

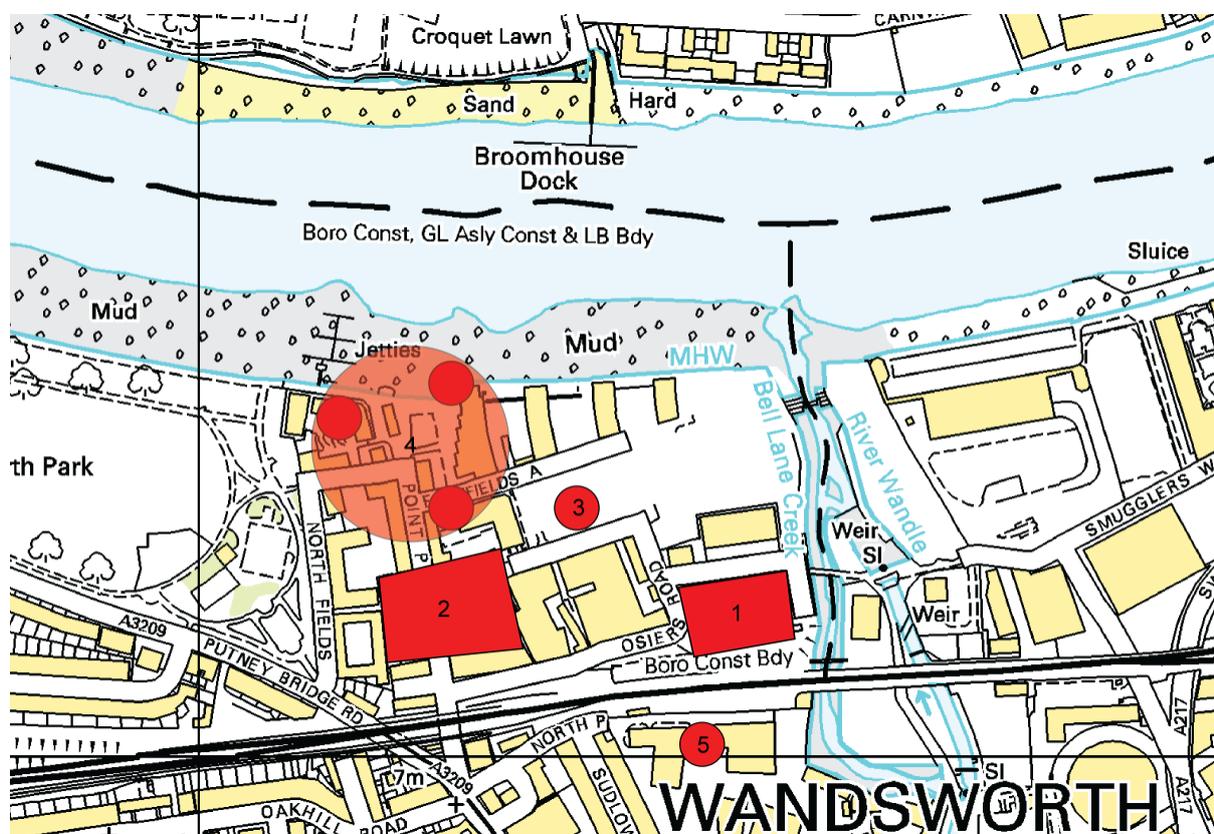
# OSIERS ESTATE, OSIERS ROAD, LONDON BOROUGH OF WANDSWORTH: DESK-BASED ASSESSMENT OF THE GEOTECHNICAL BOREHOLE RECORDS

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## INTRODUCTION

This report summarises the findings arising out of a desk-based investigation undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development at Osiers Estate, Osiers Road, London Borough of Wandsworth (National Grid Reference: centred on ca. TQ 254 751; Figure 1). Three geotechnical boreholes and nine window sample boreholes were recently put down at the site by CARD Geotechnics (2010; Figure 2); the aims of this desk-based investigation was to review these borehole records and (1) establish the sub-surface stratigraphy of the site, (2) compare it with that of nearby sites (including a 2-D deposit model), and (3) make recommendations for further investigations (if necessary).



