

**Archaeological Watching Brief Report
Littlehampton East Bank Tidal Walls
Flood Defence Scheme
West Sussex**

**NGR: 50283 10131 to 50150 10290
(TV 0283 0131 to TV 0150 0290)**

**ASE Project No: 6403
Site Code: EBL 13**

**ASE Report No: 2015104
OASIS id: archaeol6-208166**



By Greg Priestley-Bell


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**By Greg Priestley-Bell
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Abstract

Archaeology South-East was commissioned by CH2M HILL Halcrow on behalf of the Environment Agency to carry out an archaeological watching brief during flood defence works on the east bank of the River Arun at Littlehampton, West Sussex (Littlehampton East Bank Tidal Walls Flood Defence Scheme).

Topsoil stripping prior to the construction of the compound and haul road and the excavation of the new wall foundation trench did not reveal any significant archaeological remains. During excavation for a septic tank and the removal of the existing river wall revealed structures and deposits relating to the 1970s construction of the existing river wall no significant archaeological remains were identified. A series of wooden stakes were recorded by total station on the foreshore in Reach 6. Historic cast iron railings around the quay wall at Ferry Wharf and on the eastern lip of the pedestrian bridge were photographically recorded.

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1.0 INTRODUCTION

1.1 Site Background

1.1.1 Archaeology South-East (ASE), the contracting division of the Centre for Applied Archaeology (CAA), Institute of Archaeology (IoA), University College London (UCL) was commissioned by CH2M HILL Halcrow on behalf of the Environment Agency (EA) to carry out an archaeological watching brief during flood defence works on the east bank of the River Arun at Littlehampton, West Sussex (*Littlehampton East Bank Tidal Walls Flood Defence Scheme*; Figure 1).

1.2.1 The scheme extends along the East Bank of the River Arun for approximately 2.5 kilometres from the harbour mouth (National Grid Reference 50283 10131) to 500m north of the A259 crossing (NGR 50150 10290). In terms of the individual reaches, the following locations are (Figure 2):

- Reach 1 – 502829, 101313 to 502771, 101587
- Reach 2 – 502771, 101587 to 502738, 101724
- Reach 3b – 502411, 102050 to 502354, 102117
- Reach 4 – 502354, 102117 to 502286, 102210
- Reach 6 (non-realigned) – 501971, 102324 to 501552, 102529
- Reach 6 Realignment – 501552, 102529 to 501526, 102906

1.2 Geology and Topography

1.2.1 The British Geological Survey (BGS) Sheet 317/332, Chichester and Bognor (solid and drift) indicates strata including blown sand, tidal river deposits, raised beach deposits and Aeolian deposits (brickearth). The underlying bedrock geology is Upper Chalk. Although made ground is not shown on the BGS sheet, development along the riverfront has given rise to quite extensive fill material.

1.3 Planning Background

1.3.1 An Environmental Statement (ES) was submitted with the planning application for the realignment sections of the scheme to the Local Planning Authority (Arun District Council) in accordance with the Town and Country Planning (EIA) Regulations 2011. A number of impacts and effects to archaeology and built heritage were identified in the ES. Following consultation on the draft ES heritage chapter with Mark Taylor (Principal Archaeologist for West Sussex County Council (WSSCC), it was confirmed that an archaeological watching brief, call out and recording of foreshore timbers was required as mitigation during the construction phase of the scheme.

1.3.2 CH2M HILL Halcrow were commissioned by the Environment Agency (EA) to provide environmental and engineering consultancy on the Littlehampton East Bank Tidal Walls Flood Defence Scheme. A Brief or outline method statement was produced by the EA's National Environment Assessment Service (NEAS) for archaeological and built heritage mitigation (2013). Based on the NEAS Brief, CH2M HILL Halcrow produced a Written Scheme of Investigation (WSI) detailing the methods to be used during the archaeological works, as required by the EA and West Sussex County Council (WSSCC) (2013). The EA Brief and CH2M HILL Halcrow WSI provided background information which is re-used in this report with due acknowledgement.

1.4 Aims and Objectives

1.4.1 The aims of the archaeological works were to:

- Identify archaeological features
- Preserve any exposed archaeological deposits and historic structures by record
- Provide a report on the results, utilising previous data to enhance knowledge on the history and development of the town and port of Littlehampton
- The specific objectives of the monitoring and historic building recording will be:
 - To provide a tool box talk to the Principal Contractor at the outset of the project
 - To provide a photographic and written record of the railings in Reach 4
 - To identify and record evidence of the development of the river frontage in the post-medieval period
 - To identify and record evidence of post-medieval development generally
 - To identify and record any archaeological features from earlier periods
 - To identify and record any artefactual material from the arisings or disturbed layers
 - To record the timber stakes in the Reach 6 Realignment foreshore area
 - To identify and record any remains of the lime kiln in Reach 6 Realignment area
 - To extrapolate information regarding local site/ land formation processes

1.5 Scope of Report

1.5.1 This report details the findings of an archaeological watching brief and targeted recording undertaken by Giles Dawkes, Dylan Hopkinson and Greg Priestley-Bell (Senior Archaeologists), and by Lauren Gibson and Michael Shapland (Archaeologists) during six site visits on 23rd October 2013, 12th November 2013, 10th April 2014, 9th June 2014, 1st September 2014 and 2nd September 2014. The project was managed by Jon Sygrave and Neil Griffin (fieldwork) and by Jim Stevenson and Dan Swift (Post-Excavation).

2.0 ARCHAEOLOGICAL BACKGROUND

A full Heritage Statement and Gazetteer is contained within Appendix E of the *Littlehampton East Bank Tidal Walls Flood Defence Scheme: Environmental Statement* (Environment Agency 2013). Below is a summary.

- 2.1.1 There are no scheduled monuments, listed buildings, registered battlefields, registered historic parks and gardens or world heritage sites within the project area.
- 2.1.2 A scheduled monument is located in the wider study area at the southern end of the project area, on the west side of the harbour mouth.
- 2.1.3 The proposed project runs through the western side of the River Road Conservation Area, which includes a large stretch of the river frontage. Two further Conservation Areas; East Street and the Seafront, lie at the eastern edges of the project area (approximately 300m to the east). There are no listed buildings within the project area. One Grade II listed building, The Cairo Club, is located to the east, near the RNLI station. There are a further two buildings, which although not listed, are important locally as rare local survivals of post-medieval buildings on the east bank which form part of the tidal walls. These are 47 River Road, an early flint and brick warehouse, and an adjoining warehouse of the mid-19th century, which currently house Riverside Autos. These properties are currently being redeveloped for residential use.
- 2.1.4 A range of further archaeological monuments, historic buildings and find spots were also identified. Some of these (the site of a swing bridge, a harbour and a windmill) are located along the line of the defences and may have associated buried remains. In addition, there is potential for unrecorded remains such as barges within the inter-tidal area.
- 2.1.5 Littlehampton has also been subject to an Extensive Urban Survey (Harris 2009). The project area passes through four historic urban character types: The Station, River Road, New Road and The Seafront. The Survey also evaluates the historic environment value according to a five-point scale with 1 representing lowest value through to 5, representing highest value. The Station, New Road and The Seafront have all been assigned a value of 1.

3.0 ARCHAEOLOGICAL METHODOLOGY

3.1 Fieldwork Methodology

3.1.1 Summary

The required works as detailed in the WSI included:

- a toolbox talk for contractors, to incorporate all the archaeological works;
- a targeted watching brief at Reaches 1 and 2;
- a photographic survey of the iron railings in Reach 4 (to include a photographic record and understanding of context);
- recording and assessment of timbers on the foreshore at Reach 6 and 6b;
- monitoring at Reach 6b;
- monitoring on a 'call out' basis of Reaches 3 and 6
- production of a post-excavation assessment report and a publication

Toolbox talk

- 3.1.2 It was agreed that no toolbox talk was to be given at the outset of the project (Autumn 2013) as the works would not be impacting on potential archaeological deposits until the following spring. It was intended that the toolbox talk be given later in the project closer to the time when works in Reach 6 were to be undertaken. However, when the works in Reach 6 commenced it was apparent that the impact would be minimal and that no such contractor briefing would be required.

