C261 Museum of London Archaeology (MOLA).

This was carried out between 17 May 2012 and 1 June 2012 and supervised by MOLA Senior Archaeologists Robert Hartle and Danny Harrison.

It was recorded under event code (sitecode) **XRW10**.

This document is an interim statement of the results of the fieldwork one week after the end of this phase of fieldwork. More extensive background, results, and conclusions will be included in the Fieldwork Report which will be submitted within six weeks of the end of a further phase of fieldwork (Crossrail, *Archaeology, Specification for Evaluation & Mitigation (including Watching Brief, Doc. No. CR-PN-LWS-EN-SP-00001*, v. 5.0, 13.07.11), which is provisionally due to start in August 2012 .

All levels in this document are quoted in metres Above Tunnel Datum (m ATD). To convert Tunnel Datum to Ordnance Datum subtract 100m, ie 1m OD = 101m ATD.

The fieldwork was carried out in accordance with:

- A Crossrail **Site-specific Written Scheme of Investigation (SS-WSI)**: *Limmo Peninsula Shaft Site-specific Written Scheme of Investigation*, doc. No: C123-JUL-T1-TPL-CR144_SH011_Z-00001, Rev. 9.1, 04/04/11
- **Addendum SS-WSI** – Crossrail, doc. No: C123-XRL-T1-TPL-RGN-CR144_SH011_500001, Revision 1.0, February 2012
- Crossrail, **Archaeology, Specification for Evaluation & Mitigation (including Watching Brief)**, doc. No: *CR-PN-LWS-EN-SP-00001*, v. 5.0, 13.07.11
- *C261 Archaeology Early East, Method Statement, Archaeological Evaluation at Instone Wharf, Limmo Peninsula (XRW10)*, doc. No: C261-MLA-X-RGN-CR140-50092 Revision 2.0, 11/05/12



2 Aims and Objectives

The overall objectives of the investigation are to establish the nature, extent and state of preservation of any surviving archaeological remains that will be impacted upon by the development.

2.1.1 Site Specific Research Aims

The following site specific research aims were specified in the WSI Addendum (Crossrail 2012, Par 2.1.2, p5):

- Expose, investigate and record structural elements of the Thames Ironworks Ship Building and Engineering Company that occupied the site between 1846 and 1912 AD. Surviving structural remains relating to the Thames Ironworks have been positively identified within the Limmo Peninsula Shaft worksite by previous archaeological evaluation and recording work at between 102.50-103.50m ATD (Crossrail, 2011a; Document No. C261-MLA-X-RGN-CR140-50034, see also latest information from the Auxiliary Shaft WB above)
- Investigate, retrieve soil samples and record the Thames floodplain alluvial sequence on the site.

2.1.2 Relevant Regional Research Aims

In addition to the site specific research aims, the site has potential to address several regional research aims identified in the regional research agenda 'A Research Framework for London Archaeology', Museum of London, 2002. The regional research themes considered relevant to achieving an understanding are as follows (page numbers in brackets):

- The significance of geomorphology, palaeoecology, ecosystems and climate, hydrology, and vegetation and faunal development, on human lives (p 79);
- London's hydrology, river systems and tributaries particularly the role of the River Thames, as boundary, communication route, resource, ritual focus etc, in shaping London's history, and the relationships between rivers and floodplains (p 79);
- The relationship between landscape, river and settlement, and the influences of the River Thames in particular on communications and social interaction (p 79); and
- The development of London's Docklands and Waterways (p 82).