**Figure 1: Location of Osiers Estate, Osiers Road, London Borough of Wandsworth (1) and selected other nearby sites: (2) Morganite Site; (3) Former Shell Oil Terminal; (4) Prospect Reach Foreshore and (5) Frogmore Depot.**

## GEOLOGICAL CONTEXT

The site is in the valley of the River Wandle, a right bank tributary of the tidal River Thames. It is about 200m upstream from the confluence with the Thames and immediately adjacent to the most westerly surviving distributary of the lower Wandle, sometimes called Bell Lane Creek. Historically the ground formed the south-east corner of Wandsworth Island and it appears to have remained in agricultural use until the end of the 19<sup>th</sup> century. Early maps (e.g. OS 1868) show tidal creeks extending westwards into the area from Bell Lane Creek. Throughout the 20<sup>th</sup> Century the site, and the whole of the former Wandsworth Island, was occupied by industrial premises. The British Geological Survey (BGS; 1:50,000 Sheet 270 South London 1998) shows the site as Made Ground over Alluvium resting on London Clay bedrock. Recent investigations on the Osiers Road site have recorded between 3.0m and 4.5m of Made Ground across most of the site. The present day surface of the site is uniform across the site, lying between 6.30m and 6.50m OD.

About 200m to the west of the Osiers Road site at the Morganite site on the east side of Point Pleasant (site code: POI05; Figure 1), at the western end of the former Wandsworth Island, an alluvial sequence has been recorded between 2.20m and -0.81m OD (Branch *et al* 2007; Jarrett *et al*, 2010). This sequence was thought to occupy a north-south channel cut down into the gravels of the Kempton Park Terrace which were seen to rise westward to levels between 3m and 5m OD. Early maps of the area (Rocque 1747) show a creek in approximately the position of this palaeochannel, but in the investigation of the Morganite site the eastern margin of the palaeochannel was not seen. It is possible therefore that the alluvial sediments lie at the edge of a more extensive spread of alluvium forming the floodplain at the mouth of the Wandle, in which case the top of this alluvial sequence is probably close to the level of the former natural ground surface of Wandsworth Island. The build-up of Made Ground above the palaeochannel sediments in the Morganite site can then be seen as bringing the ground surface up to the level of the Kempton Park Terrace, immediately to the west. At its base the alluvial sequence rested on gravel which should probably be regarded as part of the Wandle Gravel of Gibbard (1985), and equivalent to the Shepperton Gravel of the Thames valley and therefore of late last glacial (Devensian) age. This gravel was not bottomed at the Morganite site.

The alluvial sequence at the Morganite site consisted of silty sands with scattered clasts of flint (up to 25mm). These silty sands overlay peat and slightly gravelly organic silts which passed down into calcareous sands including remains of molluscs and ostracods, with a second peaty horizon at the base of the sequence resting directly on the underlying gravel. This sequence was dated from at least 4780-4420 to 1570-1410 cal BP (Branch *et al* 2007;

Jarrett et al, 2010). Other investigations nearby confirm the presence of organic sediments associated with the prehistoric River Wandle. At the Former Shell Oil Terminal, Point Pleasant (Figure 1; Perry and Skelton, 1995a), these have been radiocarbon dated to 3640-3380 cal yr BP and 2920-2500 cal yr BP (-1.2 to -0.7m OD). At the Prospect Reach Foreshore site, Point Pleasant (Figure 1; Perry and Skelton, 1995b), a radiocarbon-dated peat and alluvial sequence is of Roman and post-Roman age. To the south of the Morganite site at the Frogmore Depot, Dormay Street site, an alluvial sequence including organic-rich sediments and peat dated from at least 2460-2160 to 910-700 (site code: FDD04; Figure 1; MoLAS, 2004). Outside the immediate study area to the south, at Garratt Lane, the Museum of London Archaeology Service (site code: GLW01; Howe *et al.*, 2002) have recorded a sequence of basal sands and gravels from 2.0-3.5m OD overlain by prehistoric mineral-rich and organic sediments. These sediments were recorded as post-Bronze Age in date (2780-2370 cal yr BP).

In the Wandle valley, about 0.8km upstream from the Osier Road site, Gibbard (1985) illustrates a borehole transect across the valley showing *ca.*1.7m of gravel overlying London Clay at *ca.* 0.55m OD. The gravel is overlain by *ca.* 1.1m of alluvium with an upper surface at *ca.* 3.3m OD.



**Figure 2: Location of the geotechnical boreholes and window sample boreholes at Osiers Estate, Osiers Road, London Borough of Wandsworth**

## **INTERPRETATION AND DISCUSSION OF THE LITHOSTRATIGRAPHIC DESCRIPTIONS FROM OSIERS ESTATE**

The investigative record from the Osiers Estate site consists of the logs of three boreholes (CP1, CP1A, CP2) and nine window samples (WS01, WS02, WS03, WS04, WS05, WS06, WS07, WS08, WS08A; Figure 2). Window samples WS07 and WS08 were discontinued at shallow depth and are not considered further in this account. All the other window samples were put down through Made Ground to a depth of ca. 0.40m OD. Between 3.0m and 4.5m of Made Ground was encountered. Boreholes CP1 and CP1A are logged as being discontinued at -1.50m OD and -1.40m OD respectively, where 'concrete' is recorded in both boreholes. These boreholes are considered separately below.

