BOREHOLE SURVEY AT BECKTON NURSERY

NEWHAM WAY, BECKTON

HE BN 94

TQ 4247 8202

DAVID DIVERS

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1. INTRODUCTION

An borehole survey was undertaken by Newham Museum Services as part of the archaeological evaluation of the former site of Beckton Nursery, Newham Way, North Beckton. The work was commissioned by London and Quadrant Housing Association in advance of the redevelopment of the site, planning application number N/93/42. The survey took place between the 24th January, 1994 and the 12th of March, 1994.

The purpose of the survey was to detect archaeological deposits and features, thus establishing the optimum location for one of the evaluation trenches. In addition to this initial work, several holes were bored to confirm the continuation and orientation of a substantial linear trackway found during excavation.

2. METHOD

Boreholes were augered through the alluvium to the bottom of the peat deposits along an east-west transect across the site at 5m intervals (see Figure 2). Concrete and building rubble was encountered near the surface in some of these holes requiring their position to be moved further south. To combat this problem, small preparatory holes to be dug with a JCB mechanical digger to a depth of up to 0.80m.

The survey was carried out with a Cobra 149 percussion auger in conjunction with 5 x one meter long steel probes varying in diameter between 90mm and 38mm, a 2m long, 50mm diameter probe was also available. The widest diameter probe was used at the top decreasing to the narrowest probe at the bottom, thus allowing the auger hole to be a maximum depth of 6m.

The auger required two operatives, with a third person recording the completed probes. The deposits in each probe were recorded on proforma recording sheets which are archived with the level II excavation records at the Newham Museum Services Archaeology and Local History Centre, 31, Stock Street, Plaistow, London, E13 OBX.

Each of the deposits recorded were allocated an 'Auger Deposit Number' which are listed in the RESULTS (Appendix 2), these deposits were allocated a three digit number (e.g. 4:08), the first digit being the number of the borehole and the last two representing the deposit number within that hole. These deposits are brought together into 'Groups', these groups are composed of similar deposits which are comparable to the phases identified during excavation.

During the augering process a certain amount of compaction takes place, by applying a compaction correction factor the "true" depths of the deposits can be calculated. Only these corrected "true" depths will be quoted in this report.

3. GROUPING OF AUGER DEPOSITS

Group A

This group represents natural Thames river terrace gravels, likely to be the equivalent of the Shipperton gravels (Gibbard 1994) which appear to have been laid down between 15000 and 10000 BP. These deposits were too deep to be reached during excavation and consequently have no comparable phase.

Group B

This group represents an alluvial sandy clay up to 0.65m deep, only observed in one area (i.e. BHs 15,16 19 and 20). This represents a raised area, possibly a small island or sand bank on the Thames flood plains and was not encountered during excavation.

Group C

This group is represented by a layer of sandy peat between 0.05m and 0.30m deep that was present in most of, but not all, the boreholes that went below the deposits of Group D. This group was not observed during excavation.

Group D

This group represents a silty clay up to 0.61m deep, probably equivalent to Phase 1 identified during the excavation of Trench 2. This is confirmed in borehole 49 which was bored through the peat of Group E from within Trench 2. This provided a direct comparison between the peat and underlying deposits in both borehole and trench excavation.

Group E

This group represents a thick band of peat approximately 3m deep that occurred in all but one of the boreholes of sufficient depth. Although these deposits were subdivided into six phases (Phases 2-7) during excavation, there was no consistent observable variation across the boreholes in these deposits when viewed in the confines of the borehole auger probes. No archaeological features were positively detected. Those timbers that were seen were not confirmed to have archaeological significance.

Group F

This group is composed of peaty clays and silts and silty clayey peats that probably represents a transition period as the water level rises submerging the marshes which had formed the peat that makes up group E. This water deposited clays and silts that

have mixed with organic material often in naturally formed, slow moving water channels as recorded during excavation in Trench 1, (Phase 8). These deposits reach a maximum depth of 0.52m occurring in approximately 40% of boreholes.

Group G

This group represents silty clays with occasional thin bands of clayey peat and fine angular gravels. These were found to extend to depths where peat (Group E) would normally have been expected and probably represent natural river channels up to 5.30m deep. These had eroded their course through the peats, and in some cases, possibly through the earlier, lower clay deposits of Group H. Another possible interpretation for the shallower instances of Group G could be archaeological ditches as recorded during excavation in Trench 2, (Phase 10).

Group H

This group represents alluvial deposition of approximately 2m depth of clay. It is not clear whether this represents a few or many flooding events, but a sub-tidal or inter tidal mud flat environment seems to be the most likely to have given rise to this deposit. Although this period was subdivided into two phases during excavation (Phases 9 and 11), this distinction was not noted in the auger probes.

Group J

This group represents a soil horizon with a maximum depth of 0.50m but typically 0.2m deep. This probably results from a period of agriculture or horticulture recorded in both trenches in excavation as Phase 12. This group was represented in approximately 30% of the boreholes, its absence in the other holes is probably due to modern intrusions of the deposits that make up Group K.

Group K

This group was observed over the entire site and represents made ground composed of dumped and redeposited layers equivalent to those of Phase 14 identified in excavation. This made ground typically was 1m deep but reached up to 3.73m deep, where Group K was this deep, the modern dumps are assumed to fill large modern intrusions such as contexts 26 and 176 of Phase 14 recorded in excavation.