3 Provisional Results

See Error! Reference source not found. in Annex 1 for the location of the trench

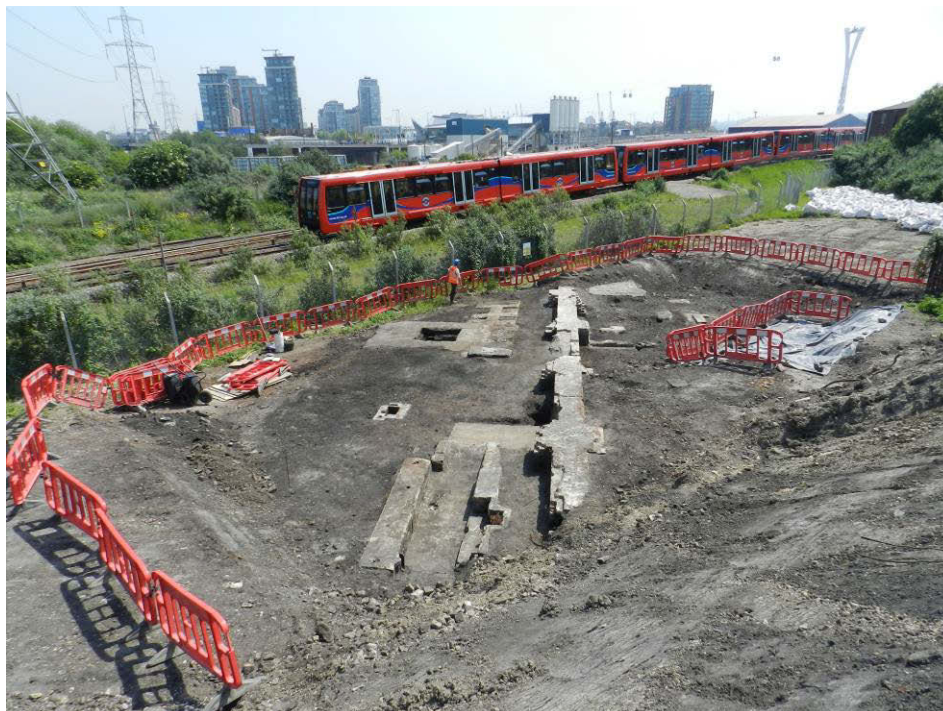


Photo 1 targeted watching brief area looking south-east

Instone Wharf Targeted Watching Brief	
Location	Instone Wharf
Dimensions	26m SSE-NNW x 15m WSW-ENE
OS National grid coordinates (Centrepnt)	539654 180738
LSG grid coordinates (Centrepnt)	89980 / 35256
Modern Ground Level	105.40mATD
Modern subsurface deposits	Made ground, post 1950s. A mixture of topsoil and demolition debris covering the whole trench, between 105.40mATD and 105.25mATD (high point) 104.30mATD (general).
Lowest level of archaeological deposits observed	Historic alluvium [121] continues below 94.80m ATD
Natural observed	(Not seen)



Extent of modern truncation	No truncation other than the modern demolition of the structures prior to the deposition of rubble, clinker and modern made ground over the remains.
Archaeological remains	Dating Evidence, Finds, and Samples
Historic alluvium [121] , between 102.12m and 100.67m ATD (base of excavation).	None
Victorian made ground [120] , between 103.59m and 102.12mATD.	None (some stock brick fragments noted but not retained)
Victorian ground consolidation [113] of clinker and foundry waste mixed with slag and scrap metal (iron), between 104.52m and 103.59mATD.	None
<p>Thames Ironworks Buildings and associated structures, highest point, 105.04mATD. The lowest points - the foundations, have not yet been bottomed:</p> <p>[95] is the main wall between the Erecting Shop and Machine Shop. [106] and [105] are backfill of construction cut [107] for the wall and its concrete foundations [112] which extend below 103.66mATD (the top of [112] was exposed in a mini sondage to the north of [95]).</p> <p>[110] Traces of a possible timber flooring for the Erecting shop.</p> <p>[96], [115], [116], [117], [118], [122] are all concrete structures in the Erecting Shop area- either bases for machines or structural.</p> <p>[99] and [100] consist of an array of concrete squares, all roughly one square yard (0.914m x 0.914m) in plan Those exposed in the sondage (Photo 8) appear to be over 3m deep, extending below 100.67mATD. They are likely to be concrete piles.</p> <p>[104]/[114], [103], [111], [97] and [98] are concrete structures in the area of the Machine Shop to the north of wall [95] (Photo 1). All are aligned with [95] and are assumed to be contemporary with the function of the Machine Shop. All except [111] quite likely form the bases for machinery that worked</p>	<p>[95] 1 Frogged yellow brick.</p> <p>[95] 1 Moulded Corner brick.</p>