Borehole CP2 passed through 4.5m of Made Ground into dark grey clay with frequent organic remains. Below 0.60m OD the sediment became very sandy and below 0.05m OD sandy partings were recorded. This sandy alluvium rested at -0.5m OD on gravel which extended down to -2.40m OD where it rested on bedrock London Clay.

The window samples recorded generally similar sequences immediately beneath the made ground, comprising light bluish grey or light grey clays with frequent organic remains and in window samples WS01, WS04, WS05 and WS08A, occasional fine flint gravel. 'Bands of peat' were recorded in the light bluish grey clays of window sample WS01. In five of the seven window samples a downward transition was recorded either into greyish brown sediment (WS03) or into shelly material (WS01, WS05, WS06, WS08A). The level of this transition varied from 1.90m OD in WS06 and 1.50m OD in WS03 to 0.60m OD in WS08A and 0.5m OD in WS01 and WS05.

Comparison between the Morganite sequence and the Osiers Road sequences (Figure 3) indicates several significant similarities.

1. The maximum thickness of the alluvial sequences recorded at Osiers Road (3.1m in WS04) is identical with the thickness of alluvium recorded at the Morganite site.
2. The transition from organic clays at Osiers Road into shelly, and in Borehole CP2, sandy sediment is similar to the transition at the Morganite site from organic-rich silts to calcareous sands with mollusc and ostracod remains.
3. Given the recorded 3.0m overburden of Made Ground at the Morganite site, the level of the gravel surface there underlying the alluvial sequence is reduced to -0.81m OD, almost exactly the same level as the gravel surface in Borehole CP2 at Osiers Road.

These similarities need to be considered in the topographic context of the two sites, forming as they do, two parts of the same parcel of marshland – formerly Wandsworth Island. In the absence of recorded investigations in the area between the Morganite site and Osiers Road, it is not possible to be certain whether the alluvial sequences at these two sites represent accumulation in two separate creeks with an upstanding gravel area in between; or parts of the uninterrupted floodplain at the mouth of the Wandle. The historical evidence in early maps, the BGS mapping of the area and the findings from the Former Shell Oil Terminal (Perry and Skelton, 1995a) tend to support the latter alternative, but in either case the two sites appear to have experienced essentially the same sequence of development in the recorded historic period and earlier in the Holocene. The radiocarbon dating of the Morganite sequence suggests that alluvium began to accumulate there in the third millennium BC and continued to build up into the historic period. There is no obvious reason to suppose that the history of the Osiers Road site has been significantly different.

#### *Boreholes CP1 and CP1A*

These two boreholes were put down close together near the SE corner of the site. They passed through undoubted Made Ground to, respectively 1.40m OD and 3.1m OD into 'dark grey black' clay (CP1A) or sandy clay (CP1) with in both cases 'frequent organic matter'. In both boreholes the sediment became very gravelly downward at 0.4m OD (CP1) and 0.60m OD (CP1A). Both boreholes terminated when 'concrete' was encountered at -1.7m bgs (CP1) and -1.60m OD (CP1A).