Watching Brief at Reaches 1 and 2 (Figure 2)

- 3.1.3 Reaches 1 and 2 were sheet piled directly in front of the existing river wall, and the intervening space was backfilled. As this process did not involve any excavation, no archaeological monitoring was required.

Photographic recording of the iron railings in Reach 4 (Figure 7)

- 3.1.4 There were historic cast iron railings around the quay wall at Ferry Wharf and on the eastern lip of the pedestrian bridge. These lay within the River Road Conservation Area and would be removed and re-used subject to feasibility. A photographic survey of the railings was carried out prior to their removal in order to create an archive of the features. The photographic record was accompanied by a description of the railings and an assessment of their context.

Recording and assessment of timbers on the foreshore at Reach 6 and 6b (Figure 8)

- 3.1.5 A number of timbers interpreted as a series of wooden stakes probably forming part of a landing stage associated with the old quay have been identified on the foreshore in Reach 6. These were left *in-situ* and were not affected by works elsewhere on the foreshore. They extended across both the Reach 6 Realignment and Reach 6 non-realigned sections of the scheme. These had never been accurately located or recorded.
- 3.1.6 It was agreed with Mark Taylor (WSCC) that these timbers would be subject to a preliminary assessment regarding likely age, wood type, condition and context. The aim of this was to assess the potential value, significance and interpretation of the

timbers and identify possible avenues for future assessment i.e. dendrochronology. The timbers were located using a total station. The assessment of the timbers was made from the photographs and site records created by the archaeologist on site. Recovery of the timbers from the foreshore was not permitted.

Archaeological monitoring at Reach 6b (Figures 4 & 5)

- 3.1.7 The construction works at Reach 6b included a realignment of the flood defence bank involving the construction of a new bank further inland, followed by the removal of the current bank. Initially it was assumed that the excavation depth would vary between 0.5m and 1.4m under the new embankment; however as the ground level was below that defined as salt marsh, only topsoil stripping was carried out.
- 3.1.8 Once the topsoil had been stripped an archaeologist inspected the subsoil for archaeological features and deposits.

Archaeological monitoring on a 'call out' basis

- 3.1.9 In several areas along the scheme (Reaches 3, 4 and 6) there were areas of archaeological potential where the impact from construction activities was considered to be limited and where the proposed construction methodology was restricted spatially. In these locations archaeological monitoring was conducted on a 'call out' basis. No call outs received for works in Reaches 3 or 4.
- 3.1.10 An archaeological monitor was called out when required as has been reported upon (see below). However, the works proved to be of significantly less impact than was first envisaged, allowing the level of archaeological monitoring to be reduced. ASE were in regular contact with site management to ensure that works with the potential to impact upon archaeological deposits could be monitored.

3.2 Recording standards

- 3.2.1 The archaeological works were recorded to standards of current best practice and the Institute for Archaeologists standard and guidance documentation for archaeological watching brief (IfA 2008a). Where archaeological deposits were encountered they were planned and recorded in accordance with the nominated Archaeological Contractor's recording manual. Safe working practices overrode archaeological considerations at all time.
- 3.2.2 Provision was made for the following hand-excavation sampling strategy to be employed on archaeological features:

Feature type sample excavation minimum % notes

- Pits/Postholes 50% (half sectioned) should pit be less than 1m in diameter 25% (quarter section) minimum should they exceed 1m
- Linears (ditches/ gullies) 10% (of length) as a minimum Linear intersections 50% To obtain key relationship information
- Hearths, Ovens, kilns, furnaces 100% Sample excavation to obtain dating material
- Floors and Structural elements 25% Sample excavation to determine date only

- Burials/cremations 100% Subject to Police / Home Office /Ministry of Justice approval

3.2.3 Archaeological recording comprised, as a minimum, the recording of individual contexts on appropriate *pro-forma* sheets; plans at a 1:50 scale; planning and section drawings of appropriate single contexts and features (at 1:20 and 1:10 scales, as deemed commensurate with the subject); photographs and other appropriate drawn and written records. Representative measured drawings of the side of trench excavations were prepared as appropriate, showing the sequences and depths of the general deposits.

3.3 Fieldwork Constraints

Septic tank excavation (Reach 5)

3.3.1 Due to health and safety considerations, the excavation could not be entered or closely approached and in consequence no direct measurements were taken. No close examination of clean deposits was possible and there was no opportunity to properly assess the suitability of exposed deposits for environmental sampling.

Topsoil stripping (Reach 6b)

3.3.2 An area measuring c. 50m x 40m had been stripped prior to the arrival of the ASE monitor and had been tracked over, so as to make the identification of any potential archaeological remains more difficult.

Excavation of Tidal Wall Foundation Trench (Reach 6)

3.3.3 The narrowness (0.60m) of the trench did not allow close examination of the revealed deposits.

3.4 The Site Archive

3.4.1 The site archive is currently held at the offices of ASE and will be deposited at a local museum. The contents of the archive are tabulated below (Table 1).

Number of Contexts	17
No. of files/paper record	1
Plan and sections sheets	1
Bulk Samples	nil
Photographs	86 digital, 25 B+W, 25 CS.
Bulk finds	1
Registered finds	nil
Environmental flots/residue	nil

Table 1: Quantification of site archive

4.0 RESULTS

4.1 Site visit 23rd October 2013

Reach 5 – Septic Tank Excavation (Figure 3)

- 4.1.1 The excavation of a septic tank to serve the site compound was monitored. The excavation measured 3.6m x 5m and was approximately 3.3m deep. The west facing section of the excavation was recorded.
- 4.1.2 The recorded sequence of deposits was: [15] consisting of light/mid greyish yellow silty clay; river silt, [14] consisting of very dark blackish grey silt; a timber pile [13] measuring at least 1m high and c. 0.25 square; a dump deposit [12] consisting of mid whitish grey silt with 60% chalk fragments; a dump deposit [09] consisting of mid yellowish grey silty clay; a dump deposit [08] consisting of very dark blackish grey silty clay that produced a fragment of roof tile; a dump deposit [06] consisting of very light greyish white silt with 90% chalk fragments; a dump deposit [05] consisting of variegated mid grey/light whitish grey silt with 30% chalk fragments; a dump deposit [04] consisting of mid yellowish brown silty clay; a mixed deposit [03] consisting of mid/dark grey/brown silty sandy clay with occasional timber fragments. A steel tie rod [20], angled downwards towards the north was visible in the section.

Context	Type	Description	Max Length m	Max Width m	Average Thickness m	Height m AOD (approx)
01	Deposit	Hard-standing	5	3.6	0.28	0.72 to 1.00
02	Deposit	Hard-standing base	5	3.6	0.40	0.32 to 0.72
03	Mixed deposit	Made ground	5	3.6	1.2	-0.88 to 0.32
04	Deposit	Dump deposit	1.2	3?	0.40	-1.28 to -0.88
05	Deposit	Dump deposit	0.8	3?	0.80	-2.08 to -1.28
06	Deposit	Dump deposit	0.8	3?	1.2	-3.28 to -2.08
08	Deposit	Dump deposit	3?	3?	0.80	-3.28 to -2.00
09	Deposit	Dump deposit?	2?	3?	1.0	-3.00 to -2.00
12	Deposit	Dump deposit	2	3.6	0.10	-2.98 to -2.88
13	Timber	Pile	1.4+	0.25		-3.28 to -0.80
14	Deposit	River silt?	2.4	3.6	0.15	-3.13 to -2.98
15	Deposit	Natural?	2.4+	3.6	0.15+	-2.25
20	Structure	Steel tie rod	5	Na		

Table 2: Septic tank excavation, list of recorded contexts

4.2 Site visit 12th November 2013

Reach 6b – The Foreshore Timbers (Figure 8)