<p>together. [103] (Photo 4) are concrete bases for track sleepers or an array of machinery. They seem to line up with [98] (Photo 5), which seems to be shaped to hold a large drum or wheel, perhaps a flywheel. [98] has large bolts for holding machinery set into the concrete. Perhaps the machinery acted as a plant to provide power or traction to [103]. [97] is a concrete platform that has been built to respect [98]. [104] is a substantial concrete base over 0.6m thick. In its centre there is a square opening which has been very robustly built to accommodate a large weight (Photo 6). Thick iron uprights protruding out of the concrete are set into a rectangular timber block made of several sleeper-like timbers. The base of this block was not seen, but it comprises a tightly fitting stack of at least two timbers thick. The tops of piles bolted to the timber stack were seen in two corners on the north eastern edge of the opening. They likely extend for several meters downwards as are similar to timber piles seen in the Auxiliary Shaft. The piles and the timber stack/block are [114]. Given the substantial nature of the base and the fittings it has been suggested that [104/114] are the base for some kind of lifting equipment- perhaps a hoist or crane.</p> <p>[111] is a brick drain access to a large stoneware pipe (Photo 7), aligned perpendicular to wall [95]. The pipe leads towards the wall. Bolts in the top of the brick shaft may have either held a cover or perhaps a tank/machine/pipe which vented into this drain.</p>	<p>[111] 2 Bricks.</p>
<p>Modern building [101] (Walls and floor slab). Visible on Ordnance Survey maps post-1952. Part of post-World War II development of site. (Concrete foundation [108], Construction cut [109].) The highest point for the wall/slab is on the remaining floor slab itself 105.25mATD. The lowest point for the structure and its associated construction cut [109] is at 103.85mATD at the base of the cut.</p>	<p>[101] 1 Brick</p>

[102] is an area of floor slab with an imprint of an outline of possible machinery. It has several bolts set into it. It seems likely that [102] is a part of a floor in the Erecting shop, however it may be part of a later structure on the site. The height on the slab is 104.49mATD. The slab is over 0.7m thick.

Interpretation and summary

Deposit [121] is the topmost deposit of a historic estuarine alluvium laid down over several hundred years prior to the levelling and consolidation in the Victorian period, in preparation for the construction of the Thames Ironworks.

Above this was a layer of clay [120] laid down in the 19th century as ground levelling/raising and above this a layer of industrial waste [113], consisting of foundry slag mostly, which had been laid down as a hard base for the Ironworks itself. The 19th-century clinker dumping [113] had already been observed during the evaluation phase as [18] and [36] and as [47] during the phase in the Main and Auxiliary Shafts.

The very substantial foundations and wall of the Erecting shop are consistent with a heavy structure, in keeping both with the scale and industrial needs of the building. This appears from maps to be the main multi-storey complex also containing the offices of the Ironworks. It is likely that there are further pads or foundations not exposed during this targeted watching brief phase, but that will be revealed when the area is excavated further. Several of the pads appear to have been truncated to their tops during demolition, and some are probably still obscured by redeposited foundry clinker of the same type as [113]. The demolition of the building internally seems to have removed the level of the working area, and unfortunately this makes it very difficult to comment in depth on the processes in the Erecting Shop based only on archaeological evidence. Recesses in the southern face of wall [95] may have held timber floor joists (**Photo 3**). This would tally with the traces of timber seen as [110]. There were traces of rotten timber in several of the recesses- especially the wider, deeper ones. Some of the concrete bases, especially those hard up against [95] may have functioned as the bases for machinery, but this is speculative. The building appears to have been modified at least once – an area in the middle of the length of wall exposed seems to have once been an opening, but appears to have been bricked up.

The Machine Shop seems to have been a lighter structure, such as a shed, tacked on to the outer wall of the original building [95]. No foundations for an actual building were found, only the bases for the machinery. It is very difficult to ascribe actual processes to the bases, other than those already suggested. The area was clearly used to house substantial machinery, as would be expected with a shipyard.

The modern building [101] is present on Ordnance Survey maps from 1952, and may be part of the post World War 2 redevelopment of Instone (Instone's) Wharf. The building sits on the same alignment as the demolished Ironworks building, over which foundations the modern building has been built, in places cutting down into the earlier foundations or burying their tops. The building is of much lighter construction than the Ironworks building. It may relate to a post-war customs office that formed part of Instone Wharf.

It is not currently known exactly when the Ironworks was demolished, or whether the

buildings were taken apart piecemeal over time. It is also not yet known when the more modern building was constructed or demolished.



Photo 2 *The Northern half of the trench showing the features in the Machine Shop (to the left of the main wall [95])*



Photo 3 *Recess for a possible floor. A portion of rotten timber remains in situ.
(Looking north east)*



Photo 4 *Concrete bases [103] for track sleepers or an array of machinery. (Looking south east)*



Photo 5 Concrete structure [98] - possible the base for a machine with a large wheel or drum. Drain [111] is in the background and wall [95] (the wall separating the machine and erecting shops) is at right. (Looking east)



Photo 6 Concrete and timber structure [104/114] A possible hoist or crane base. (Looking north)



Photo 7 Drain [111]. (South-west at top of picture).



