

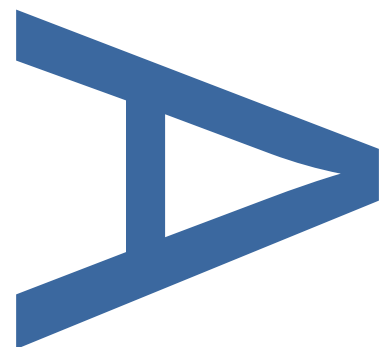
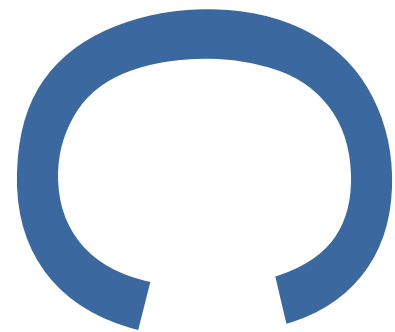
**LONDON BRIDGE ISLAND,  
BOROUGH HIGH STREET /  
STATION APPROACH / GUILDABLE  
MANOR STREET, SOUTHWARK,  
LONDON SE1 2SX**

**AN ARCHAEOLOGICAL IMPACT  
ASSESSMENT AND  
GEOTECHNICAL WATCHING BRIEF**

**SITE CODE: OUY19**

**LOCAL PLANNING AUTHORITY:  
LONDON BOROUGH OF SOUTHWARK**

**NOVEMBER 2019**



**London Bridge Island, Borough High Street / Station Approach / Guildable  
Manor Street, Southwark, London SE1 2SX: An Archaeological Impact  
Assessment and Geotechnical Watching Brief**

**Local Planning Authority: Southwark**

**Planning Ref:**

**Central National Grid Reference: TQ 32772 80278**

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**Commissioning Client: Frankham Consultancy Group Ltd.**

**PCA Report Number: R13926**

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**DOCUMENT VERIFICATION**

**London Bridge Island, Borough High Street / Station Approach /  
Guildable Manor Street, Southwark, London SE1 2SX**

**An Archaeological Impact Assessment and Geotechnical Watching Brief  
Quality Control**

<b>Pre-Construct Archaeology Limited</b>	
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## 1 NON TECHNICAL SUMMARY

- 1.1 Pre-Construct Archaeology Limited was commissioned by Frankham Consultancy Group Ltd. to undertake an archaeological impact assessment of the London Bridge Island Site, Southwark, London. The site is currently occupied by five vacant retail premises (henceforth termed 1047 to 1051 from east to west, see Figure 2) that are housed within a building that incorporates within its fabric railway viaduct arches that carry an active railway line. The viaduct arches form the internal north–south walls of the retail units.
- 1.2 The proposal for the site is to modify the basements of the retail units, the detail of which has not yet been defined.
- 1.3 Previous work in the immediate vicinity of the site has demonstrated that it lies within Roman and later Southwark. Whilst the current buildings have extensive basements throughout, several sites nearby, which are also basemented, have encountered archaeological remains pertaining to the Roman period or later below the basement slabs.
- 1.4 This impact assessment was therefore carried out to assess the depths of the current basements, incorporate the results of geotechnical investigations and cross refer these results with the known archaeological levels of nearby sites. A new reinforced ground slab of c.250mm thickness is proposed throughout the current buildings, but no deeper horizontal excavation or new basements are planned. Piled foundations are proposed, with a slab above for reinforcement, but no pile caps.
- 1.5 The impact assessment has concluded that archaeological remains are likely to survive beneath the majority of the basements on the site. Potentially a stratified multi-period archaeological sequence could be intact between 2m and 3m deep below current basement floor level. This activity could date from the Roman period onwards with medieval and post-medieval activity potentially extant.
- 1.6 This report is designed to fulfil the requirement for an archaeological Desk Based Assessment and archaeological evaluation report to accompany the planning application as the site is located in an Archaeological Priority Area as defined in the London Borough of Southwark's Local Plan. The site is located in an area of known archaeological interest and several previous excavations have taken place on and around the site. It was therefore agreed, in discussion with the Senior Archaeology Officer to the London Borough of Southwark, that an archaeological impact assessment and the results of the archaeological monitoring of the geotechnical works would be a suitable approach to the report requirement of this site at the planning application stage.

## 2 INTRODUCTION

### 2.1 Origin and Scope of the Project

- 2.1.1 A large amount of archaeological work has taken place in the immediate vicinity of the site, which has demonstrated that it lies in the heart of Roman, Late Saxon, medieval and post-medieval Southwark. Although the current buildings are basemented, several nearby archaeological investigations have demonstrated that archaeological material survives elsewhere in the immediate vicinity beneath basements of similar depth. This was confirmed through the implementation of an archaeological monitoring exercise (a watching brief) within the site itself, which monitored the excavation of geotechnical test pits and window samples that were dug to determine the nature and depth of the existing foundations. The results of the watching brief are integrated herein.
- 2.1.2 Gillian King, Senior Archaeology Officer at the London Borough of Southwark, requested that the geotechnical works be subject to archaeological monitoring and that an archaeological impact assessment be carried out in order to inform the archaeological requirement for the site prior to commencement of the works proper.
- 2.1.3 This report has been commissioned by Frankham Consultancy Group Ltd. and will accompany the planning application for the site.
- 2.1.4 Rather than provide a more general overview of archaeological activity in Southwark, which has been undertaken by other researchers on many separate occasions, this assessment instead makes focused predictions relating to the probable nature of the underlying archaeological resource within the confines of the site. To do this, it makes use of the aforementioned geotechnical information obtained from the watching brief that was recently undertaken on the site itself as well as using similar information gleaned from archaeological interventions in the immediate vicinity. This data is used in combination with cross sections and plans of the current basements with OD heights to assess the levels of survival of the archaeological resource and in turn the severity or otherwise of future impacts arising from the proposed scheme.
- 2.1.5 This report has been prepared in accordance with the standards specified by the Chartered Institute for Archaeologists (CIFA 2008).
- 2.1.6 This impact assessment was written and researched by Rebecca Haslam and Neil Hawkins of Pre-Construct Archaeology Ltd. using plans and sections provided by the client. Geotechnical investigation information was also collated by Pre-Construct Archaeology.
- 2.1.7 A visit to the proposed development site was undertaken on 16th October by the author, and the basements examined in order to inform the findings of this assessment. The geotechnical investigations were archaeologically monitored between 28<sup>th</sup> and 31<sup>st</sup> October 2019.

### **3 THE SITE AND PROPOSED SCHEME**

#### **3.1 The Site**

3.1.1 The site is currently occupied by a building with one above-ground storey and a basement level that is roughly triangular in plan. It incorporates within its fabric seven footings that carry railway viaduct arches that in turn support an active railway line that connects London Bridge Station with stations to the north and west. The site is situated in the south-eastern part of London, approximately 130m to the south of the River Thames. It is bound by Borough High Street to the north-west, Station Approach to the north-east and Guildable Manor Street to the south. It lies to the immediate north of London Bridge Station and is approximately 130m to the south of London Bridge, which connects this part of Southwark with the City of London (Figures 1 & 2).

3.1.2 At present, the building is unevenly divided between six retail units of variable sizes that variously open onto Borough High Street, Station Approach and Guildable Manor Street as shown in Figure 2. The building faces onto all three streets and is structurally integral to the continuation of the railway viaduct to the east and west, which crosses Station Approach to the east and Borough High Street to the west before branching north across the Thames to Cannon Street and west to Waterloo. The site sits to the immediate south of a second railway viaduct, which carries the recently constructed Thameslink line between London Bridge Station and Blackfriars. Southwark Cathedral is situated opposite the site to the north, while London Bridge Station proper is situated beyond the Thameslink Viaduct to the south (Figure 2).

#### **3.2 The Proposed Scheme**

3.2.1 The proposed development of the site will involve modifications at ground floor and basement level. The detail of this is yet to be set out and will in part be informed by the results of this and other studies. Any modifications will also be subject to approval by Network Rail as well as the local planning authority. Information that is contained in the following paragraphs may therefore be subject to change.

3.2.2 The results of a programme of geotechnical trial pitting and window sampling will play an important role in determining the nature of the proposed scheme (Figure 5). This trial pitting exercise consisted of the excavation of nine pits distributed across the entire site at basement level that were approximately c. 0.6m<sup>2</sup> square and c. 1.2m deep. Six window samples were also distributed across the entire area at basement level. The trial pits were dug against the existing basement walls in order to determine the depth and nature of the existing foundations while the window samples were located away from the foundations in order to investigate the underlying deposits. The geotechnical trial pitting and window sample exercise provided an opportunity to evaluate the underlying geological and archaeological conditions within the site itself through the implementation of an archaeological watching brief (the results of which are integrated herein).

3.2.3 At ground level, the existing proposal is to replace the floor and the core arch roof, which is to be supported by mezzanine columns. No further details are known at present. At basement level, the existing floors are to be replaced with a reinforced concrete slab, the thickness of which is yet to be determined. New basement floors are to have soft joints with the existing walls and will be underlain by a damp-proof membrane. The piling will be in the existing basements of 1050, 1049, 1048/47. The piling is to ensure that no pressure is applied to the railway viaducts and they will support a new ground floor. There are no new basements proposed.

3.2.4 Draft piling configurations for the slab are shown in Figure 7. The access to the buildings for machinery is constrained, which will affect the type and nature of the piles. It is currently proposed to have a 250mm thick slab with reinforcement, the slab may be thickened slightly or have additional reinforcement around the pile locations to prevent punching shear but the client would aim to limit the excavation to 500mm. There would be no need for pile caps.

3.2.5 The depth of the piles would be limited due to the underground structures below, as noted in the geotechnical investigations. The most efficient solution for this slab may

be to have a smaller diameter pile but more of them in order to keep the punching shear down, which would keep the slab thinner and avoid exceeding 500mm with the excavation.