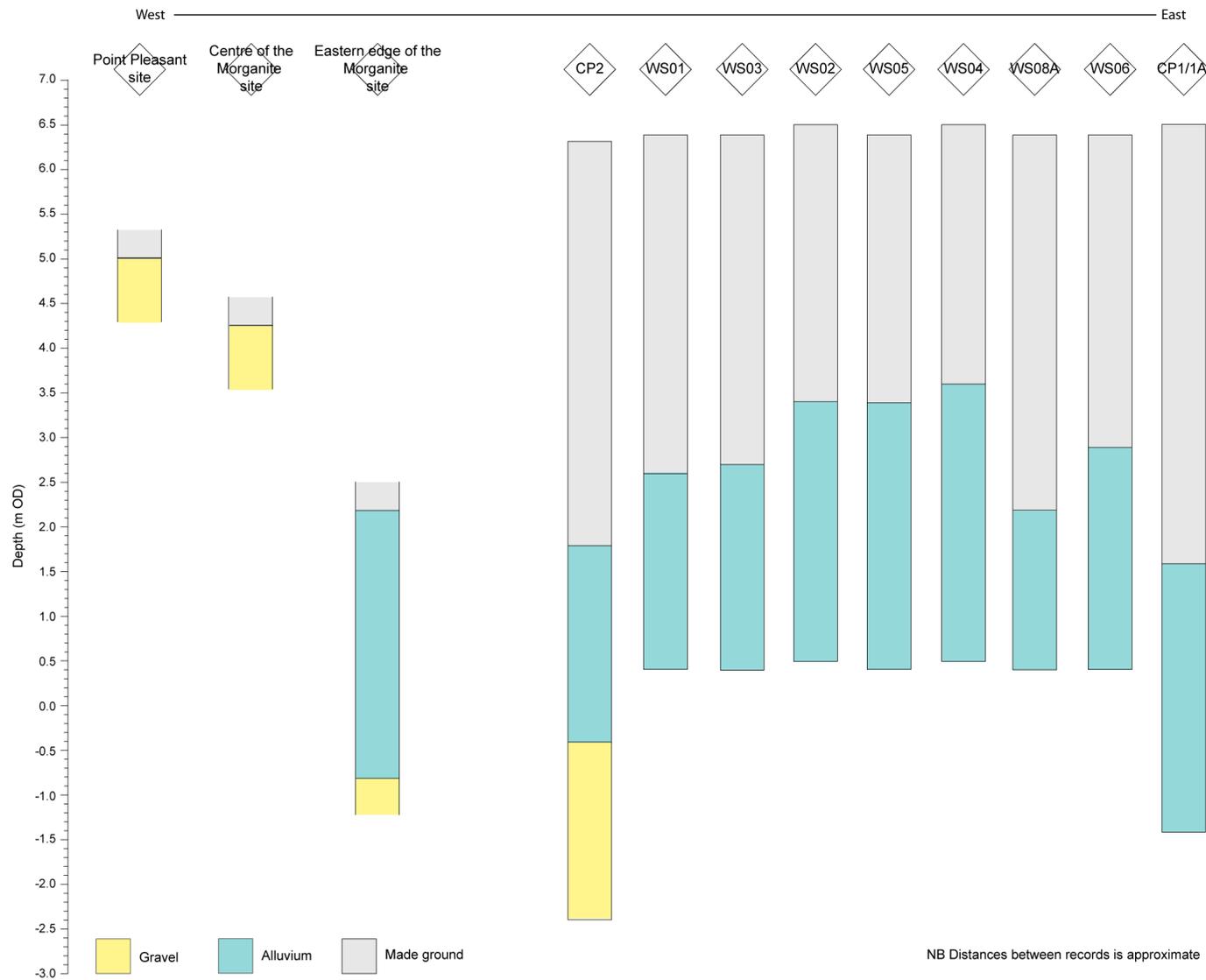
It is difficult to visualise any reason why there should be any artificial surface of 'concrete' at the depths recorded here in the lower Wandle valley. There is no record of deep excavations at the mouth of the Wandle. Industrial development of the site in the 20<sup>th</sup> century seems on the contrary to have entailed substantial ground-raising by the importation of Made Ground material.

The level at which 'concrete' was encountered in both boreholes (ca. -1.60m OD) is fairly close to the level at which the base of the gravel was recorded in Borehole CP2 (-2.30m OD) and the thickness of the 'very gravelly' sediment in the two boreholes – 2.2m in Borehole CP1A and 2.1m in Borehole CP1 is similar to the thickness of the gravel recorded in Borehole CP2 (1.9m). In addition the upper surface of the 'very gravelly' sediment (0.60 to 0.40m OD) is close to the height at which transitional conditions were recorded in several of the window samples.

In the light of the foregoing observations, it seems likely that these two boreholes encountered an indurated gravel bed immediately above the contact with the London Clay and that the sediment sequences above this level are *in situ* natural alluvium broadly similar in character to the sequences recorded elsewhere on the site. Both calcareous and ferruginous induration of fluvial gravels is quite widely recorded in the basin of the Thames and its tributaries and is often sufficiently robust to have served as a durable building material in the historic period – natural concrete.

## **RECOMMENDATIONS**

This area of the Thames has been investigated in detail (see Perry and Skelton, 1995a, b; MoLAS, 2004; Branch *et al* 2007; Jarrett *et al*, 2010), and bearing in mind the fully documented alluvial sequence from the Morganite site, only some 200m to the west of the Osiers Estate site, based on sample material that appears to have been similar to the Osiers Estate alluvial sediments in its topographic context and depositional origins, there is no obvious case for repeating such a detailed examination based on samples taken from the Osiers Estate alluvium.



**Figure 3: Simplified west-east transect of lithostratigraphic records from Osiers Estate, the Morganite site and Point Pleasant, London Borough of Wandsworth**

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