Photo 8 *The stepped sondage. (Looking north-east)*

4 Significance of Results (*provisional*)

4.1 Summary of Fieldwork Results

- The alluvium is undated, but is likely to have been deposited within historic times, as was that seen in the Main and Auxiliary Shafts.
- The thick layers of 19th-century clay and industrial waste/clinker were presumably laid down to raise the ground level, in order to prevent flooding and at the same time consolidate the ground to create hard standing for the Thames Ironworks buildings. Several very substantial 19th-century piles [99 and 100] have already been revealed, and it seems likely that there will be further structural support of a massive kind below wall [95] and structure [104]. This type of Victorian structural engineering tallies with the extensive foundations seen in the Shafts. The layer of clinker may not have been firm enough on its own over the clay and soft alluvium to support the weight of the buildings without substantial piling. This theory is supported by the observation that some of the less-well supported concrete structures, especially [103], have slumped under their own weight or the weight of the machinery/structure they were supporting.
- A range of structures associated with wall [95] and aligned with it are also identified with the Thames Ironworks, possibly for machinery. The two areas on either side of the wall have been identified via comparison with an Auction Survey map of 1913 (the 'Charles Warner' map currently held by Crossrail, which was kindly produced by the grandson of the last Ironworks manager) as being the Erecting Shop (south-west of the wall) and the Machine Shop (north-east of the wall). The archaeological results from the Machine Shop may provide more information on internal functions than the Erecting Shop, as a result of better survival of internal features. It is not entirely clear whether all of the parts in the Machine Shop were contemporary, although this seems likely. An exception may be the possible hoist/crane base [104]. A layer of roofing slate (probably from the Machine Shop roof demolition) covered the area north of wall [95] at the interface of the extant deposits/structures and the modern overburden. This layer indicates the original pre-demolition surface. It did not, however, fill the internal space of [104] (as it had done [98]), but lay above a backfill similar to [113], suggesting the mechanism was removed at some point during the use of the Machine Shop, and the area levelled to floor height.
- A fairly modern building [101], is clearly marked on post-World War II Ordnance Survey maps, was built aligned to, and within the footprint of, the Ironworks Offices and Erecting Shop, and had been demolished before the DLR was constructed. It was recorded before being removed to investigate the remains of the Ironworks beneath.
- The demolition rubble and waste clinker covering the remains of the Ironworks was treated as a non-archaeological modern deposit, its formation occurring after 1912 and quite possibly some time later than that.



4.2 Importance of Resources

There is considerable potential to correlate the relatively well-preserved industrial structures uncovered in the fieldwork with historic maps and documents showing the internal layout, workings and functions of the buildings at the Thames Ironworks. Therefore, the results from Limmo Peninsula are assessed as being of **moderate importance**.

It is hoped that alignment of the digitised plans with historic maps and data from the analysis of the building materials from the site will shed light on the form of the buildings within the Ironworks and their uses. Map regressions that are currently being undertaken appear to show an excellent correlation with the results of the fieldwork.

The Thames Ironworks played a hugely significant role in the development of shipbuilding into the modern era, taking orders for 144 warships and many other vessels during its existence- domestically and also for the navies of Japan, Portugal and Prussia, among others. The Thames Ironworks rose to become an internationally renowned centre for shipbuilding innovation. The HMS Warrior launched in 1860 was the World's first iron-hulled armoured frigate and also the World's largest warship at that time. The Ironworks also produced structural elements for internationally important engineering schemes such as Isambard Kingdom Brunel's Royal Albert Bridge over the Tamar, opened in the 1859.

The Ironworks was hugely important in the development of East London, being one of the driving forces, along with the Royal Victoria Dockyard, for the boom in the construction of residential settlements in the area of Canning Town. The Ironworks itself grew to be one of the largest employers in the East End of London. Its works team, set up in 1895, became the precursor to the modern day West Ham United Football Club.

It is unlikely that the underlying deposits will yield much new knowledge of the likely riverine/geological processes associated with the Thames, the Lea or any tributaries and mudflats.