- 4.2.1 The purpose of the visit was to survey and assess the timbers on the foreshore in Reach 6, in accordance with the WSI (2013 CH2MHILL). A full film and digital photographic record was made of the timbers, and the location of each timber was surveyed from the riverbank using a total station, although additional possible timbers visible below the water level could not be recorded.
- 4.2.2 The timbers are located in an area marked ‘saltings’ on the 1913 and 1932 OS maps, meaning an area of salt marsh. They extend from the masonry slipway at 501499, 102735 (TQ 01499 02735) to the bend in the river adjacent to the A259 road bridge at 501562, 102433 (TQ 01562, 02433), and consist of a central cluster of posts – a possible structure – and revetments with linear alignments of additional posts extending to the north and south over a total distance of c. 320 metres.
- 4.2.3 The central structure measures c. 7.8 m north/south by 5.7 m east/west, and consists of 22 regularly-spaced posts spaced 1.5-1.75 m apart deployed into four rows and surviving to a height of no more than 0.3 m. Where visible, the majority of these posts are circular in section and 150-200 mm in diameter. Where these posts front onto the present low tide line there lies the remains of an associated horizontal revetment board; a second length of broken plank approximately 250 mm in diameter protrudes from the western side of the structure, indicating the former presence of further revetment planks. An additional row of three irregularly-spaced posts surviving up to 0.5 m high stand 7.2 m inland of the structure (12.8 m from the present low tide line) in east/west alignment with it. These may represent the original rear extent of the structure, since largely buried by the encroaching foreshore or salvaged for other uses.
- 4.2.4 An area of cobblestones is associated with the southern row of posts, c. 100 m south of the central structure, which continues for a further 100 m towards the A259 road bridge. The cobbles are closely packed and appear to have been laid onto regular mats c. 12 metres long by 5 metres wide, and are presumably of relatively modern date.

Reach 4 – The Iron Railings (Figure 7)

- 4.2.5 The purpose of the visit was to carry out a photographic survey of the historic railings in Reach 4 in accordance with the WSI (2013 CH2MHILL). A full film and digital photographic record was made of the railings.
- 4.2.6 The railings are wholly of cast iron manufacture, and consist of square-section rods which meet astragals topped by paired volutes halfway up their length. Above, the rods bulge into octagonal darts and are cylindrical in section thereafter, with spear pommel finials trailing stiff acanthus-leaf foliage. The rods are joined at base and top by twin bands, the lower containing a frieze of geometric diamonds and the upper of lobed rosette paterae. They are interrupted by a gate midway along their length, which has square posts with panels bearing drops of three inverted husks, topped by convex finials bearing simple palmettes. The gates themselves are modern.
- 4.2.7 The railings are leaded into a simple bevelled stone plinth which has been replaced by concrete to the southeast of the gate, which has subsumed the lower part of the

railings. The plinth rests in turn upon a battered brick retaining wall of red stretcher bond red banded with blue Staffordshire brick.

- 4.2.8 The railings terminate to the west in a brick pedestal with a bevelled plinth, and to the south-east in a low modern brick wall with brick coping. In both cases the railings articulate awkwardly with these features: an indication of their original termination is given by the railings to the north-west adjoining the Arun View public house. These railings terminate adjacent to the bridge in a panelled brick pedestal with two orders of bevelled limestone coping topped by the elaborate cast iron base of a gaslight. This would have been the original arrangement flanking both sides of the bridge.

4.3 Site visit 10th April 2014

Reach 6b – Topsoil Strip (Figure 4)

- 4.3.1 Topsoil stripping of the compound and haul road area was monitored. An area measuring c. 50m x 40m had been stripped prior to the arrival of the ASE monitor and had been tracked over. No significant archaeological features or finds were identified or recovered.

4.4 Site visit 9th June 2014

Reach 6 – Excavation of Tidal Wall Foundation Trench (Figure 5)

- 4.4.1 The excavation of the tidal wall foundation trench was monitored. The trench measured 0.60m wide and approximately 2.1m deep. A sample of the west facing section of the excavation was recorded.
- 4.4.2 The recorded sequence of deposits was: natural [16] consisting of chalk; made ground [17] consisting of grey ash with modern metalwork; made ground [18] consisting of mid brown silt; [19] topsoil of dark brown silt.

Context	Type	Description	Max Length m	Max Width m	Deposit Thickness m (average)	Height m AOD m (approx)
19	Deposit	Topsoil		0.60	0.20	0.98-1.00
18	Mixed deposit	Made ground		0.60	1.50	-0.52 to 0.98
17	Deposit	Made ground		0.60	0.40	-0.92 to -0.52
16	Deposit	Natural		0.60+	Na	

Table 3: Tidal wall trench, list of recorded contexts

4.5 Site visits 1st and 2nd September 2014

Reach 6 – Removal of modern Tidal Wall and ground reduction (Figure 6)

- 4.5.1 The 1970s tidal wall was removed to expose an underlying deposit which consisted of mixed material including silts, sands, chalk, clay and alluvium. Much modern debris from the 1970s tidal wall was compressed into the top of the underlying deposit. In addition, the wetland immediately to the east of the modern tidal wall was reduced. No significant archaeological features or finds were identified or recovered. After consultation, archaeological monitoring of this area ceased.

5.0 THE FINDS

5.1 Summary

5.1.1 Only two finds of CBM were recovered during the work. A wood sample of a timber pile was also recovered.

5.2 Ceramic Building Material (CBM) by Trista Clifford

5.2.1 Context [08] contained two peg tile fragments weighing a total of 448g, possibly from the same tile. The fabric is moderately sandy with moderate medium to coarse red iron oxides and sparse to moderate calcareous inclusions and sparse yellow streaks. The largest fragment exhibits two square nail holes, one of which contains the corroded remains of an iron nail stem. The nail holes measure c. 9mm x 9mm. The complete width of the tile is 160mm and it measures 11mm thick. There are patches of mortar on the reverse. The tile is of mid- to late 16th-century or later date.

6.0 DISCUSSION AND CONCLUSIONS

6.1 Summary of results

6.1.1 The works within the scheme proved to have significantly less impact upon potential archaeological deposits than was originally envisaged. Reaches 1 and 2 were sheet piled directly in front of the existing river wall, and the intervening space was backfilled. As this process did not involve any excavation, no archaeological monitoring was required. With the exception of the historic iron railings in Reach 4 (see below), no deposits with an archaeological potential were impacted upon in Reaches 3 and 4; no call outs were received. In Reach 5 the only groundworks with archaeological potential, the excavation of a pit to accommodate a septic tank, were monitored (see below). Groundworks in Reach 6 were much reduced due to the ground level below the new embankment not having to be reduced. Consequently the only excavations with potential in Reach 6 comprised topsoil stripping and the cutting of a narrow foundation trench for the new tidal wall. Although neither groundwork operations identified any archaeological remains of note, the recording of the foreshore timbers in Reach 6b has indicated some significant potential (see below).

6.2 Reach 5 – Septic Tank Excavation

6.2.1 With the exceptions of [12], [14] and [15] (natural), all the deposits recorded in the section, almost certainly related to the construction of the 1970s tidal wall. Dump deposits [04], [05], [06], [08] and [09] were intended to raise the ground level prior to the construction of the new wall. Timber pile [13] clearly appears to have been driven through deposit [06] and would have been intended to stabilise the embanked material, while the steel tie rod [20] would have held the new wall in position and prevented any movement towards the river.

6.2.2 Only deposits [12] and [14] seem to predate the 1970s construction. Deposit [12] perhaps represented chalk rubble, put down on the surface of the river mud to allow access on to the foreshore. Deposit [14] was probably a thin layer of river alluvium lying on an area of apparently scoured natural. An OS map of the 1960s, immediately prior to the construction of the new wall, certainly seems to show erosion of the river bank at this location.