4. SUMMARY

The auger survey showed a generally replicated pattern of deposits across the site as was expected from the information supplied in the geotechnical borehole report (Analytical Geotechnical, 1994). What was found when boring was carried out by trained archaeologists was subtle variation in these trends, exceptions and anomalies some of which occurred only in a few isolated boreholes.

The information from the boreholes is presented as a south facing section across the entire east-west length of the site, (Figure 3). This shows the general underlying geology of the site and some of the larger features which probably all represent geological events. The natural geomorphological sequence of the site below approximately 1m of made ground which raised and levelled the ground surface as part of the ground work for development of the site.

Directly below the made ground was the early 20th century ground surface represented by a soil horizon, probably resulting from a period of agriculture or horticulture. This was absent in many of the boreholes due to modern intrusions presumably associated with the development of the site. This layer had accumulated on top of an approximately 2m depth of alluvially deposited clay which occurred fairly consistently through out the site.

Another phenomena observed in the coring were at least four deep river channels eroded through the soft peat below. These had filled up with clean, water washed gravel, silty clays and fine bands of organic material. The widest of these channels was detected in three adjacent holes (BH 36-38) therefore being at least 10m wide. The gravel deposits in this feature were clean with little or no clay or silt, this could mean that this channel was still active with water draining through it. In the coring of BH 38 at the removal of the bottom probe, methane gas was ejected under pressure probably having been trapped within the gravel fill of this river channel.

Generally, peat was found below the clay deposits, although clayey peat and peaty clays were recorded at this interface in many of the boreholes. This was assumed to be the result of initial flooding of the marshes and the occurrence of slow moving water channels that did not cut deep into the peat.

The peat itself was up to 3m deep and fairly consistently present across the site, both in terms of its depth and its nature. Wood was encountered in many of the boreholes although there were no indications or naturally occurring tree trunks, branches or roots. The recognition of human modified wood from cores would have been unlikely considering the size of observation window.

Below the peat a fairly consistent thin layer of alluvially deposited silty clay overlying a thin sandy peat deposit was found. These deposits probably represented a period of a changing environment with limited growth of vegetation followed by flooding events. These two layers had been deposited on to Thames river terrace gravels which were the earliest deposits encountered on site.

In one area a sandy clay layer was found to be deposited over the natural gravel, this layer constitutes a raised area, possibly an island or sand bank over which the later deposits lay. It is worth noting that this raised area was only observed in a group of boreholes that had been located further south to avoid a high density of rubble and concrete in the made ground (see Figure 2). This could give a misleading picture to the nature and extent of this deposit.

Another task for the borehole survey was to detect the continuation and orientation of the large trackway structure in Trench 1. A borehole was augered 0.5m south of the exposed trackway, the structure was very clearly defined in the auger probe and could not be missed. Next, four holes were bored 20m south of Trench 1 in line with the projected path of the trackway, they were spaced at one meter intervals. These were numbered BH 101-104 and their locations are shown on Figure 1. Of these, BH 102 was abandoned after hitting an obstruction less than 3m down, the other three detected a river channel (see Group G) with a maximum depth of -3.24m OD in BH 101. Peat was only detected at an appropriate depth for finding the feature in BH 103 and BH 104 but no sign of it was seen in the probes.

There are several possible explanations for this, the most likely is that the trackway is not totally straight and the projected path was incorrect, another possibility is that the river channel cut through the trackway.

5. CONCLUSION

The results of this borehole survey are of great interest in terms understanding the nature of the underlying geology, i.e. the depth and extent of various deposits and the resulting undulations in the buried landscapes. In addition to the geological layers present, large natural features and anomalies were also located and identified. These include a raised area below the peat, possibly an island and several silted up or gravel filled river channels that probably ran from the higher ground of the gravel terrace to the north, down to the River Thames to the south.

Another useful aspect of the survey is knowing the depth of made ground, including the modern intrusions, some of which were found to be over 3.5m deep. These intrusions not only ran the risk of truncating archaeological deposits and features but also of destablising the equilibrium that preserves the peat and wooden features within it. The peat, and the wood within it, are preserved by virtue of the moisture trapped in the peat by the over lying clay. Whenever intrusions cut through the clay, the moisture within the peat is allowed to escape causing the peat to dry out. Another risk to the peat is that these intrusions may become collection points for run off surface water and thus cause erosion of the peat.

Some of this information could be obtained from the geotechnical borehole report (Analytical Geotechnics, July 1994) but many of the more subtle variations of potential archaeological interest were unobserved, overlooked or misinterpreted in this technical investigation. In contrast, the percussion auger, when used by trained archaeologists, has a far greater potential for detecting and recording deposits from an archaeological perspective.

Unfortunately the borehole survey failed to positively identify the presence of archaeological features even when the boreholes were located where archaeological activity was proven to be abundant in trench excavation. It is unlikely that insubstantial structures such as many of those excavated in Trench 2 would be detected in a borehole probe. Some of the more substantial structures such as the trackway in Trench 1 would certainly be detected although the chances of actually hitting such a structure is very slim.

The survey was useful in narrowing down the options for the location of the trenches and thus maximising the potential of finding archaeological deposits and features. The location of Trench 2 was decided purely from the results of the borehole survey and significant archaeological deposits and features were found during excavation. The borehole survey was therefore a great success in achieving its main goal.

It can be concluded from this survey that boreholes can be a useful tool in the study of the alluvium along the Thames foreshore and can provide much information about the nature and extent of these deposits. Having said this, the survey has also shown that boreholes are no substitute for open area excavation and should be used as an additional tool and not as a replacement for excavation.

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