4.3 *Provisional* Assessment of Results against Aims and Objectives

- It is unlikely from the information gathered that a greater understanding will be gained for the development of the local topography- the formation level of the Muck Pit only slightly intruding into the top of the fairly recent historic alluvial deposits.
- No soil samples were taken at this stage, as it is unlikely that any further understanding would be gained from that already attained during the pre-2012 Evaluation and Shafts – either of the alluvium or industrial waste. Samples of the top of the historic alluvium would not have yielded any more information on the formation processes of the silts, nor on the formation of the river topography generally. Deeper excavation may reveal deposits worth sampling, however due to the fairly shallow formation depth of the Muck Pit and associated structures; it seems unlikely that any deposits prior to those of the fairly recent historic period will be exposed.

In terms of the fieldwork objectives:



- Evidence for the Thames Ironworks was discovered and the remains of structures were recorded. In the Main Shaft the records and building material samples taken will augment those already amassed during the Evaluation phase and during the Targeted Watching Brief phase on the Auxiliary and Main Shafts. Post-excavation analysis and research will hopefully help further refine our understanding of the buildings' uses. Further analysis of the plans when aligned with historic maps may help better our understanding of the internal processes of the ironworks further.
- It is hoped that further investigation by a MOLA specialist of the bricks sampled may shed further information on the buildings uncovered.
- Further investigation of maps and other desk based resources may help to form a sequence for the demolition of the various buildings discovered.





5 Future Work and Deliverables


Future work includes a targeted watching brief on ground reduction in the northern part of the proposed Muck Pit. This is provisionally due to start in August 2012. Once the post-medieval buildings have been exposed and recorded, two evaluation trenches will be excavated to formation level to test the alluvial deposits. The remaining deliverables for the site will be reviewed by the Crossrail Project Archaeologist, Jay Carver, dependent on the results of the future fieldwork.



Fig 1 Location of targeted watching brief area and sondage

-  Targeted watching brief area
-  Sondage

0 1:1000 @ A4 50m



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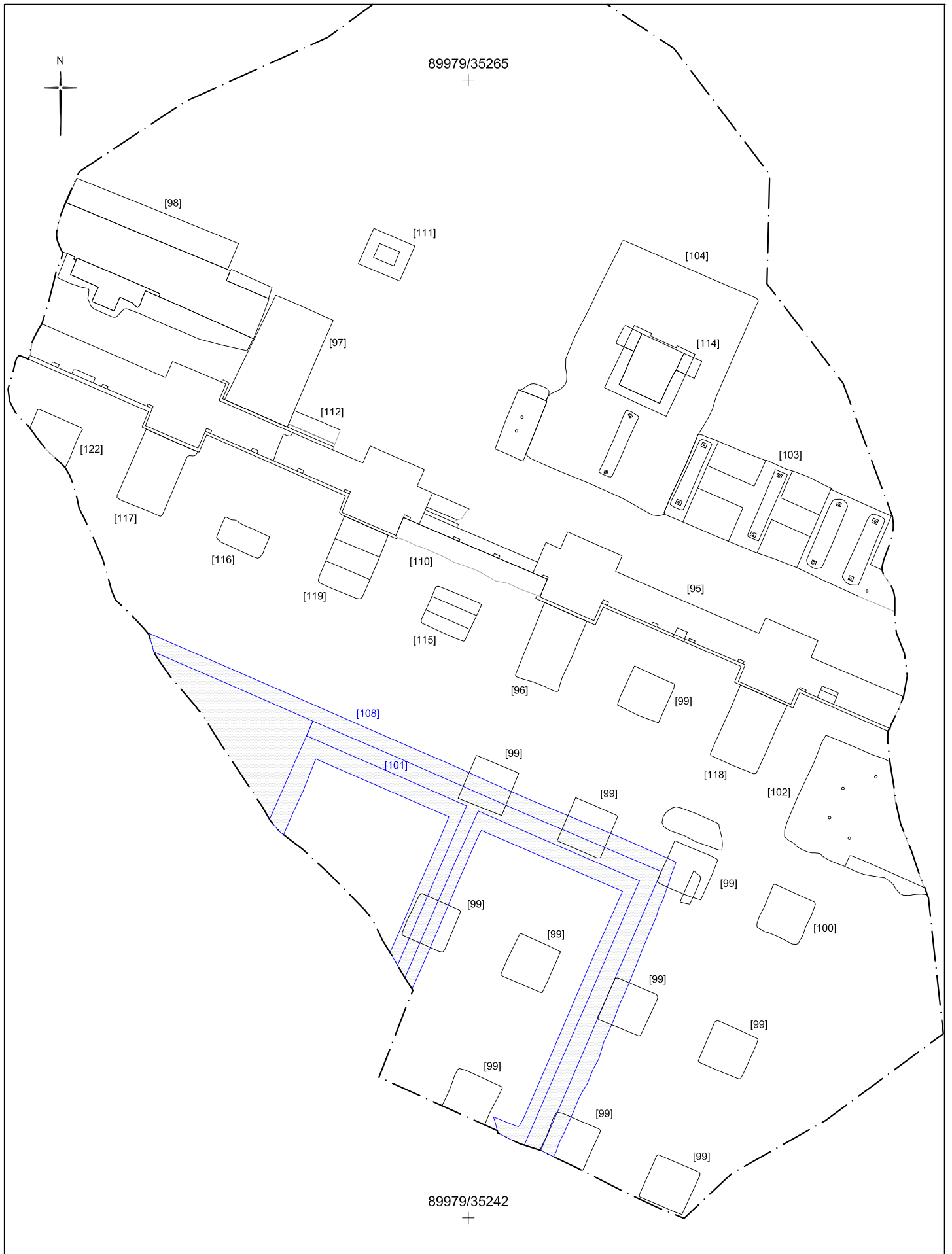