6.3 Reach 6b – The Foreshore Timbers

6.3.1 The timbers are too far from Littlehampton's harbour infrastructure to be the remains of an early quay, and the area is not served by early roads or buildings. The timbers may instead be interpreted as piles relating to early phase of the existing flood defences. Earthwork defences sometimes incorporate wooden piles to provide additional stability, particularly in areas of uncertain or marshy ground. These piles can lie in the core of the earthwork, or its 'toe' (the base of the earthwork fronting the water), where they would commonly hold bundles of brushwood faggots in place ('pitching') as protection against erosion (Allen 1997; English Heritage 2011). The southern row of posts may therefore represent 'toe' posts and the northern 'core' piles, which would account for their differing alignment and distance from the river. Alternatively, the 'toe' posts may be associated with 'warping': the erection of a low fence to trap sediment and so raise the level of the land prior to reclamation (English Heritage 2011). Stones were often used to further strengthen earthwork defences, which may also be represented by the concentrations of stones across the site.

- 6.3.2 The central timber structure can be interpreted as an outfall – known as a ‘gout’ – which would have allowed freshwater to escape from the reclaimed land into the river. Its original form is difficult to establish, but it may have had a flap valve which was closed by the rising tide, or possibly a manually-operated gate (Allen 1997). The gout lies on the line of the watercourse visible on early OS maps of the site, which has since been diverted beneath the A259 to a modern sluice 170 m to the south.
- 6.3.3 The flood defences along Reach 6b, where the greatest concentration of timbers is found, has clearly been set back from its original alignment for a distance of 260 m. Its original alignment is preserved both by the linear rows of piles to the north and south of the presumed gout, and by a relict stretch of earth bank visible on the first edition 1870 map of the site (Figure 2), but not thereafter. Such rebuilding commonly occurs when the original wall is breached, which may have happened where the presumed gout created a weak point in the earth and timber defences. Where a breach occurs the tide can have a disproportionately powerful erosive effect which slackens as the sea fans out over the reclaimed land. Repairs will often encircle the breach up to the limit of the inundation rather than attempting to plug the scour hole directly, leading to a set-back earthen bank (Allen 1997). One consequence of this type of repair is that the inundated area can conceal evidence for land use prior to the breach (Allen 1997, 16), which should be taken into account during the proposed works in this area.
- 6.3.4 The earthworks pre-date the OS draft map of the area 1806-7, and since they had already been repaired and re-aligned at least once prior to this date, they are likely to be earlier still. Indeed, this line of flood defences appears to represent the second phase of foreshore reclamation in the area, the first being a bank c. 140 m inland which is visible on the 1806-7 OS map and is respected by early field boundaries implying that it is earlier still. The 1788 Yeakell and Gardner map depicts flood defences in the area with no deviation shown, indicating that the timber piles date to before this date. The re-alignment of the defences presumably therefore dates to c. 1800, although the 1788 map is of insufficient detail for this to be certain.
- 6.3.5 Flood defences of this type are known in Britain as early as the 1st century AD, but coastal and estuarine reclamation occurred at different times according to local circumstances (Rippon 2000a; English Heritage 2011). Along the south coast the reclamation of Romney Marsh during the Anglo-Saxon period is well understood, for example, but it did not occur at Pevensey until after the Norman Conquest, and at Langstone Harbour – 30 km west of the site – until the 18th century (Rippon 2000a; Allen & Gardiner 2000, 81-2). Powerful monasteries appear to have taken a lead in the process throughout the medieval period, meaning that areas with smaller or more fragmented ecclesiastical estates experienced less activity at this time (Rippon 2000a).
- 6.3.6 The flood defences and associated timbers along Reach 6 are of unknown date. Their relative date can be gleaned through elevational differences across the line of the earthworks, which relies on the fact that active salt marsh will increase in height on the riverward of the bank due to sedimentation, exceeding the height of land behind. The greater this elevational difference, the earlier the reclamation (English Heritage 2011). Analysis of the extant timbers for tool marks and jointing techniques can indicate whether they are of medieval or later date, but accurate dating could best be obtained through dendrochronology. This can best be applied if the timbers are oak, but it can also obtain results from ash, pine, beech and elm. High-precision radiocarbon analysis may also be considered (English Heritage 2010, 23-5).

6.3.7 The foreshore timbers are interpreted here as part of the original flood defences in this area, which were re-aligned along Reach 6b due to a suggested breach and inundation. They can therefore be related to the economic development of Littlehampton and the greater demands made by its rising population – or burgeoning trade – on available agricultural land, meaning that marginal land such as that reclaimed from the River Arun became viable for exploitation (Rippon 2000a; 2000b). Cartographic evidence confirms the flood defences, and consequently this episode of land reclamation, relates to the period before 1788, but a proper assessment of their significance will depend upon obtaining an accurate date. In crude terms, the earlier the date of the timbers the greater their significance, since the economic development of Littlehampton can be interpreted accordingly.

6.4 Reach 4 – The Iron Railings

6.4.1 The railings were erected in association with the adjacent footbridge over the River Arun, which replaced a ferry crossing in this location in c. 1900. This was a swing bridge with a toll, so the railings would presumably have originally incorporated a gate to prevent the unwary from crossing when the bridge had swung, whilst being sufficiently ornamental to justify the new charge for foot traffic. They do not survive on the south-west bank of the river, but will be retained along the stretch to the Arun View public house.

6.5 Original Aims and Objectives

6.5.1 Perhaps as a result of the groundworks having a much reduced impact upon potential archaeological deposits than was originally envisaged, no archaeological features or finds relating to periods before the post-medieval were identified. No new evidence regarding the post-medieval development of the town and port of Littlehampton has been uncovered, and no trace of the lime kiln recorded on historic maps in the north of Reach 6b was found. However the recording and consideration of the foreshore timbers in Reach 6b has highlighted the potential for further investigation of these remains outside the scope of the current work.

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HER Summary

Site Code					
Identification Name and Address	The Littlehampton East Bank Tidal Walls Flood Defence Scheme, Littlehampton, West Sussex				
County, District &/or Borough	West Sussex				
OS Grid Refs.	50283 10131 to 50150 10290				
Geology					
Arch. South-East Project Number	6403				
Type of Fieldwork			Watching Brief X		
Type of Site				Riverside	
Dates of Fieldwork			23/10/13, 12/11/2013, 10/4/2014, 9/6/2014, 1,2/9/2014		
Sponsor/Client	CH2M HILL Halcrow				
Project Manager	Jon Sygrave and Neil Griffin				
Project Supervisor	Giles Dawkes, Dylan Hopkinson and Greg Priestley-Bell				
Period Summary					
				Modern	
Summary	<p>Archaeology South-East was commissioned by CH2M HILL Halcrow on behalf of the Environment Agency to carry out an archaeological watching brief during flood defence works on the east bank of the River Arun at Littlehampton, West Sussex (Littlehampton East Bank Tidal Walls Flood Defence Scheme).</p> <p>Topsoil stripping prior to the construction of the compound and haul road and the excavation of the new wall foundation trench did not reveal any significant archaeological remains. During excavation for a septic tank and the removal of the existing river wall revealed structures and deposits relating to the 1970s construction of the existing river wall no significant archaeological remains were identified. A series of wooden stakes were recorded by total station on the foreshore in Reach 6. Historic cast iron railings around the quay wall at Ferry Wharf and on the eastern lip of the pedestrian bridge were photographically recorded.</p>				

OASIS Form

OASIS ID: archaeol6-208166

Project details

Project name	Littlehampton East Bank Tidal Walls Flood Defence Scheme
Short description of the project	Archaeology South-East was commissioned by CH2M HILL Halcrow on behalf of the Environment Agency to carry out an archaeological watching brief during flood defence works on the east bank of the River Arun at Littlehampton, West Sussex (Littlehampton East Bank Tidal Walls Flood Defence Scheme). Topsoil stripping prior to the construction of the compound and haul road and the excavation of the new wall foundation trench did not reveal any significant archaeological remains. During excavation for a septic tank and the removal of the existing river wall revealed structures and deposits relating to the 1970s construction of the existing river wall no significant archaeological remains were identified. A series of wooden stakes were recorded by total station on the foreshore in Reach 6. Historic cast iron railings around the quay wall at Ferry Wharf and on the eastern lip of the pedestrian bridge were photographically recorded.
Project dates	Start: 23-10-2013 End: 02-09-2014
Previous/future work	Yes / Not known
Any associated project reference codes	6403 - Contracting Unit No.
Type of project	Recording project
Site status	None
Current Land use	Coastland 2 - Inter-tidal
Monument type	NONE None
Significant Finds	CBM Uncertain
Investigation type	"Part Survey","Watching Brief"
Prompt	Environmental Assessment regulations Schedule 1 projects (Obligatory)