- 3.2.6 Piles are likely to be small diameter piles (maybe 150-200mm dia). Due to access restrictions, augered or screw piles would need to be used to avoid vibrations and they are likely to be in the region of 12m deep. Final piling design and methodology will need to be agreed with the piling contractor. The contractor should be able to achieve 250kN per pile which puts the grids at 3m x 2m. This would therefore assume around 16No. piles for Arch 1050, 44No. for Arch 1049 and 43No. for Arches 1048 & 1047 together. This will change depending on the pile loads achievable and will hopefully be reduced where possible (pers comm Richard Sellwood, Structural Engineer, Frankhams).
- 3.2.7 The proposed development site covers a roughly triangular area that measures approximately 69m E–W by a maximum of 23m N–S, occupying a footprint of c.793.5m<sup>2</sup> (Figure 2).
- 3.2.8 Four of the five retail units within this building possess basements. They are described below from east to west and are illustrated in Figure 4:
- 1047 is partially basemented, the basement being situated in the eastern half of the unit;
  - 1048 is virtually fully basemented, except for the central part of the southern half of the unit;
  - 1049 is fully basemented, although some of the footings of the dividing walls thicken at basement level, thus decreasing the width of the basement room at the southern end relative to the width at first floor level;
  - only the northern half of 1050 is basemented;
  - 1051 does not possess a basement.



## 4 GEOLOGY AND TOPOGRAPHY

### 4.1 Geology

- 4.1.1 London is located within the Thames Basin, a broad syncline of chalk filled by Tertiary sands and clays, which is overlain by the Pleistocene (Quaternary) gravel terraces of the River Thames. The low-lying area to the south of the Thames was characterised as largely marshland, with ground level being c.14m lower than the north bank (MoLAS 2003a).
- 4.1.2 The original river was shallower, slower and wider than its modern manifestation and flowed through braided channels which surrounded the low-lying gravel eyots located beneath modern Southwark. Archaeological excavations and geotechnical work have established that there were two principal gravel eyots, covering an area of c.16 hectares (MoLAS 2003a).
- 4.1.3 The area of the site is located within the boundaries of the northern eyot, which is variably known as the 'Bridgehead Island' (MoLAS 2003a) or 'Northern Island'. The island extends between Joiner Street to the east and Southwark Bridge Road to the west, Union Street and Southwark Street to the south and the River Thames to the north.
- 4.1.4 The site is generally located within areas of high-ground, with the natural sands and gravels occurring between 1.00m-1.20m OD and the land set back from the tidal channels, at a distance removed from the surrounding foreshores. When untruncated natural deposits occur below these heights, it is generally an indication that the land surface is 'dropping' towards a channel edge and it can be assumed that the land would have been susceptible to flooding, especially during high-tides.
- 4.1.5 Previous archaeological excavations at the adjacent Railway Approach Site (BVL10) to the south recorded natural terrace gravel between 0.7m OD and 0.09m OD.
- 4.1.6 The geotechnical investigation undertaken on the site recorded natural terrace gravel within WS2, WS3 and WS5 at 1.01m OD, 0.52m OD and 0.38m OD respectively. WS2 was located in Building 1050, WS3 in Building 1049 and WS5 in Building 1048.

### 4.2 Topography

- 4.2.1 The site is situated within the vaults located beneath the London Bridge Island, modern and basement levels within the buildings are tabulated below;

Building	Ground floor (m OD)		Basement (m OD)	
	High	Low	High	Low
1047	9.15	N/A	5.45	N/A
1048	9.45	8.95	5.91	5.31
1049	9.15	8.2	5.27	4.75
1050	8.5	N/A	5.91	5.55
1051	8.05	N/A	N/A	N/A

- 4.2.2 Guildable Manor Street (formerly 'Railway Approach'), directly south of the site is located between 9.41m OD at its eastern end sloping down to 7.7m OD to the west.
- 4.2.3 The site is located on the eastern side of Borough High Street, approximately 135m to the south of the River Thames. The projected location of the now buried Guy's Channel is situated c. 100m to the east, whilst the projected location of the now buried Southwark Street Channel is located c. 170m to the south.

## 5 GEOTECHNICAL INVESTIGATION

5.1 A geotechnical investigation was undertaken on the site in October 2019, the original methodology for which comprised 15 trials and 9 window samples to be undertaken from either ground or basement level (Mayo 2019). Due to on site constraints and time pressure the geotechnical contractor only undertook nine test pits (TP) and six window samples (WS) (Figure 5).

### 5.2 Phase 1: Natural

5.2.1 Natural sandy gravel deposits were recorded within three of the interventions during the geotechnical watching brief, WS2, WS3 and WS5. This horizon was consistently a sandy gravel deposit through all window samples and was located at 1.01m OD in WS2 (context [34]), 0.52m OD in WS3 (context [11]) and at 0.38m OD in WS5 (context [19]). This horizon was consistent with the known underlying geology of the site as described by the British Geological Survey.

### 5.3 Phase 2: Undated deposits

#### WS2

5.3.1 Sealing the natural sandy gravel [34] in WS2 was a sequence of sterile and homogenous silt, gravel, clay and sand deposits, contexts [29], [30], [31], [32] and [33]. This depositional sequence was recorded at a highest level of 2.61m OD and had a combined thickness of 1.6m.

### 5.4 Phase 3: Post-Medieval

#### TP3

5.4.1 Recorded within TP3 was sequence of post-medieval made ground deposits. This sequence consisted of a dark grey clayey silt with frequent red brick inclusions, context [23], overlain by a light grey lime mortar demolition layer, context [22]. This sequence was recorded at a highest level of 4.75m OD and had a combined thickness of 0.6m.

#### WS2

5.4.2 Sealing Phase 2 deposit [29] in WS 2 was a sequence of post-medieval layers. This comprised a light grey lime mortar demolition deposit with red brick fragment inclusions, context [28], overlain by a dark grey silt deposit again with brick fragment inclusions, context [27]. This sequence of two layers was recorded at 4.81m OD and had a combined thickness of 2.2m.

#### WS3

5.4.3 Directly sealing the natural sandy-gravel horizon [11] in WS3 was a sequence of two demolition/made ground deposits upon which was a possible brick wall. Context [10], which sealed natural gravel [11], was a mixed light grey lime mortar layer with red brick fragment inclusions which was sealed by context [9], a dark grey silt deposit again with inclusions of red brick fragments. These deposits were recorded at a highest level of 2.3m OD and had a combined thickness of 1.78m.

5.4.4 Sealing these deposits within the window sample was a probable brick wall, [8], which was composed of handmade red bricks bonded with orange sandy-lime mortar. This probable wall was recorded at 2.9m OD and was 0.6m thick. Sealing red brick wall [8] was another made ground deposit, [7], which consisted of a greyish brown silt with inclusions of brick fragments and oyster shell. This layer was recorded at 3.97m OD and 1.07m thick.

#### WS4

5.4.5 The earliest archaeological horizon recorded within WS4 was a probable brick wall, context [5]. This wall was composed of handmade red bricks bonded by a brown sandy-lime mortar. Recorded at 3.27m OD this wall was at least 0.2m thick but the window sample could not penetrate deeper.

5.4.6 Overlying red brick wall [5] was a layer of made ground, context [4], which consisted of a dark brown silt deposit with frequent brick fragment inclusions. This deposit was recorded at 4.07m OD and was 0.8m thick.

TP9

5.4.7 Recorded within TP9 was a sequence of two made ground deposits, contexts [12] and [13]. Layer [12] was a dark brown silt with red brick fragment inclusions overlying layer [13], a grey sand deposit again with inclusions of red brick fragments. These deposits were recorded at a highest level of 4.01m OD and had a combined thickness of 0.4m.

TP11

5.4.8 TP11 recorded a layer of made ground, context [15], which consisted of a dark grey silt with inclusions of red brick fragments. This layer was recorded at 4.28m OD and was at least 0.3m thick but continued deeper beyond the trench limit.

WS5

5.4.9 Sealing natural sandy gravel layer [19] within WS5 was a sequence of made ground deposits, contexts [17] and [18]. Context [18] comprised a substantial thick layer of dark grey clay which contained red brick fragment inclusions overlain by deposit [17], a mortar demolition layer with brick and peg tile fragment inclusions. These deposits were recorded at a highest level of 3.48m OD and had a combined thickness of 3.1m.

5.5 Phase 4: Mid-19<sup>th</sup> -20<sup>th</sup> century

5.5.1 Made ground of probable 19<sup>th</sup> century date was recorded within the greater majority of TPs and WSs. This was predominantly represented by a dark brown silt deposit which contained frequent yellow stock and red brick fragment inclusions, the heights and thickness of which are tabulated below.

	Context No	Max Height (m OD)	Max Thickness (m)
TP3	[20], [21]	5.25	0.5
TP4	[24], [25]	5.56	0.85
WS2	[26]	5.71	0.9
TP5	[1]	4.67	0.6
TP6	[2]	4.47	0.5
WS3	[6]	4.47	0.5
WS4	[3]	4.67	0.6
TP11	[14]	4.88	0.6
WS5	[16]	4.88	1.4

5.6 Phase 5: Modern

5.6.1 Modern made ground and concrete completed the depositional sequence within all geotechnical interventions. This concrete represented the current basement floor level. The basement floor was recorded at 5.91m OD and 5.55m OD in Building 1050, at 5.27m OD in Building 1049 and 5.31m, 5.38m and 5.45m OD in Building 1048.

5.6.2 The geotechnical interventions within Building 1051 (TP1, TP2 and WS1) were undertaken at modern ground level as it had no basement. All three of these interventions exclusively recorded modern deposits; TP1 recorded modern deposits to 0.42m below ground level, 7.63m OD, where a concrete surface was encountered and not penetrated beyond. TP2 and WS1 recorded modern deposits to 0.85m below ground level, 7.2m OD, where a concrete obstruction was encountered and not penetrated beyond. Modern ground level was located at 8.05m OD throughout Building 1051.

5.6.3 TP15 and WS9 in Building 1048 recorded exclusively modern deposits. TP15 recorded modern deposits to 1.25m below ground level, 4.2m OD, where excavation was ceased and WS9 recorded modern deposits to 0.8m below ground level, 4.65m OD, where a concrete obstruction could not be penetrated beyond.