Fig 2 Plan of Instone Wharf targeted watching brief area

-  Trench edge
-  [101] Modern walls
-  [95] Archaeological features

0 1:100 @ A4 5m

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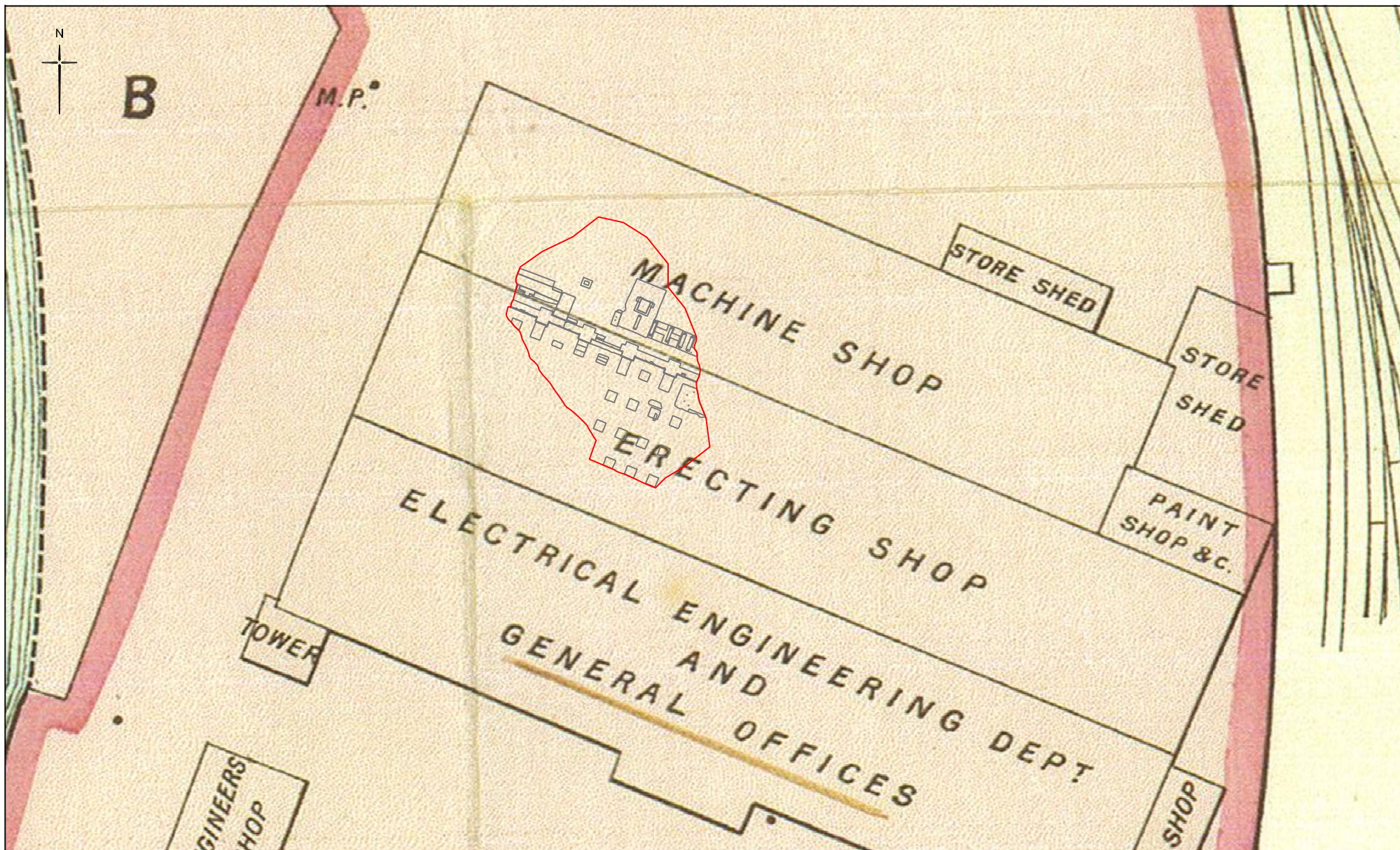