Project location

Country	England
Site location	WEST SUSSEX ARUN LITTLEHAMPTON Bridge Road, Littlehampton, West Sussex
Study area	2.50 Kilometres
Site coordinates	TV 0283 0131 49.9025033625 -0.567902066096 49 54 09 N 000 34 04 W Line
Site coordinates	TV 0150 0290 49.9170284706 -0.586000752091 49 55 01 N 000 35 09 W Line
Height OD / Depth	Min: -2.30m Max: 1.00m

Project creators

Name of Organisation	Archaeology South East
Project brief originator	Environment Agency
Project design originator	Halcrow Group Limited
Project director/manager	Jon Sygrave
Project director/manager	Neil Griffin/Jon Sygrave
Project supervisor	Greg Priestley-Bell
Project supervisor	Dylan Hopkinson
Project supervisor	Giles Dawkes
Type of sponsor/funding body	Environment Agency
Name of sponsor/funding body	Halcrow Group

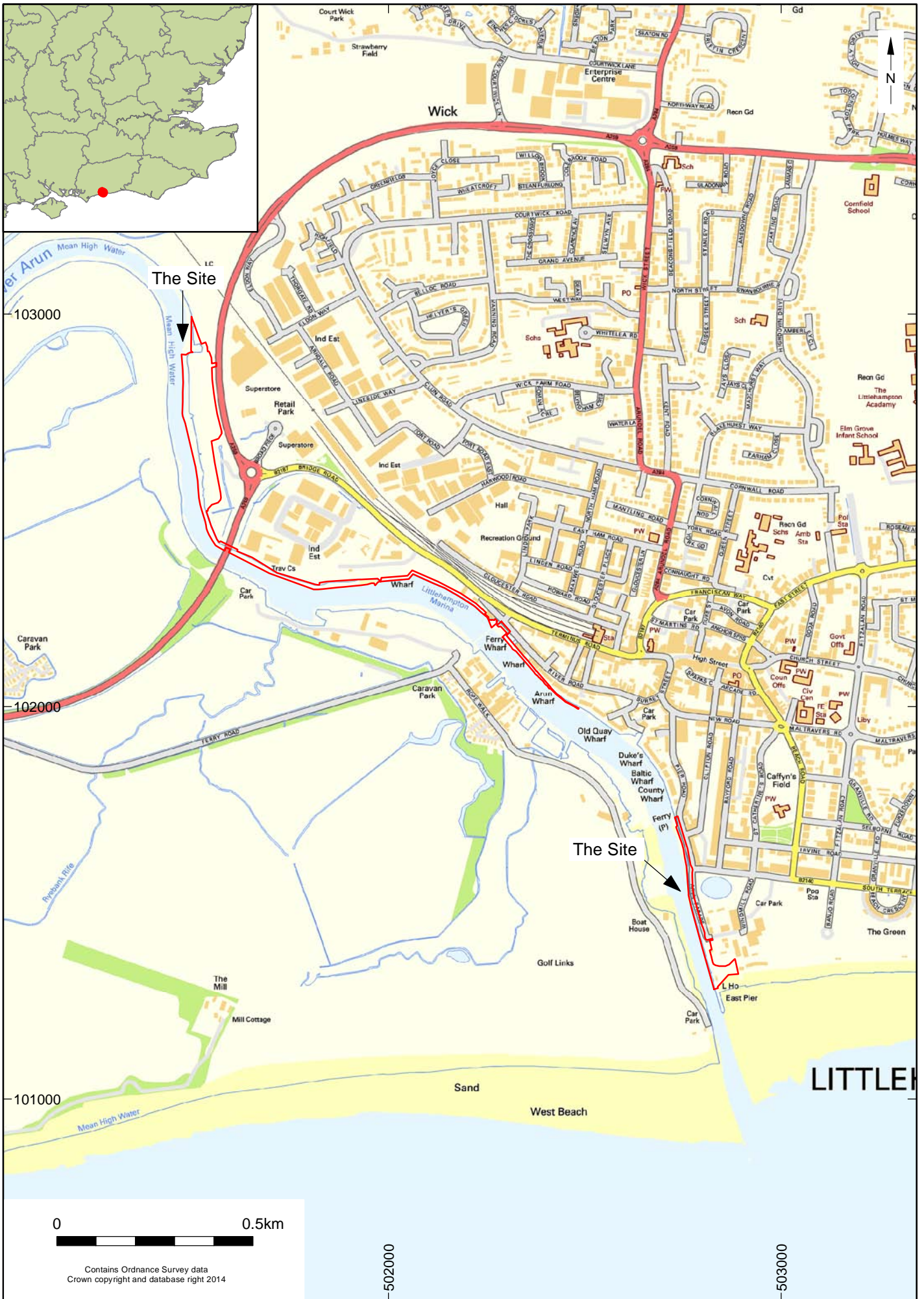
Project archives

Physical Archive recipient	local museum
Physical Contents	"Ceramics"
Digital Archive recipient	local museum
Digital Contents	"Survey"
Digital Media available	"Images raster / digital photography","Survey"
Paper Archive recipient	local museum
Paper Contents	"Stratigraphic","Survey"
Paper Media available	"Context sheet","Photograph","Plan","Report","Section","Survey "

Project bibliography 1

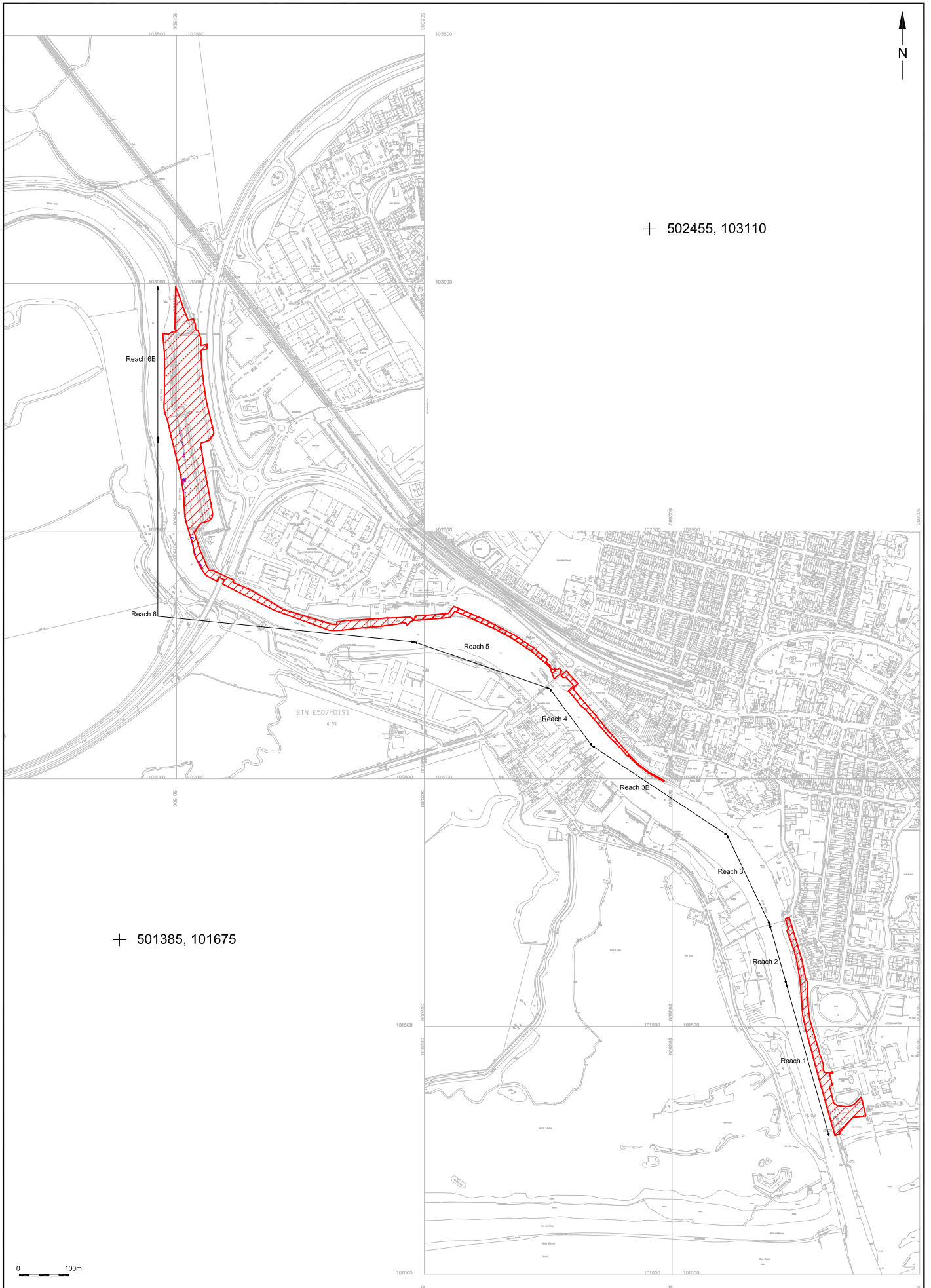
Publication type	Grey literature (unpublished document/manuscript)
Title	An Archaeological watching brief on land on the Littlehampton East Bank Tidal Walls Flood Defence Scheme, West Sussex
Author(s)/Editor(s)	Greg Priestley-bell
Other bibliographic details	Report no 2015104
Date	2015