## 6 PREVIOUS INVESTIGATIONS

- 6.1 This part of Southwark has a rich and deep history and as such a plethora of archaeological excavations have taken place in the near vicinity of the site.
- 6.2 A detailed landuse diagram has been produced (Appendix 4) for twelve archaeological sites in the vicinity of the study site. This diagram illustrates by phase and period, and with associated Ordnance Datum heights, the archaeological remains present across those sites. A brief summary of these sites is presented below.
- 6.3 Site 1: Thameslink Green Dragon Court Excavation (BVX09, BVW10 & BVJ10)
- 6.3.1 Site 1 recorded natural gravel sealed by alluvial deposits. Roman activity consisted of a road (Road 1), constructed in the mid 1<sup>st</sup> century and in use throughout the Roman period, with associated clay and timber buildings fronting onto the road. A Boudiccan fire horizon sealed these buildings upon which was constructed a phase of late 1<sup>st</sup> – early 2<sup>nd</sup> century clay and timber buildings again fronting the road. Mid to late Roman activity comprised dumping and pitting.
- 6.3.2 Site 1 remained open ground with pitting and dumping throughout the medieval period. Later post-medieval masonry structures were then extant on the site during the 18<sup>th</sup> and 19<sup>th</sup> century.
- 6.3.3 Site 2: Thameslink Borough High Street Excavation (BVK11)
- 6.3.4 Site 2 recorded natural gravel sealed by alluvial deposits. Early Roman activity was represented by ground raising and limited industrial activity which was overlain by a Boudiccan fire horizon. Later 1<sup>st</sup> century activity comprised clay and timber buildings and subsequent construction of a masonry bathhouse structure, in use until the late Roman period.
- 6.3.5 Post-Roman activity at Site 2 comprised medieval pitting and substantial chalk foundations associated with St Thomas's. Post-medieval features included the yards/gardens to the rear of 16<sup>th</sup>/17<sup>th</sup> century burgage plots upon which were constructed 18<sup>th</sup> and 19<sup>th</sup> century masonry buildings.
- 6.4 Site 3: Thameslink Railway Approach Excavation (BVL10)
- 6.4.1 Site 3 recorded natural gravel between 0.09m OD and 0.7m OD. Roman activity comprised pitting interspersed with a series of organic peaty layers indicative of a waterlogged environment dating from the mid 1<sup>st</sup> to early 2<sup>nd</sup> century. Roman activity in the 2<sup>nd</sup> century comprised pits, a ditch and a posthole from which was recovered a large assemblage of building material suggestive of a masonry building in the vicinity which had been demolished. Late Roman activity consisted of dump layers illustrating this area to be undeveloped at the time.
- 6.4.2 Post-Roman activity at Railway Approach comprised pitting and rubbish disposal during the medieval period, pitting dated to the 16<sup>th</sup>/17<sup>th</sup> century, and 18<sup>th</sup>/early 19<sup>th</sup> century masonry buildings and associated structures.
- 6.5 Site 4: London Bridge Excavation Area 8 (LBB95)
- 6.5.1 Site 4 recorded natural gravel overlain by alluvial deposits. Early Roman activity comprised ground reclamation, quarrying and a clay and timber outbuilding. Further clay and timber buildings and a masonry building were present during the late 1<sup>st</sup>/early 2<sup>nd</sup> century which were replaced by an entirely new phase of clay and timber buildings and successive rebuilds, during the mid to late Roman period.
- 6.5.2 The first phase of post-Roman activity recorded on Site 4 comprised 16<sup>th</sup> – 17<sup>th</sup> century pitting which was replaced by an 18<sup>th</sup> – early 19<sup>th</sup> cemetery.
- 6.6 Site 5: Mayor Sworder's Arches Evaluation Areas 8 and 9 (MSA92)
- 6.6.1 Site 5 recorded natural gravel overlain by alluvium and may represent the north edge of the North Island. Roman activity comprised dumping and a drainage ditch in the early Roman period upon which was constructed a clay and timber building in the late 1<sup>st</sup> century.

- 6.6.2 Post-Roman activity consisted of chalk foundations for a substantial building dated from the mid to late medieval period and subsequently a series of masonry buildings and associated structures from the 16<sup>th</sup> to 19<sup>th</sup> centuries.
- 6.7 Site 6: Mayor Sworder's Arches, Joiner Street Evaluation and Watching Brief (MSA92)
- 6.7.1 The earliest archaeological phase recorded at Site 6 consisted of a horizon of dark earth which began accumulating in the late Roman period. Subsequent activity comprised pitting dated from the Saxo-Norman to medieval period followed by late medieval chalk foundations representing the Priory of St. Pancras. Post-medieval activity included pitting dated to the 16<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> century.
- 6.8 Site 7: Mayor Sworder's Arches Evaluation Phase 2, Test Pits 1, 2, 5 and 6 (MSA92)
- 6.8.1 Site 7 recorded natural gravel overlain by brickearth. Multi-phase Roman activity included early Roman make up layers and dumping upon which was constructed clay and timber buildings. A masonry building dated to the late 1<sup>st</sup>-early 2<sup>nd</sup> century was also recorded which was subsequently robbed in the later Roman period and an associated demolition deposit lain down. Post-Roman activity on Site 7 comprised dumping dated to the Saxo-Norman to medieval period and a later 19<sup>th</sup> century sewer.
- 6.9 Site 8: London Bridge Station Excavation Area 2 (LBB95)
- 6.9.1 Site 8 encountered natural gravel cut by a Bronze Age pit which was overlain by foreshore deposits. Early Roman activity comprised make-up and dump layers interspersed by episode of flooding and a well. Due to horizontal truncation the next phase of activity consisted of masonry buildings, associated structures and pitting dated to throughout the post-medieval period.
- 6.10 Site 9: Mayor Sworder's Arches Evaluation Phase 2 Telephone House Trenches (MSA92)
- 6.10.1 The earliest phase of activity recorded on Site 9 comprised dumped deposits from the Saxo-Norman to medieval period. Subsequent to this was a considerable dump deposit which contained an artefactual assemblage dated to the 13<sup>th</sup>/14<sup>th</sup> century which has been interpreted as probably relating to St. Thomas's Hospital.
- 6.11 Site 10: New London Bridge House Evaluation Test Pits 1 and 2 (LBN08)
- 6.11.1 Site 10 recorded natural gravel with the earliest activity comprising Roman masonry buildings dated to the late 1<sup>st</sup>-early 2<sup>nd</sup> century. Post-Roman activity comprised a dark earth horizon followed by dumping and pitting during the Saxo-Norman to medieval period and during the 16<sup>th</sup>-17<sup>th</sup> century.
- 6.12 Site 11: Mayor Sworder's Arches Excavation Trenches 1A, 2A and 3A (MSA92)
- 6.12.1 The excavation at Site 11 recorded natural gravel sealed by alluvial deposits. Early Roman activity comprised an infilled channel, quarrying, dumping and a clay and timber building. Roman activity continued into the late 1<sup>st</sup> – early 2<sup>nd</sup> century with the construction of building with mosaic floor. External Roman activity continued into the later Roman period with a ditch or gully.
- 6.12.2 Post-Roman activity consisted of dumping dated to the Saxo-Norman to medieval period and late medieval chalk foundations for a substantial building. A horizon of dumping was then recorded dating to the 16<sup>th</sup>/17<sup>th</sup> century upon which was constructed a series of 18<sup>th</sup>/19<sup>th</sup> century masonry building and associated structures.
- 6.13 Site 12: New London Bridge House Evaluation Test Pits 3 and 4 (LBN08)
- 6.13.1 The earliest deposit recorded on Site 12 comprised an alluvial sequence within a channel. The only other archaeological activity recorded on this site consisted of dumping and pitting dated to the 16<sup>th</sup>/17<sup>th</sup> century.

## 7 HISTORIC MAPS

7.1 The historic maps illustrated below show the development of the site from the medieval period onwards. The site was located in the garden of the Prior Lewes's Inn (Plate 1) and also contained buildings fronting onto the High Street during this period. The High Street ran through the site at this point to the original location of London Bridge, rather than on its current alignment further west.



Plate 1: Medieval London 1270-1300 copyright [www.layersoflondon.org](http://www.layersoflondon.org)



Plate 2: Tudor Map 1520 copyright [www.layersoflondon.org](http://www.layersoflondon.org)

- 7.2 During the Tudor period (Plate 2), the Boar's Head pub was present in the west of the site with a churchyard in the east. Long Southwark, the main street, was present in the west of the site.



Plate 3: Faithorne and Newcourt 1658 copyright [www.layersoflondon.org](http://www.layersoflondon.org)

- 7.3 During the 17<sup>th</sup> century (Plates 3 and 4) a series of densely packed buildings fronting onto Borough High Street are shown and a similar layout is also present on the site in the 18<sup>th</sup> century (Plate 5). Borough High Street is shown as being much closer to its current alignment.



Plate 4: Morgan's Map 1682 copyright [www.layersoflondon.org](http://www.layersoflondon.org)



Plate 5: Rocque map 1746 copyright [www.layersoflondon.org](http://www.layersoflondon.org)





Plate 6: Greenwood 1828 copyright [www.layersoflondon.org](http://www.layersoflondon.org)

- 7.4 By the early 19<sup>th</sup> century, a burial ground is shown in the east of the site, with buildings in the west (Plate 6). The railway arches were constructed in the later 19<sup>th</sup> century creating the layout of the site as seen today (Plate 7).