Fig 3 1913 Auction Survey with Instone Wharf targeted watching brief area overlaid

- Trench edge
- Archaeological features

0 1:500 @ A4 25m

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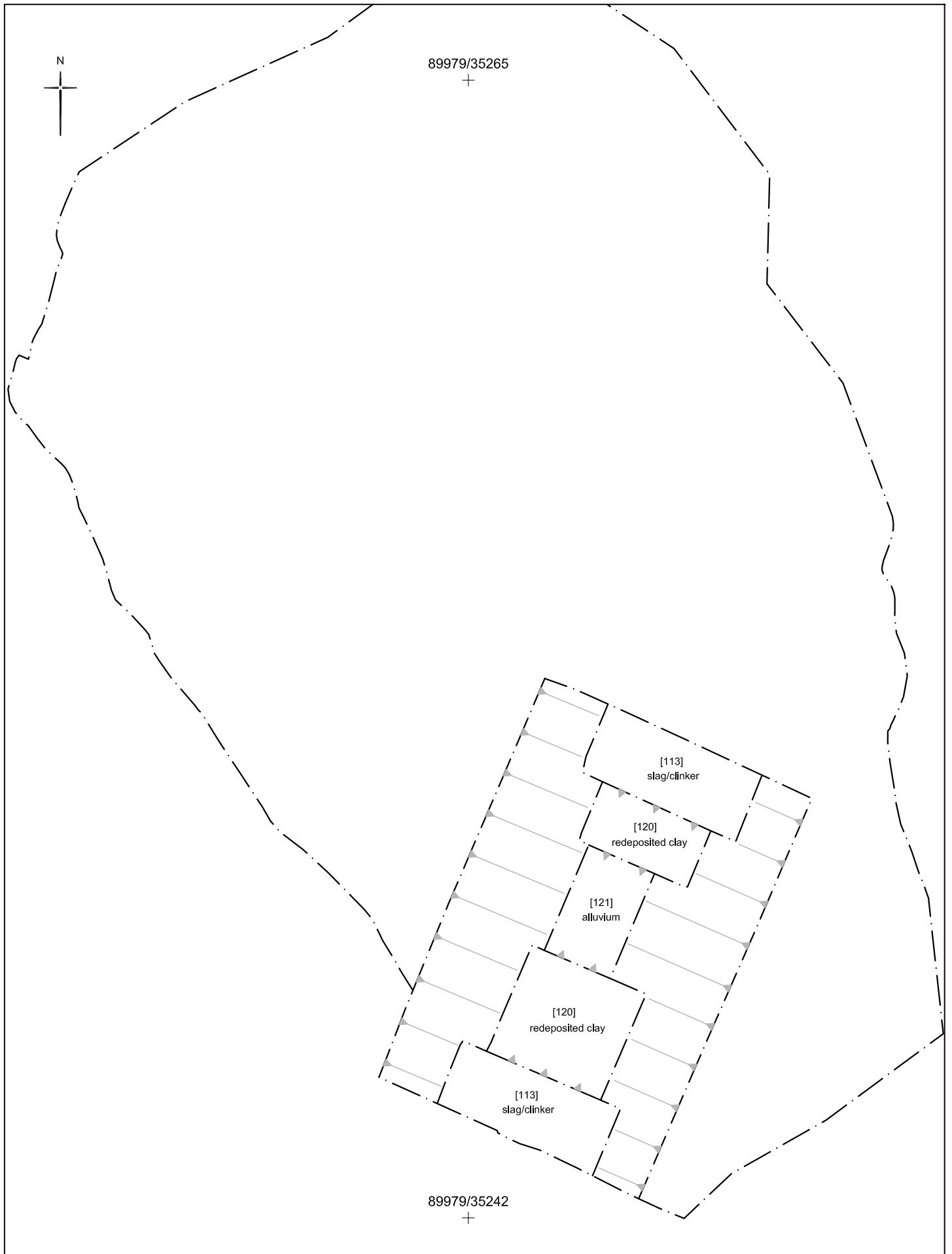