Issuer or publisher	Archaeology South-East
Place of issue or publication	Portslade
Description	Pamphlet
Entered by	Greg Priestley-Bell (gregpbell@btinternet.com)
Entered on	6 April 2015

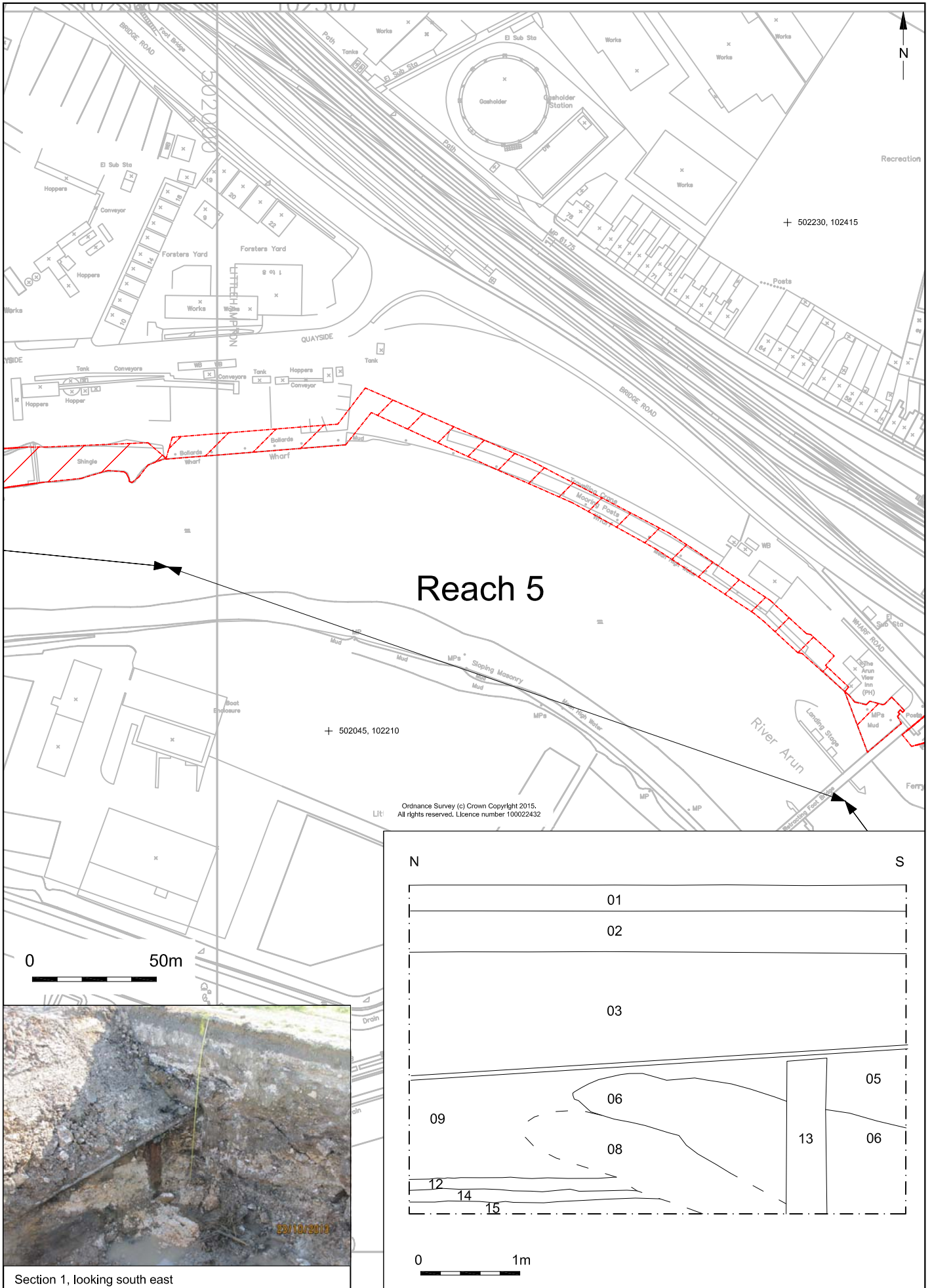


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Project Ref: 6403	April 2015	Site location		
Report Ref: 2015104	Drawn by: NG			



© Archaeology South-East		Littlehampton East Bank Tidal Walls	Fig. 2
Project Ref: 6403	04 - 2015	Plan of worked area	
Report Ref: 2015104	Drawn by: NG		