Plate 7: Ordnance Survey 1897 copyright [www.layersoflondon.org](http://www.layersoflondon.org)

## 8 IMPACT OF PREVIOUS AND CURRENT DEVELOPMENT

- 8.1 Four of the five buildings extant on the site have basements. The varying Ordnance Datum heights throughout the basement are highlighted on Figure 4 and range broadly between 5.91m OD and 5.27m OD. Impacts of these basements are discussed within individual buildings below.
- 8.2 The basement of Building 1048, located between 5.45m OD and 5.31m OD, had three geotechnical interventions located only within the southern half of the basement, TP9, TP11 and WS9. These interventions suggested that modern and 19<sup>th</sup> century deposits were present to between approximately between 1m and 2m below ground level with possible post-medieval horizontal stratigraphy located between 4.28m OD and 3.48m OD. This illustrates little impact into the underlying potential archaeological sequence although only apparently post-medieval deposits were recorded within WS5. This is too small a sample size to evaluate definitively. On the adjacent Railway Approach site (Figure 3, Site 3) post-medieval archaeological remains were recorded from 3.78m OD, a post-medieval brick floor at 2.36m OD and Roman remains from c. 1.5m OD. As the natural terrace gravel was located at 0.38m OD in this building a considerable thickness of archaeological deposits are likely to be extant above the natural ground.
- 8.3 Building 1047, within the southeastern corner of Building 1048 only encountered modern deposits within the two geotechnical interventions, TP15 and WS9, to 1.25m and 0.8m below ground level. As this modern activity was only recorded to a maximum depth of 1.25m below ground level complete truncation cannot be assumed due to the depths at which archaeology could be present and therefore may still survive below.
- 8.4 The basement of Building 1049 was located at 5.27m OD and four geotechnical interventions were located within the northern two thirds of the area, TP5, TP6, WS3 and WS4. These interventions suggest modern and 19<sup>th</sup> century impact to c. 1.3m and 1.2m below ground level, c. 4.07m OD, where post-medieval horizontal deposits were extant. This again suggests a considerable depth of survival of potential underlying archaeological deposits which is attested to by the presence of post-medieval brick wall foundations at 3.27m OD and 2.9m OD. The presence of natural terrace gravel within this building at 0.52m OD further suggests considerable archaeological survival in this area.
- 8.5 The basement of Building 1050 was located between 5.55m OD and 5.91m OD and had three geotechnical interventions undertaken within it, TP3, TP4 and WS2. These interventions recorded modern and 19<sup>th</sup> century impacts to c. 0.8m and 1.1m below ground level, c. 4.8m OD, where post-medieval horizontal archaeological deposits were recorded. Again this suggests a considerable depth of archaeological survival, including the undated deposits recorded in WS2. Natural terrace gravel was recorded at 1.01m OD and therefore approximately 2m of archaeological deposits may be extant.
- 8.6 Building 1051, the only building without a basement, was located at 8.05m OD. Three geotechnical interventions were undertaken within the building (TP1, TP2 and WS1) all of which exclusively recorded modern deposits to 0.42m and 0.85m below ground level. Below ground truncation levels therefore cannot be determined precisely however as no basement exists it is assumed minimal below ground disturbance is present and therefore archaeological survival could be high.

## 9 IMPACT OF PROPOSED DEVELOPMENT

- 9.1 The proposed development of the site will involve modifications at ground floor and basement level. The detail of this is yet to be set out and will in part be informed by the results this and other studies. Any modifications will also be subject to approval by Network Rail as well as the local planning authority.
- 9.2 A proposed development which reduces the ground by 0.5m or less is unlikely to have an impact on archaeological remains of significance. A new slab is proposed which will be of c. 250mm thickness with no pile caps below, which would not impact upon archaeological levels on the site. No new basement excavations are proposed.
- 9.3 Piles are likely to be small diameter piles (maybe 150-200mm dia). Due to access restrictions, augered or screw piles would need to be used to avoid vibrations and they are likely to be in the region of 12m deep. Final piling design and methodology will need to be agreed with the piling contractor. The contractor should be able to achieve 250kN per pile which puts the grids at 3m x 2m. This would therefore assume around 16No. piles for Arch 1050, 44No. for Arch 1049 and 43No. for Arches 1048 & 1047 together. This will change depending on the pile loads achievable and will hopefully be reduced where possible (pers comm Richard Sellwood, Structural Engineer, Frankhams).
- 9.4 The impact of the proposed development on archaeological levels will therefore be solely from the piling. The piles themselves will be relatively thin and individually will have a low impact on the archaeological resource. A draft piling layout is shown in Figure 7.
- 9.5

## 10 CONCLUSIONS AND RECOMMENDATIONS

- 10.1 Geotechnical Watching Brief Conclusions
- 10.2 Phase 1: Natural
  - 10.2.1 The geotechnical watching brief encountered natural sandy gravel deposits within three of the geotechnical interventions, WS2, WS3 and WS5, located in Buildings 1050, 1049 and 1048 respectively. This sandy gravel horizon was consistent with the known underlying geology as encountered on previous archaeological investigations in close proximity and as described by the British Geological Survey, the Kempton Park Gravel Member. Running from west to east the natural gravel was recorded at 1.01m OD in WS2, 0.52m OD in WS3 and 0.38m OD in WS5.
  - 10.2.2 The Ordnance Datum height on this natural horizon suggests a general slope from west down to east but this may be misleading as the gravel surface recorded is probably a truncated surface due to the presence of post-medieval deposits directly sealing them and therefore does not represent the original topography. Only WS2 may represent an untruncated natural surface due to the depositional sequence which seals it (see below). The recorded height of the natural gravel is also consistent with the natural gravel recorded during the archaeological investigations at Railway Approach directly to the south, and indeed located within the same railway arches as the London Bridge Island site, where the gravel was located at a highest level of 0.7m OD.
- 10.3 Phase 2: Undated deposits
- 10.4 Sealing the natural gravel in WS2 was a stratified sequence of deposits which may represent activity pre-dating the post-medieval period. The sequence of deposits comprised sterile and homogenous clay, silts, and sands which contained virtually no visible inclusions. Across the rest of the watching brief all the recorded deposits contained inclusions of brick fragments suggesting a post-medieval date of activity. The depositional sequence in WS2 is therefore more akin to Roman or medieval flooding and dumping horizons as recorded at the Railway Approach site directly south of the site, however this is difficult to ascertain from a single WS. Recorded at a highest level of 2.61m OD this sequence had an overall thickness of 1.6m. It should be noted that a similar Ordnance Datum height on the adjacent Railway Approach site in the same basement area recorded features dating to the post-medieval period.
  - 10.4.1 Phase 3: Post-Medieval
  - 10.4.2 The watching brief recorded considerable activity dating to the post-medieval period within both the TPs and WSs. This activity predominantly consisted of dumped made ground and apparent demolition horizons and was identified by the presence of frequent red brick inclusions and less frequently peg tile fragments. No definitive dating for these deposits was recovered however and they are generally assigned to the broad post-medieval period. These post-medieval deposits were recorded between 4.81m OD and 3.48m OD and were between 2.2m and 3.1m thick.
  - 10.4.3 It should be noted however that some of the uppermost deposits assigned to this phase of activity could easily be of a 19<sup>th</sup> century date but without specific dating evidence this could not be determine precisely.
  - 10.4.4 Of some note within WS3 and WS4 in Building 1049 was the presence of a red brick wall foundation. These foundations were composed of handmade red bricks bonded by an orange sandy-lime mortar, however, as they were only recorded within a WS no full dimensions of the bricks could be noted. These brick walls were recorded at 2.9m OD and 3.27m OD. In WS3 where the wall was complete penetrated it had a height of 0.6m. These brick wall foundations, recorded in close proximity to one another, appear to represent the same structure, if not the same wall. A definitive date for these walls cannot be determined without dating evidence and they are therefore broadly assigned to the post-medieval period. However, the mortar type may suggest an earlier date range pre-dating the 18<sup>th</sup> century but it should not be discounted that they are of an early 19<sup>th</sup> century date. Documentary and cartographic evidence illustrates the area of the site was occupied by buildings fronting onto the predecessor of Borough High Street

- to the west from at least the 17<sup>th</sup> century onwards. Red brick walls [5] and [8] therefore relate to one of the many phases of buildings on the site during this period.
- 10.4.5 The presence of post-medieval deposits sealing and post dating the red brick wall illustrates that activity of this period was multi-phase. The nature and date of this multi-phase activity could not be determined from the findings of window samples alone.
- 10.5 Phase 4: mid-19<sup>th</sup> Century-20<sup>th</sup> Century
- 10.5.1 Activity dated to the 19<sup>th</sup> century was identified during the geotechnical watching brief within the majority of interventions. This 19<sup>th</sup> century activity was represented by made ground horizons which often were of a very similar nature to deposits which have been provisionally assigned to the post-medieval Phase 3 but in this instance the presence of yellow stock brick inclusions means they are assigned a later 19<sup>th</sup> century date. The 19<sup>th</sup> century made ground relates directly to the preparation and construction of the railway viaduct during the mid-19th century.
- 10.6 General Conclusions
- 10.6.1 In conclusion the geotechnical watching brief appeared to record natural terrace gravel sealed by undated deposits in WS2 and was elsewhere directly sealed by post-medieval horizons. This information is almost entirely derived from the window samples, the test pits did not go deep enough to penetrate into the earlier depositional sequence and were located against the basement walls and therefore may have been within backfill related to their construction. The presence of probable post-medieval deposits directly sealing natural strata may suggest the area of the site has been reworked during this period or may lie within the basement of a previously extant building which fronted onto the predecessor to Borough High Street to the west. Previous archaeological investigation in close proximity to the site, including the adjacent Railway Approach site which was undertaken within the same basement area, recorded natural gravel sealed by Roman, medieval and post-medieval deposits and features, a sequence you would expect to find in this location within Southwark.
- 10.7 The impact assessment has used information from geotechnical investigations, basement plans and sections and previous archaeological excavations to assess the archaeological survival on the London Bridge Island site.
- 10.8 It is clear that whilst parts of the site have been previously basemented, the exception being Building 1051, there is still a high potential for archaeological deposits of Roman, medieval and post-medieval periods to survive. Although the geotechnical watching brief appeared to predominantly find post-medieval remains, the stratigraphic sequence in WS2 being the exception to this, the nature and depth of the archaeological remains recorded elsewhere in the vicinity, notably on the adjacent Railway Approach (Figure 3, Site 3), illustrate that a considerable archaeological resource may be present.
- 10.9 The test pits and window samples monitored during the geotechnical watching brief were not of a large enough sample size to evaluate any potentially underlying archaeological deposits, features or structures fully. However, the watching brief has illustrated that, despite the presence of basements, minimal truncation exists below the basement level. The heights of the basements of London Bridge Island range from 5.91m OD to 5.27m OD. If a median of 0.5m thickness of modern truncation was deducted from this, representing the basement concrete slab and underlying levelling, then archaeological survival of significance could be potentially located between c. 5.4m OD and 4.80m OD. Indeed post-medieval deposits were recorded within the greater majority of the test pits and more pertinently in the window samples between 4.75m OD and 3.48m OD. The presence of horizontal post-medieval deposits suggests strongly that the underlying earlier archaeological sequence will be intact. This is illustrated by the presence of two recorded post-medieval red brick walls, located at 2.9m OD and 3.27m OD, which confirms the presence of intact archaeological remains. However, the possibility of a post-medieval basement as discussed above should not be discounted, which may have truncated any potential earlier deposits, features or structures.