Fig 4 Sondage location within the targeted watching brief area

-  Trench edge
-  Archaeological features
-  Hachures to indicate slope

0 1:100 @ A4 5m

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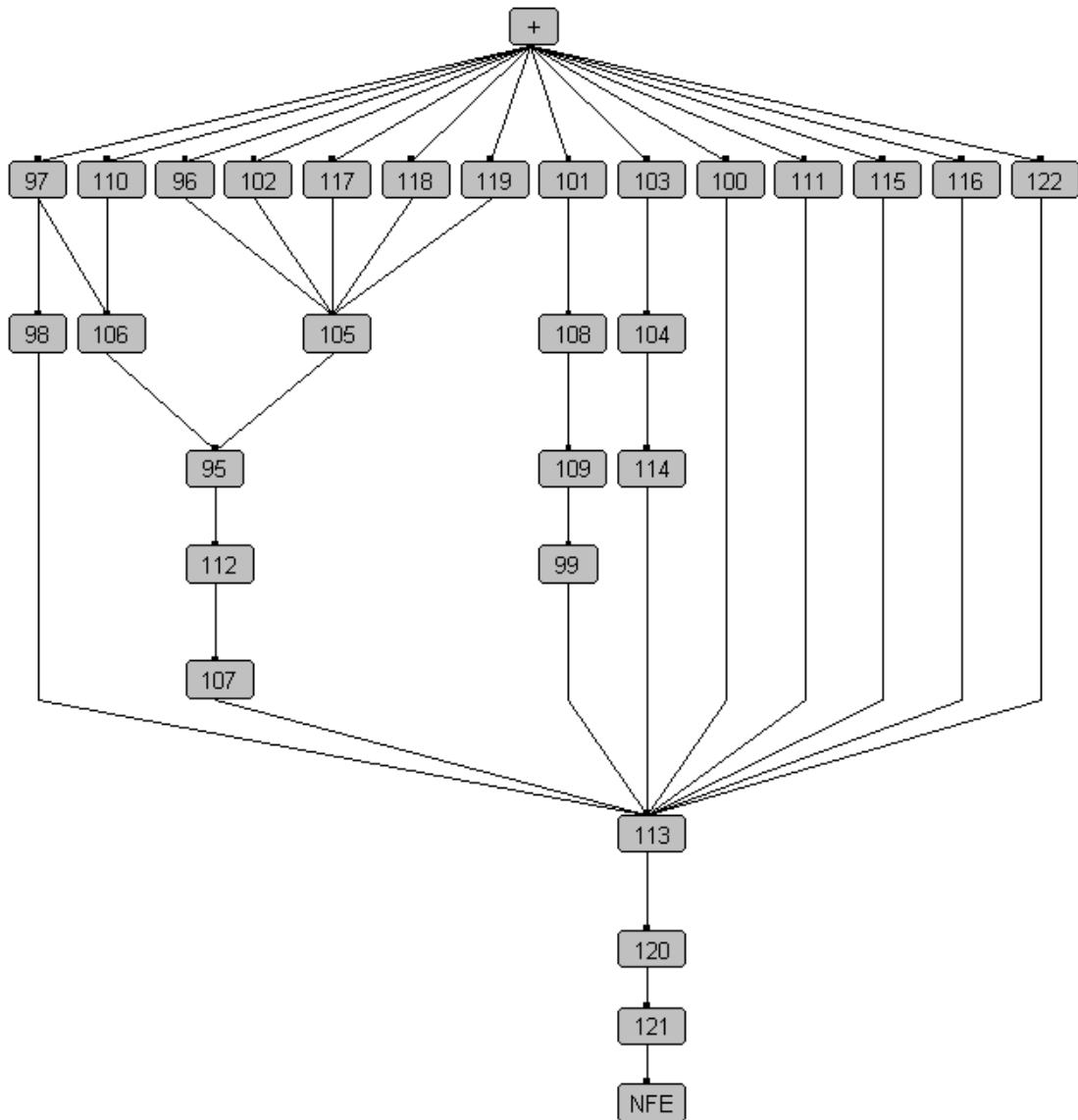


Figure 5 Stratigraphic Matrix for Instone Wharf targeted watching brief area (No further excavation below context 121).