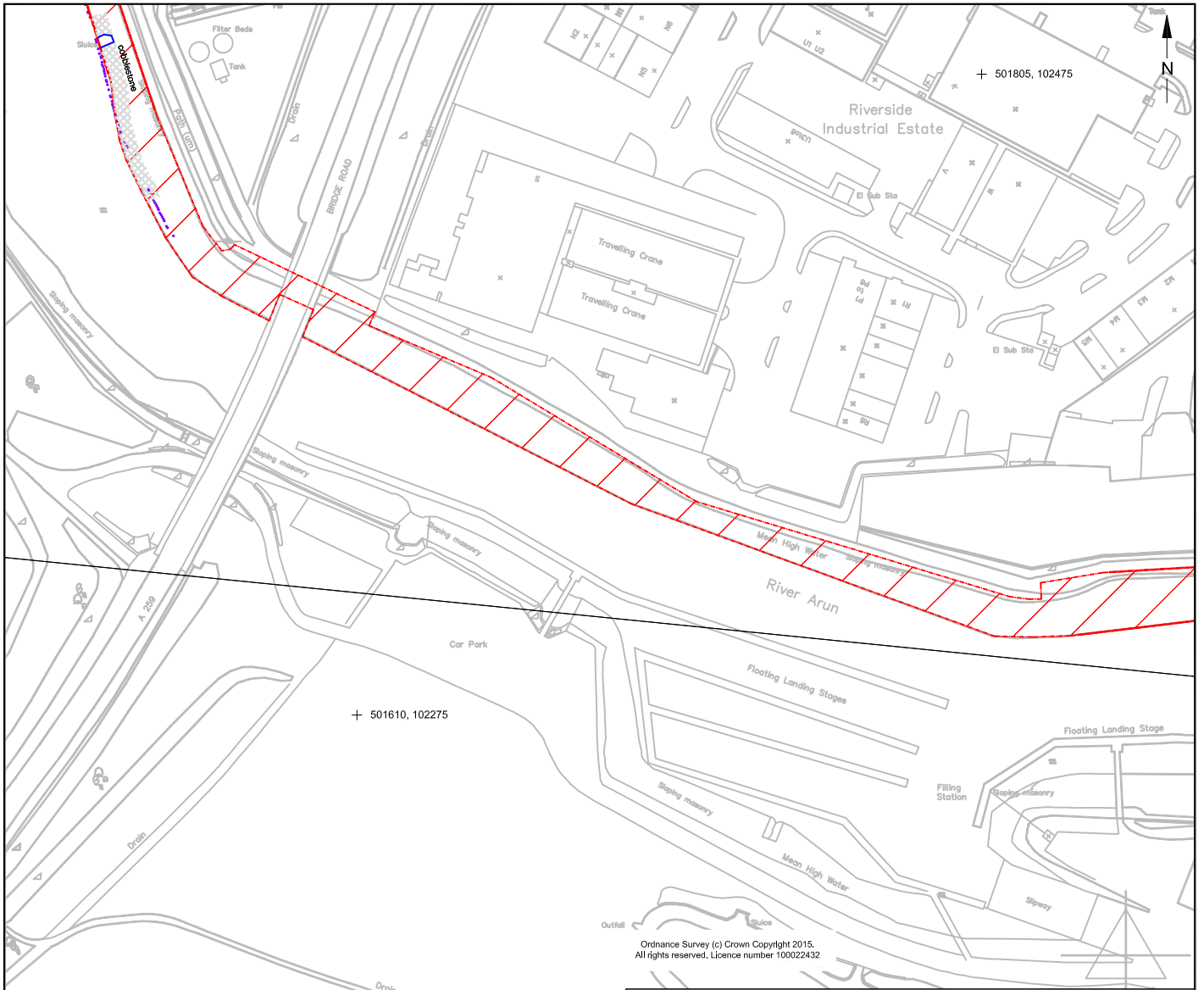


Section 1, looking south east

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Project Ref: 6403	04 - 2015	Reach 5		
Report Ref: 2015104	Drawn by: NG			



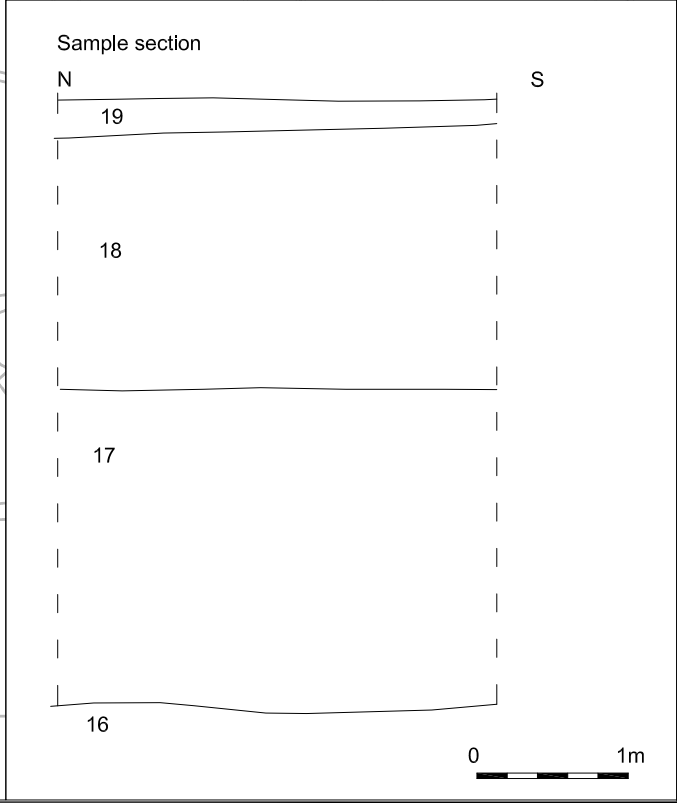
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Project Ref: 6403	04 - 2015	Reach 6		
Report Ref: 2015104	Drawn by: NG			



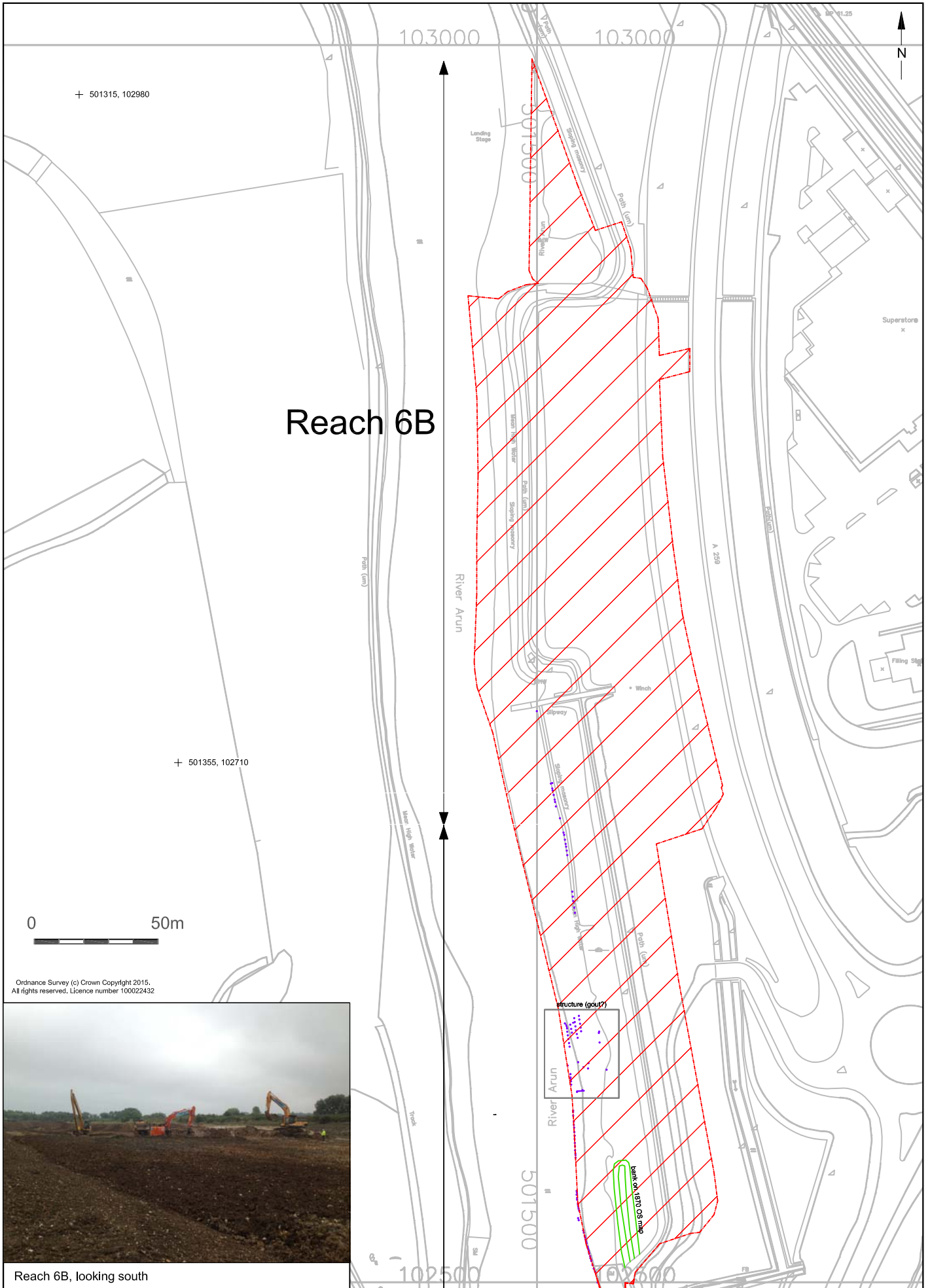
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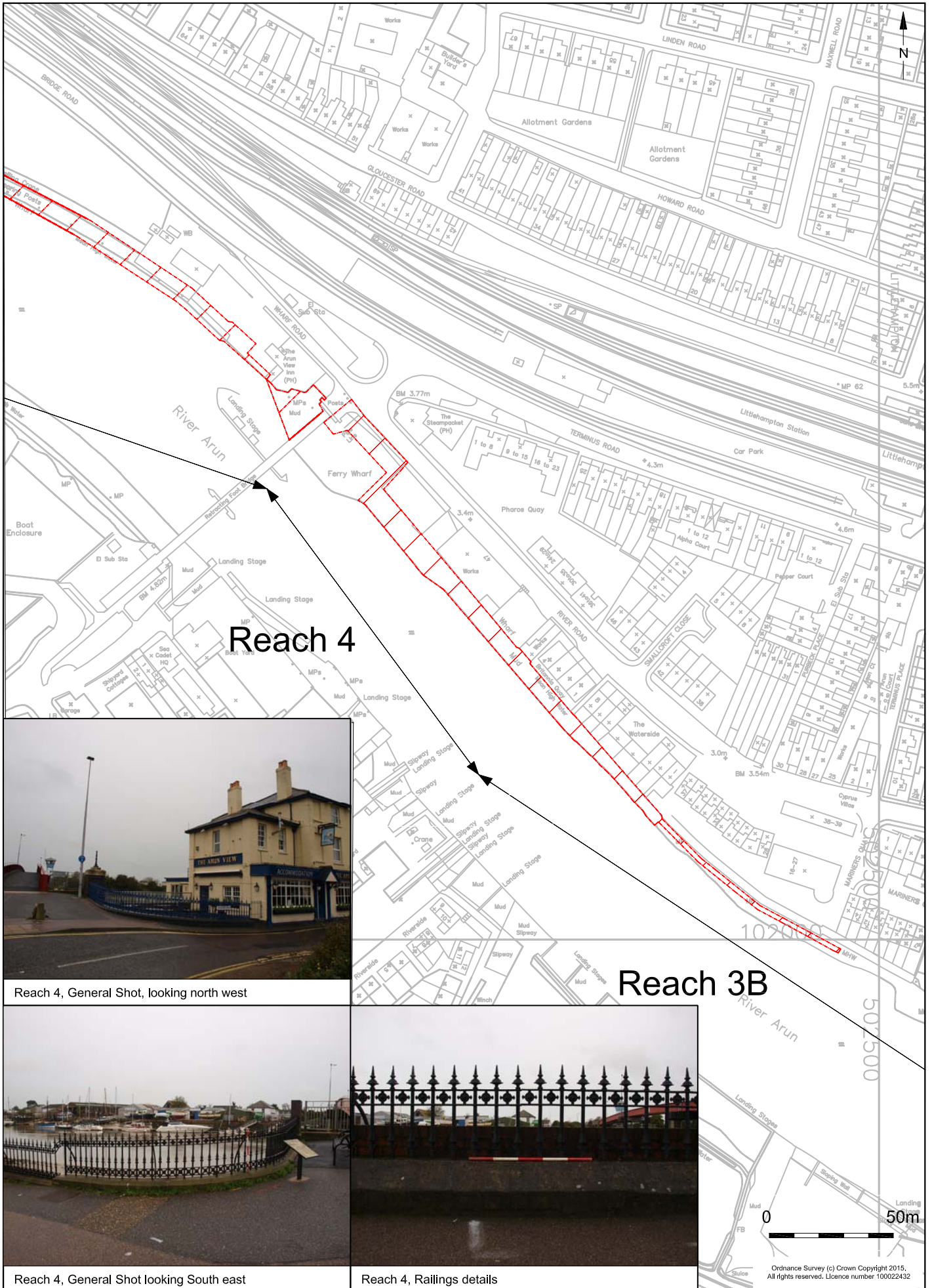
Sample section, looking east