- 10.10 The adjacent Railway Approach site (Figure 3, Site 3) is particularly relevant as it was located within the same basement arches and provides valuable information regarding the nature of the archaeology present and the height at which it would survive. This site recorded natural terrace gravel between 0.7m OD and 0.09m OD sealed by multi-phase Roman activity comprising marshy open areas with flooding, dumping, pitting and potential surfaces located generally between 1.42m OD and 0.82m OD. Post-Roman pitting was recorded at c. 2.25m OD and post-medieval (18<sup>th</sup> century) was recorded broadly at 3.78m OD along with a brick floor surface at 2.36m OD. The heights of these various phases lie considerably lower than the probable truncation levels identified at the London Bridge Island site and therefore add further weight to the survival of multi-phase archaeology on the site.
- 10.11 In summary, the impact from the proposed development on the potential archaeological resource is limited solely to the insertion of the new piles, which will be of 150mm to 200mm thickness. Horizontal truncation of the deposits will not take place to a depth where significant archaeology will be affected. Although the exact pile layout is yet to be confirmed, the number of piles and pile clusters proposed is relatively limited. If it is decided by the Senior Archaeology Officer for the London Borough of Southwark that this impact is significant, then further archaeological investigation may be required, secured by an archaeological planning condition. The nature and extent of this investigation work will be decided by the Senior Archaeology Officer.

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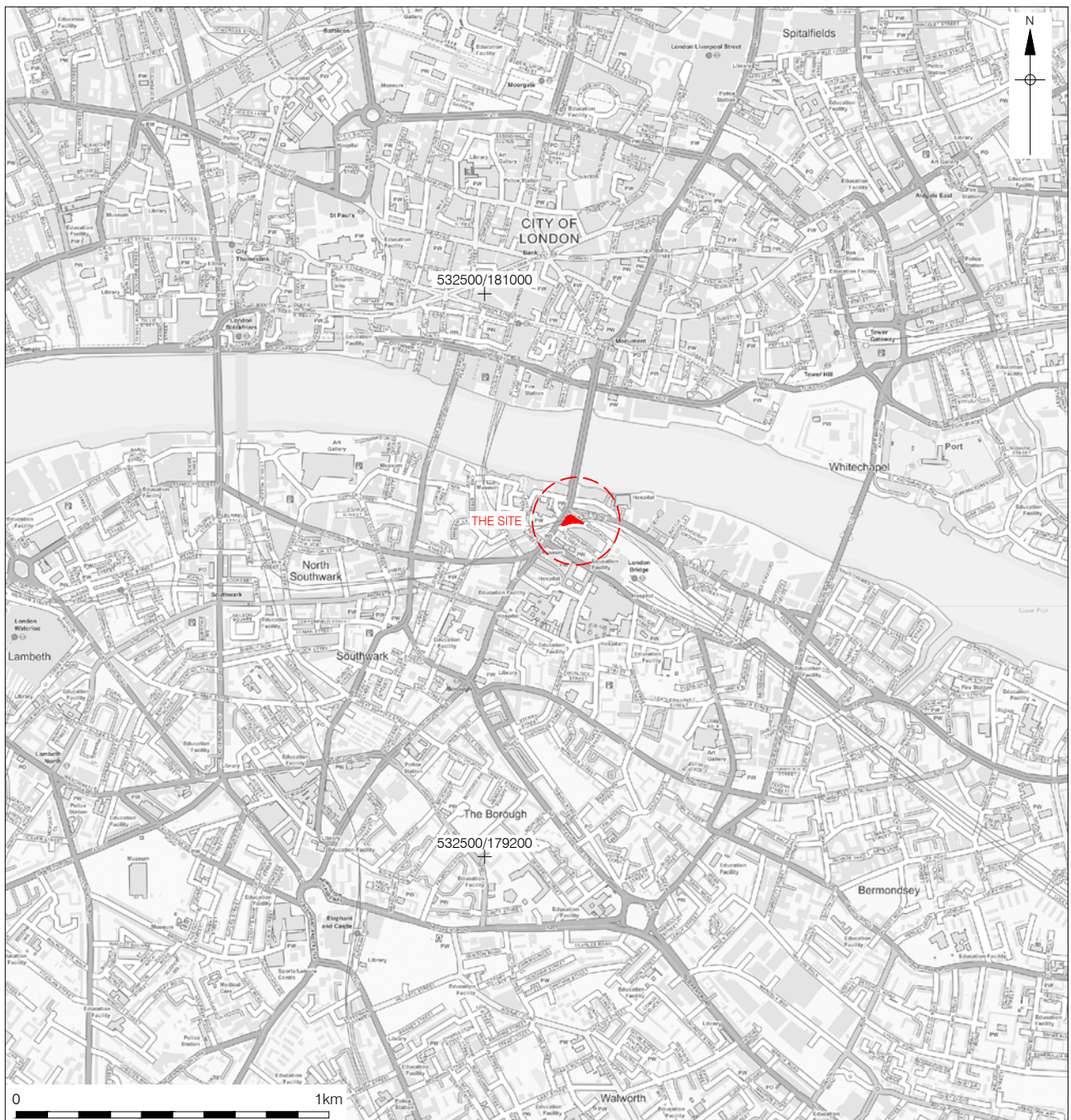
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## **12 ACKNOWLEDGEMENTS**

- 12.1 Pre-Construct Archaeology Ltd would like to thank Robert Battley at Frankham Consultancy Group Limited for commissioning this report and providing background material. Thanks also to the onsite geotechnical survey team and to Gill King, Senior Archaeology Officer at the London Borough of Southwark for her advice and information.
- 12.2 Additional thanks are extended to Mark Roughley for compiling the illustrations.



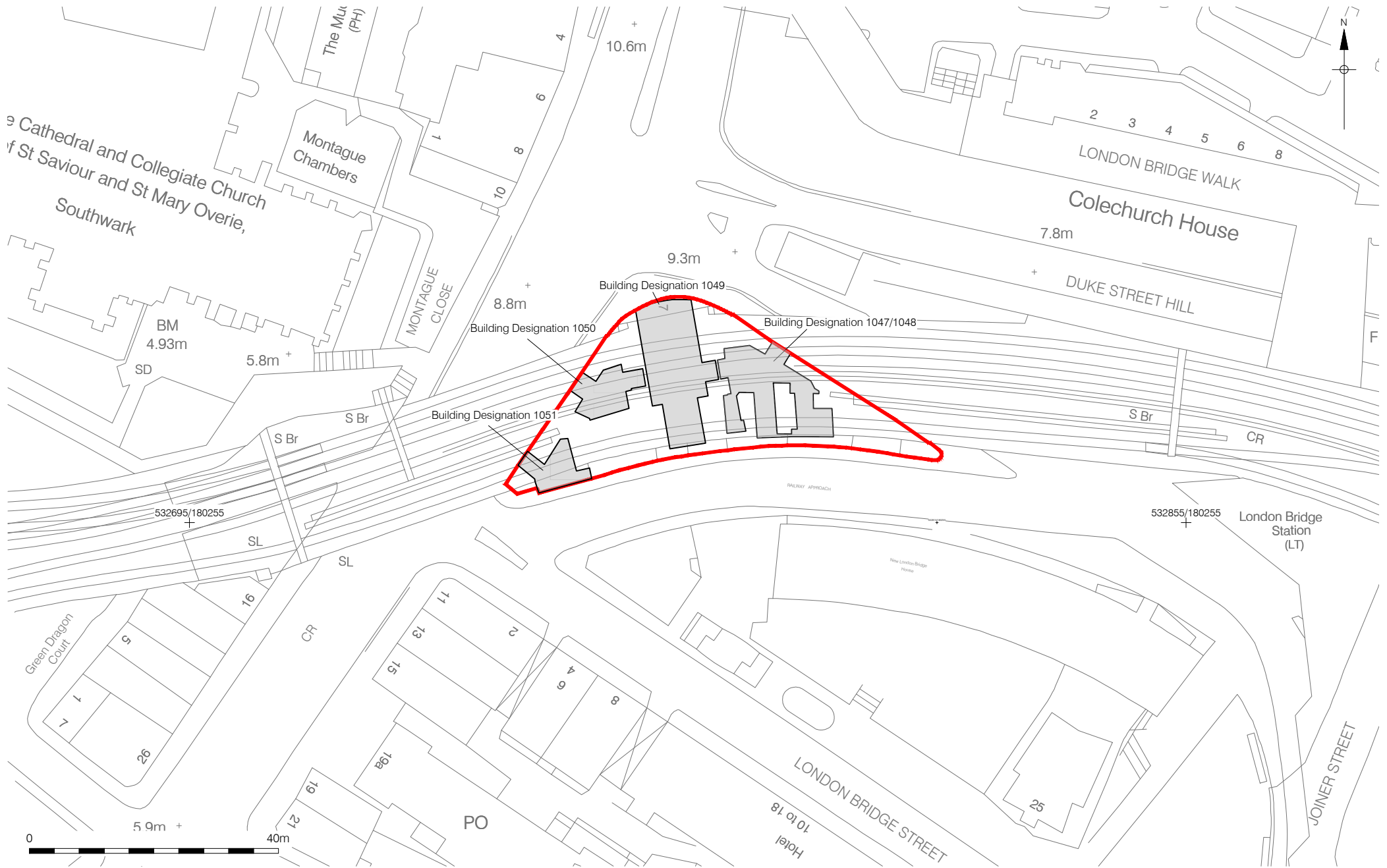


Figure 2  
 Trench Location Plan with Building Designations  
 1:800 at A4

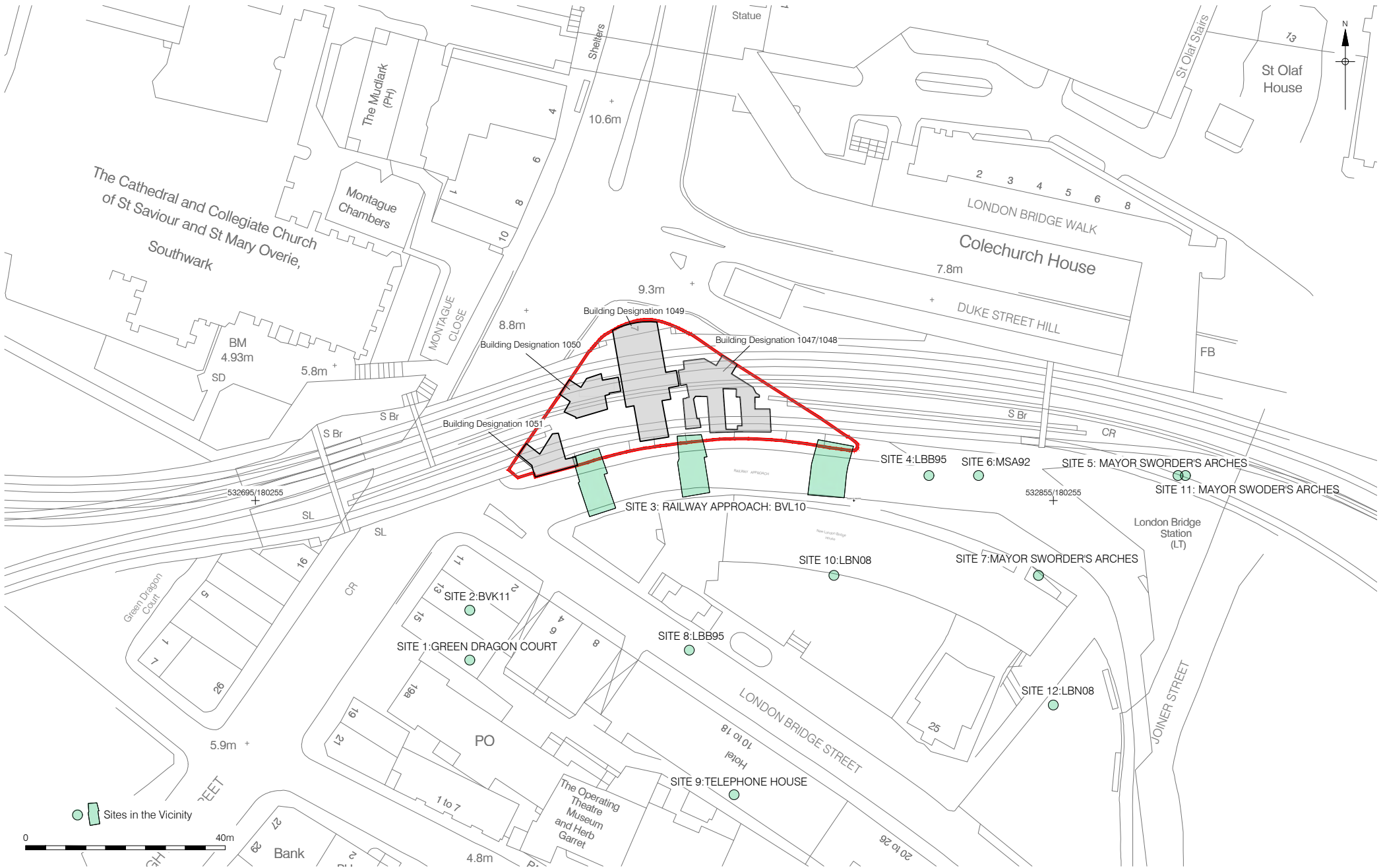


Figure 3  
 Sites in the Vicinity  
 1:1,000 at A4



Figure 4  
 Ordnance Datum Heights on Basement Level  
 1:400 at A4

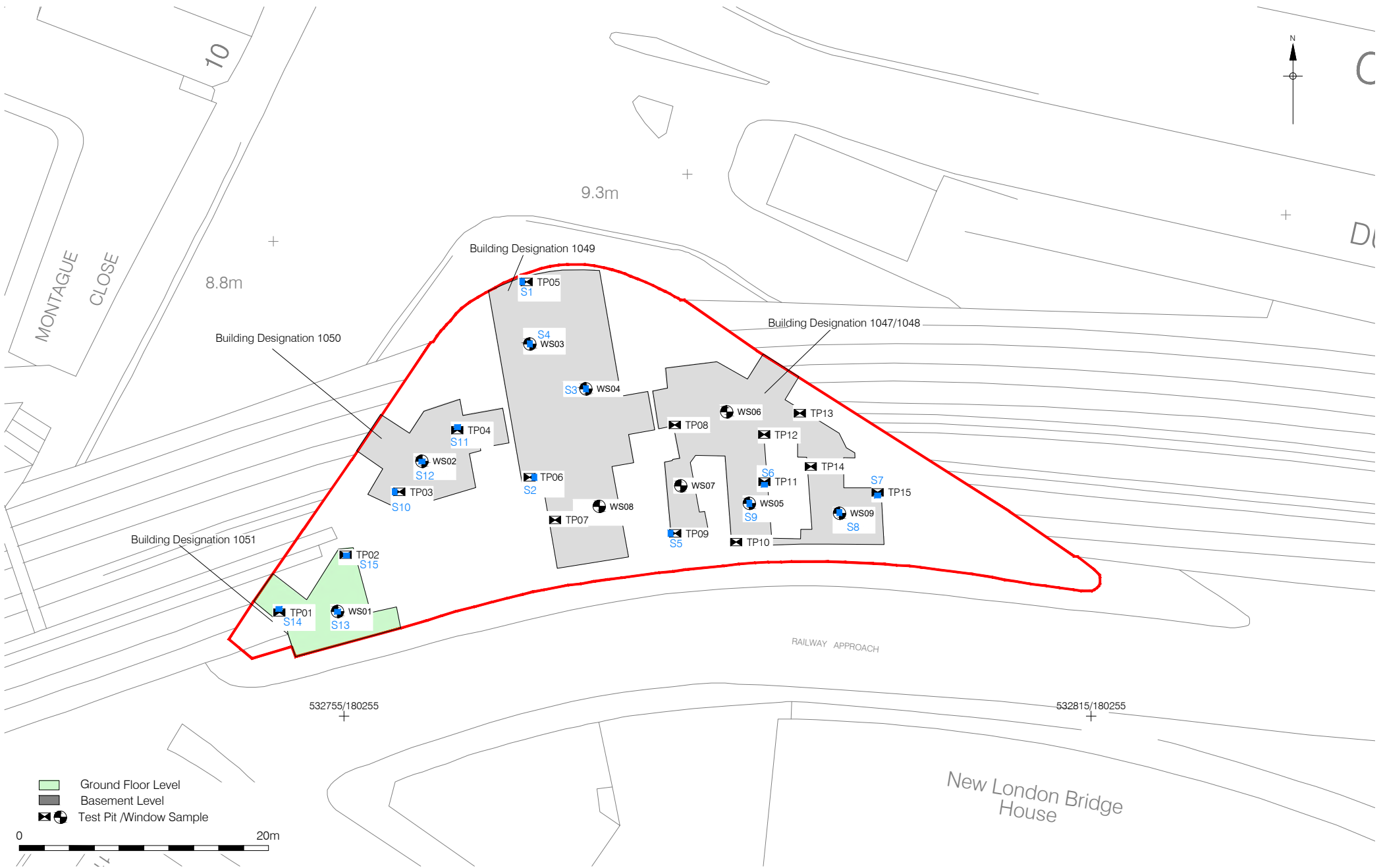


Figure 5  
 Plan of Window Sample , Test Pit and Section Locations  
 1:400 at A4