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Report Ref: 2015104	Drawn by: NG			



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Project Ref: 6403	04 - 2015	Reach 6B		
Report Ref: 2015104	Drawn by: NG			



Reach 4

Reach 3B



Reach 4, General Shot, looking north west



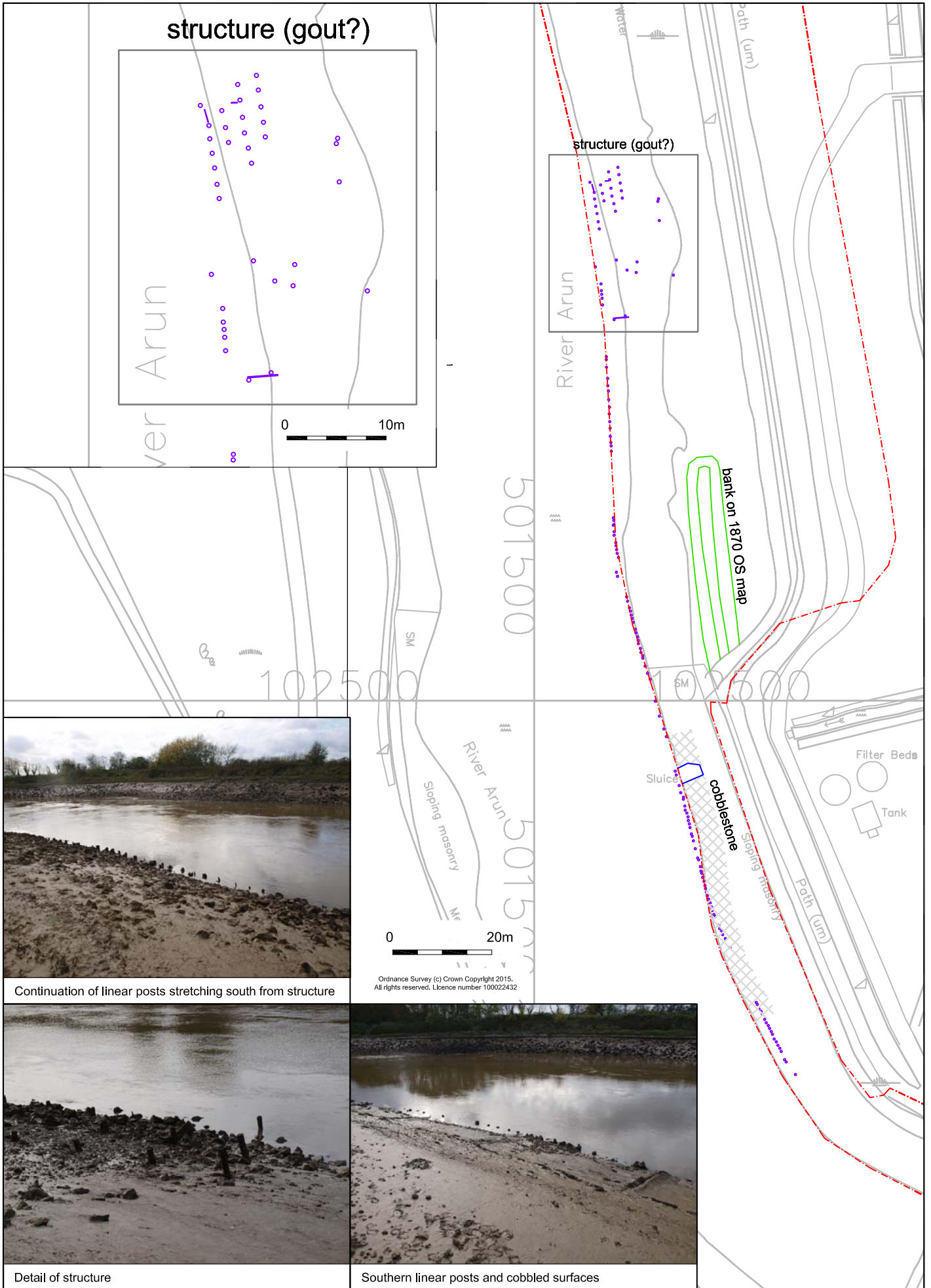
Reach 4, General Shot looking South east



Reach 4, Railings details

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Project Ref: 6403	04 - 2015	Reach 6, Foreshore		
Report Ref: 2015104	Drawn by: NG			

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