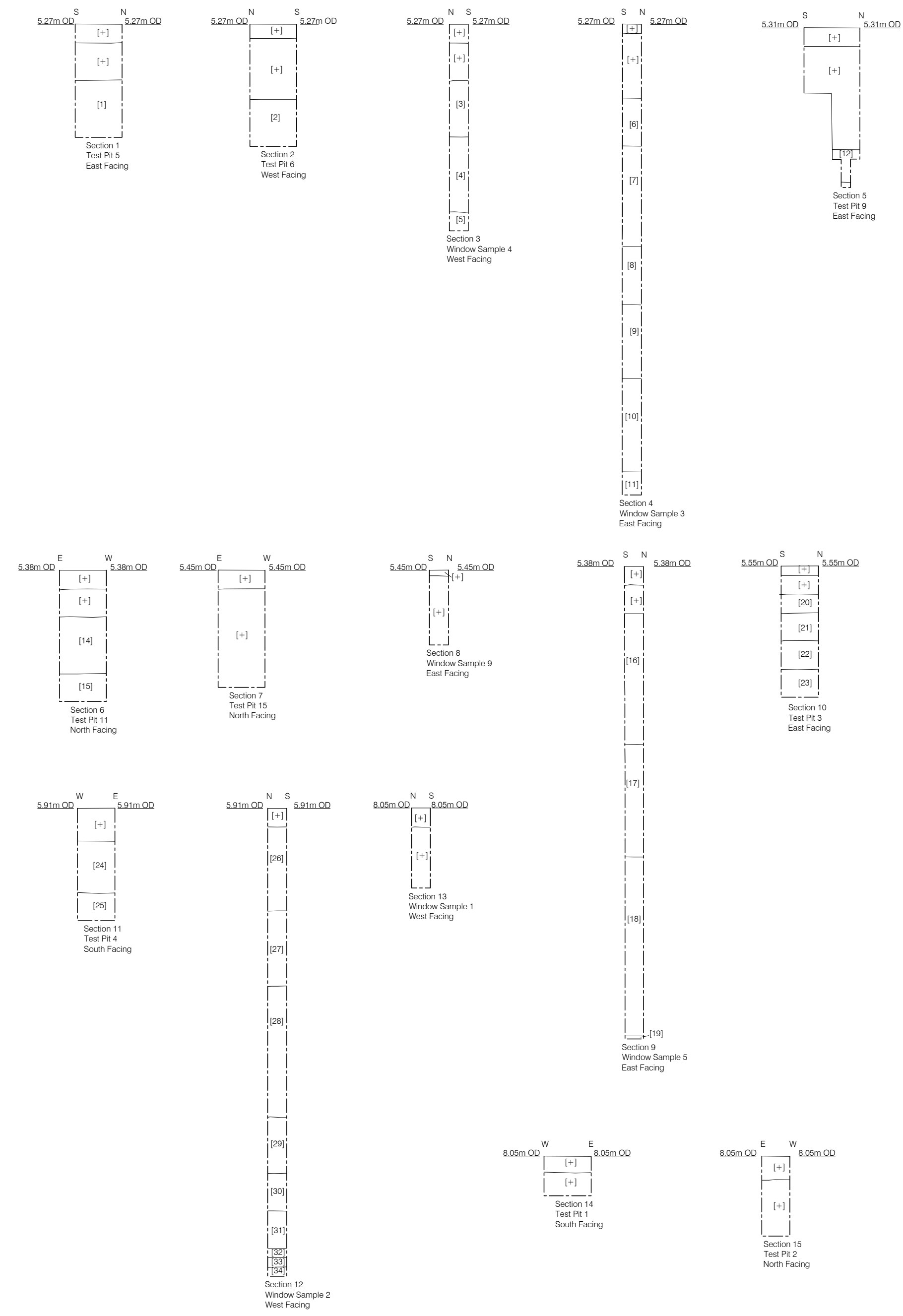
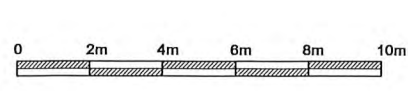
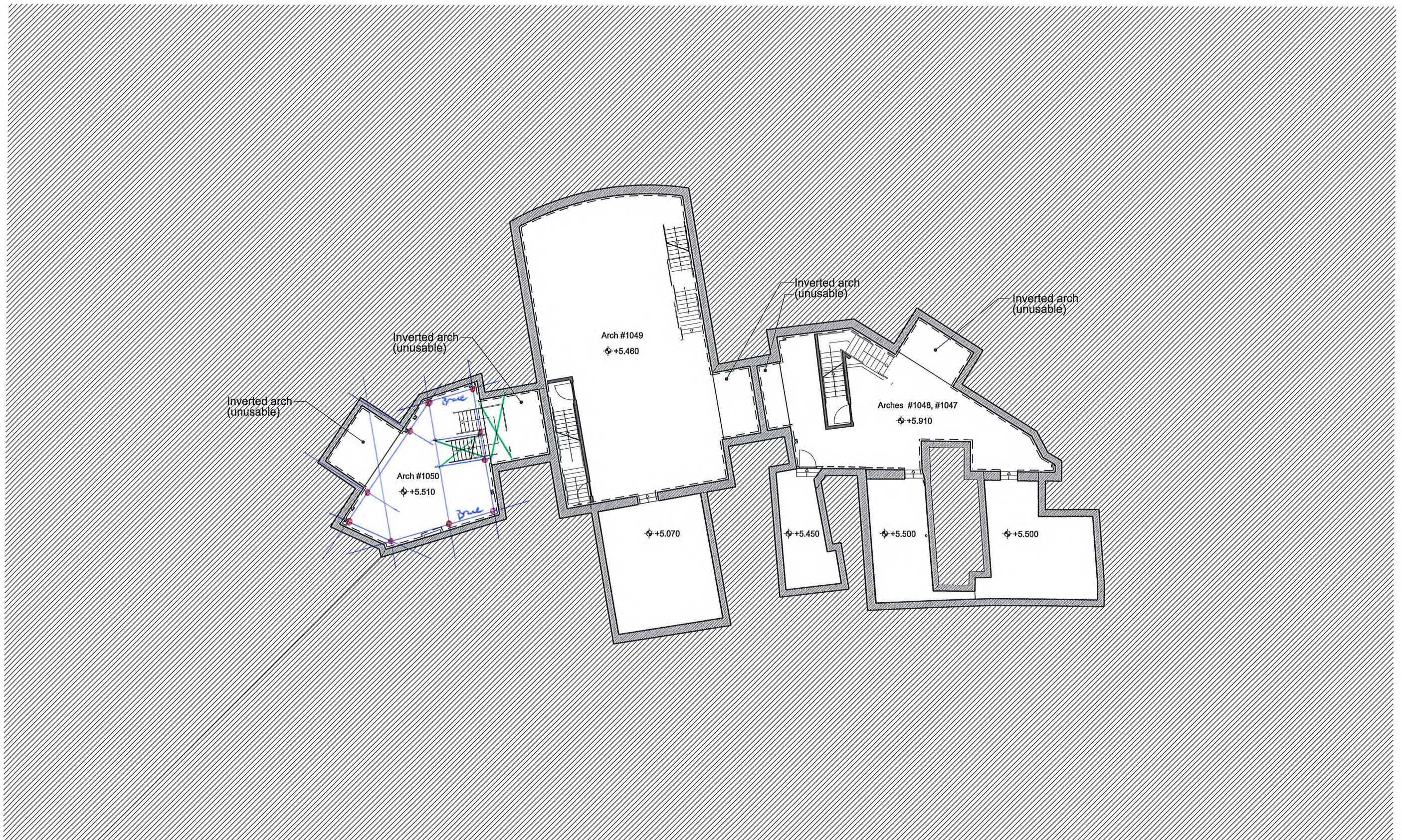


Figure 6  
Sections  
1:40 at A3

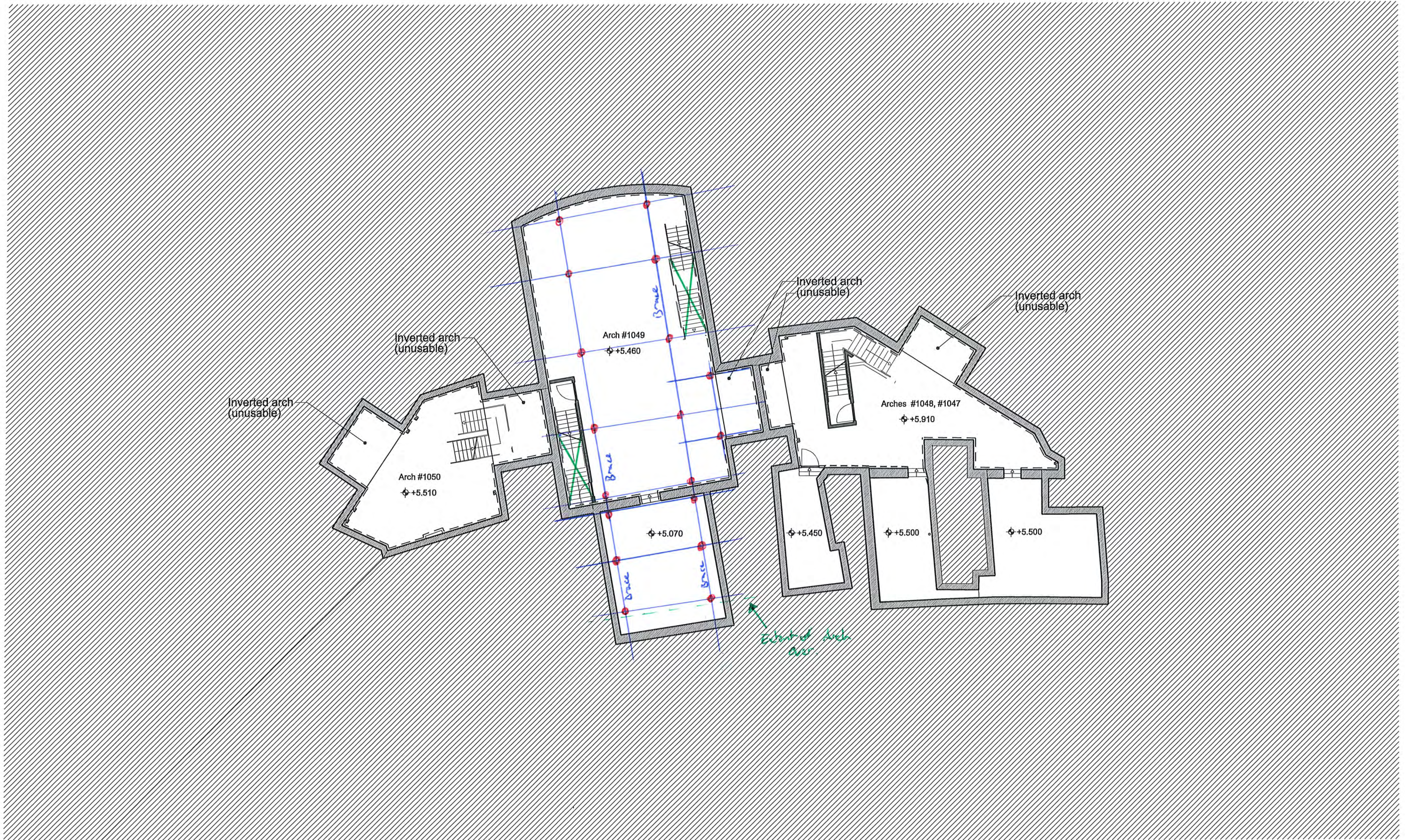
Figure 7: Draft Piling Layout

London Bridge Island  
Proposed Basement Level Block Plan



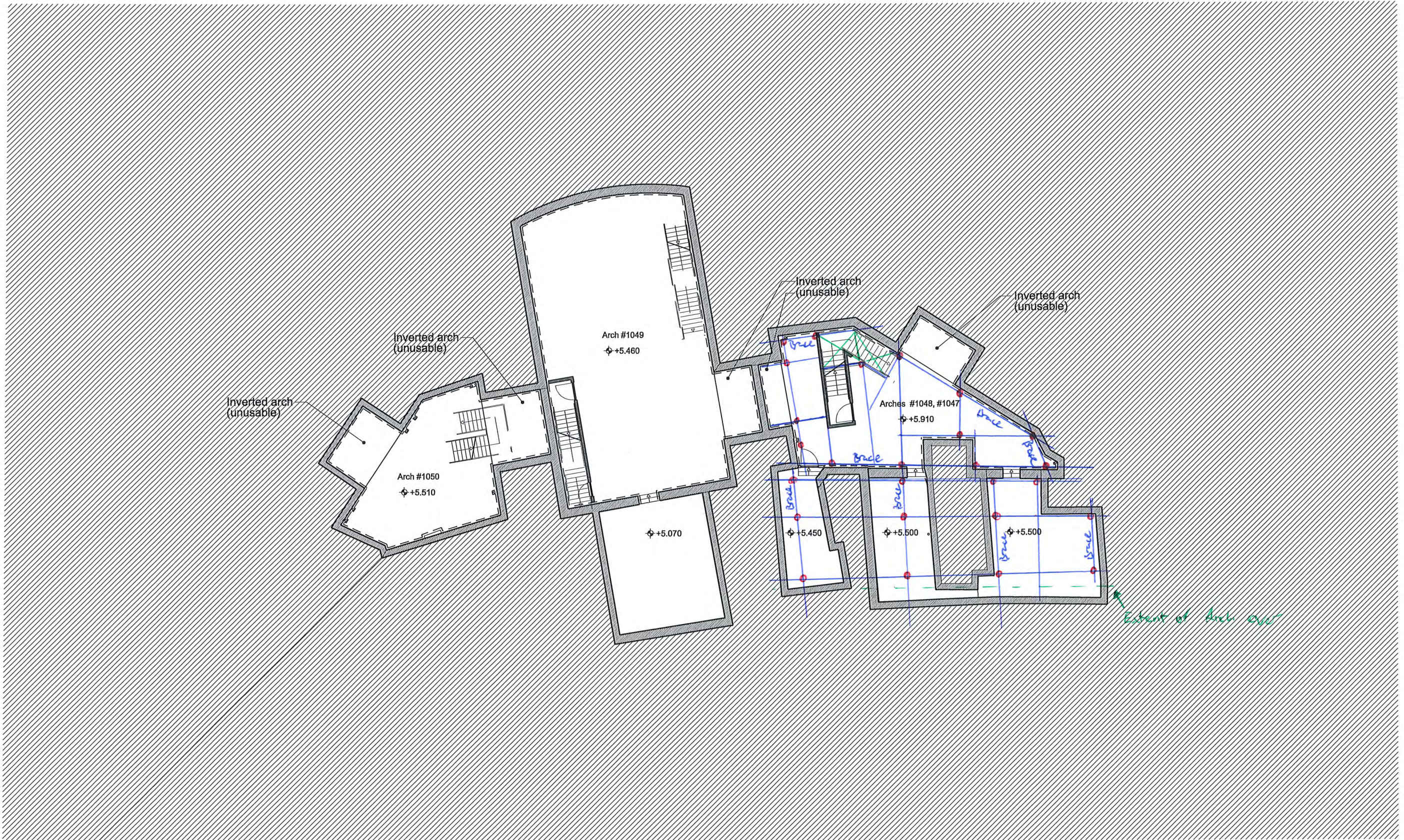
*Arch 1050 Proposed Column Locations.*  
*44-1359-FCG-XX-B2-SK-S-4906-SZ-POA*

London Bridge Island  
Proposed Basement Level Block Plan



*Arch 1049 Proposed Column Locations*  
44-1359-FCG-XX-132-SK-S-4907-SR-PC1

London Bridge Island  
Proposed Basement Level Block Plan



London Bridge Island

Planning Application

Do not scale from these drawings. Copyright Benedict O'Looney Architects 2019  
Verify all dimensions on site and report any discrepancies to the architect / contract administrator immediately. All structural elements to be designed by the structural engineer.

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DRAWING: LBG-p-200-pb  
DATE: 13/11/19

Arch 1043/1047 Proposed Column Locations  
441359-FCG-XK-RJ-SK-S-4903-SZ-PO1

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SE15 5TQ t: 0207 732 9713

## APPENDIX 1: CONTEXT INDEX

Context	CTX_Type	Trench	Section	CTX_ Interpretation	Depth	Levels_high	Phase
1	Layer	TP5	1	Made ground	0.6	4.67	4
2	Layer	TP6	2	Made ground	0.5	4.47	4
3	Layer	WS4	3	Made ground	0.6	4.67	4
4	Layer	WS4	3	Made ground	0.8	4.07	3
5	Masonry	WS4	3	Brick foundation	0.2	3.27	3
6	Layer	WS3	4	Made ground	0.5	4.47	4
7	Layer	WS3	4	Made ground	1.07	3.97	3
8	Masonry	WS3	4	Brick foundation	0.6	2.9	3
9	Layer	WS3	4	Made ground	0.78	2.3	3
10	Layer	WS3	4	Made ground	1	1.52	3
11	Layer	WS3	4	Natural sandy-gravel		0.52	1
12	Layer	TP9	5	Made ground	0.35	4.01	3
13	Layer	TP9	5	Made ground	0.05	3.66	3
14	Layer	TP11	6	Made ground	0.6	4.88	4
15	Layer	TP11	6	Made ground	0.3	4.28	3
16	Layer	WS5	9	Made ground	1.4	4.88	4
17	Layer	WS5	9	Made ground	1.2	3.48	3
18	Layer	WS5	9	Made ground	1.9	2.28	3
19	Layer	WS5	9	Natural sandy-gravel		0.38	1
20	Layer	TP3	10	Made ground	0.2	5.25	4
21	Layer	TP3	10	Made ground	0.3	5.05	4
22	Layer	TP3	10	Made ground	0.3	4.75	3
23	Layer	TP3	10	Made ground	0.3	4.45	3
24	Layer	TP4	11	Made ground	0.55	5.56	4
25	Layer	TP4	11	Made ground	0.3	5.01	4
26	Layer	WS2	12	Made ground	0.9	5.71	4
27	Layer	WS2	12	Made ground	0.8	4.81	3

Context	CTX_Type	Trench	Section	CTX_ Interpretation	Depth	Levels_high	Phase
28	Layer	WS2	12	Made ground	1.4	4.01	3
29	Layer	WS2	12	Sterile silty clay layer	0.6	2.61	2
30	Layer	WS2	12	Sterile sandy gravel layer	0.4	2.01	2
31	Layer	WS2	12	Sterile silty layer	0.4	1.61	2
32	Layer	WS2	12	Sterile sandy gravel layer	0.1	1.21	2
33	Layer	WS2	12	Sterile clay layer	0.1	1.11	2
34	Layer	WS2	12	Natural sandy-gravel		1.01	1







## APPENDIX 4: OASIS FORM

**OASIS ID: preconst1-373787**

### Project details

Project name	London Bridge Island Geotechnical WB
Short description of the project	A geotechnical watching brief on 9 test pits and 6 window samples. The window samples encountered natural gravel between 0.38m OD and 1.01m OD. Undated stratified deposits were recorded in one WS which may represent Roman or medieval horizons. Post-medieval brick walls were also recorded within the window samples at 3.27m OD and 2.9m OD. later 18th and 19th century made ground completely the stratigraphic sequence
Project dates	Start: 28-10-2019 End: 31-10-2019
Previous/future work	No / Yes
Any associated project reference codes	OOY19 - Sitecode
Type of project	Recording project
Site status	Local Authority Designated Archaeological Area
Current Land use	Industry and Commerce 3 - Retailing
Monument type	BRICK WALL Post Medieval
Investigation type	"Test-Pit Survey", "Watching Brief"
Prompt	National Planning Policy Framework - NPPF

### Project location

Country	England
Site location	GREATER LONDON SOUTHWARK SOUTHWARK London Bridge Island
Postcode	SE1 2SX
Study area	793 Square metres
Site coordinates	TQ 32772 80278 51.505318058029 -0.086722645047 51 30 19 N 000 05 12 W Point
Height OD / Depth	Min: 0.38m Max: 1.01m

### Project creators

Name of Organisation	Pre-Construct Archaeology Ltd
Project brief originator	Gillian King
Project design originator	Helen Hawkins
Project director/manager	Helen Hawkins
Project supervisor	Neil Hawkins

Type of sponsor/funding body	Developer
Name of sponsor/funding body	Frankham Consultancy Group Ltd

### Project archives

Physical Archive Exists?	No
Digital Archive recipient	MLAA
Digital Media available	"Database", "Text"
Paper Archive recipient	MLAA
Paper Media available	"Context sheet", "Plan", "Section"

### Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	London Birdge Island, Borough High Street/Station Approach/Guildable Manor Street, Southwark SE1 2SX. An Archaeological Impact Assessment and Geotechnical Watching Brief
Author(s)/Editor(s)	Haslam, R and Hawkins, N
Date	2019
Issuer or publisher	Pre-Construct Archaeology Ltd
Place of issue or publication	London
Entered by	Neil Hawkins (nhawkins@pre-construct.com)
Entered on	13 November 2019

## PLATES



Plate 1: WS2 All cores, Section 12



Plate 2: WS3, Cores 1-2m and 2-3m (Section 4: Contexts [6], [7] and [8])



Plate 3: WS3, Section 4: Contexts [10] and [11]



Plate 4: WS5, Section 9: Contexts [18] and [19]

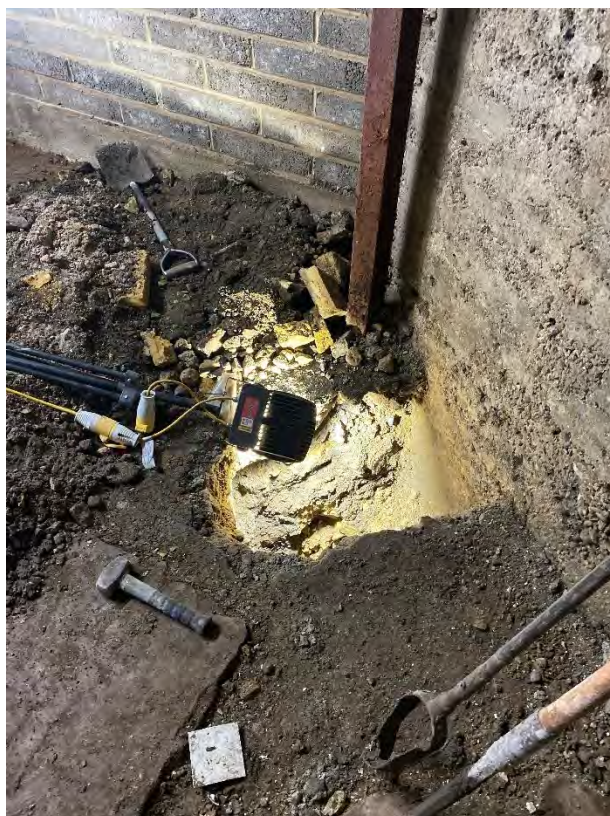


Plate 5: TP3, facing south



Plate 6: TP3, facing south



**Plate 7: TP9, facing southwest**



**Plate 8: TP9, facing west**

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