

Watching Brief Summary Report M25, Belhus Cutting, Essex (Chainage 184020-184420)

Site Code M25.027.11
by Carl Champness

Introduction

Between August and October 2011, a geoarchaeological watching brief investigated a sequence of fine-grained sediments within the Lynch Hill/Corbets Tey gravels during the widening works of the M25, between Junctions 29-30. These deposits represent a warm stage (interglacial period) palaeochannel sequence with excellent potential for palaeoenvironmental reconstruction, archaeological artefact recovery and sample recovery for scientific dating and analysis. Previously, worked flints and organic deposits were recovered during the primary construction of the M25 cutting and similar deposits of this nature have been identified and dated to the Purfleet interglacial (oxygen isotope stage 9). The current widening works presented an opportunity to further investigate these regionally important sequences using modern techniques.

Location, topography and Geology

The cutting lies to the north of the M25 Junction 30 with sloped faces to the east and west of the current carriageway. The cutting is aligned through the higher elevations of gently sloping land between 10m to 15m OD on a ridge above the river valley of the Mar dyke.

The significance of Belhus Cutting was first identified by Gibbard (1994) during his monitoring of the original M25 construction works. This investigation identified a warm stage palaeochannel sequence within the Pleistocene gravels, which was initially correlated with marine oxygen isotope 5e, the Ipswichian Interglacial (130,000 BP). However the dating has been subsequently revised by Bridgland (1994, P225-228) who correlates these same deposits with the earlier isotope stage 9, the Purfleet interglacial (300,000 BP). This earlier date to stage 9 has recently been confirmed through amino-acid dating of the marine shell recovered from the sequence.

The site was also examined by G. Ward (then of the Passmore Edwards Museum) in 1980/81 who retrieved worked flint artefacts from the sandy gravels immediately above a dark organic deposit within the gravels. The artefacts included a cleaver, at least three hand axes and some flakes in fresh condition. The organic deposits were sampled by Gibbard for palaeoenvironmental analysis from the western face of the cutting. Pollen analysis suggested a temperate riverine environment with woodland dominated by oak and pine on the drier ground (Gibbard 1994:167).

Methodology

In the first instance the existing shallow sloped sides were steepened to approximately 65° from the horizontal plane along the lower part of the cutting by machine excavation under supervision of an attending geoarchaeologist. Following this initial exposure of the sequence and assessment by a Palaeolithic sediment specialist (Francis Wenban-Smith), a series of sections at 20m intervals along the route were cleaned by hand, photographed and recorded. The machine excavation was initially undertaken using a toothed bucket followed by further reduction with a toothless bucket to aid visibility. However, at some of the selected sections the sediments became sun-baked and proved difficult to clean and examine under hand excavation conditions. At localised parts of the cutting section, ongoing ground works also made detailed examination difficult. The detailed recording of the sequence therefore concentrated on areas that combined the best sequence preservation with ease of access during the site visits.

The investigated sections were located according to the chainage markers of the current scheme and related to the OS basemap drawing in .dwg format. Each section was cleaned and described according to Jones *et al* 1999. This included information about depth, texture, composition, colour,

clast orientation, structure (bedding, ped characteristics etc), and contacts between deposits. Notes were also made of any visible microfactual material present.

Following assessment and recoding of the sediment sequences and selected sections, detailed environmental sampling was undertaken to recover material either visible or likely to survive that could record the deposition conditions and contemporary environment. This took the form of bulk, monolith and incremental samples to recover data on waterlogged plant remains, including pollen, insect remains, ostracods and mollusca. Each type of sample was taken in quantity to provide sufficient primary material for detailed analysis in the event that the initial assessment of the remains proves these to be particularly important.

Results

The general sequence of the cutting revealed a complex series of organic rich and sandy deposits that were sandwiched in between the Lynch Hill gravel deposits. The channel was 400m in width with the main organic deposits exposed towards the south of the cutting (Plates 1 and 2). The deposits ranged from loose shell rich sands to organic rich silty clays that were observed to contain plant remains and waterlogged wood.

The recorded sections along the channel revealed a sequence of deposits that covered multiple phases of channel activity, potentially representing both inter-tidal and freshwater sequences that may span a significant period of time (Plate 3). The main exposure of the channel sequence gradually dipped down to the north below the exposed cutting levels (Plate 4). However, the deposits were also observed within the drainage trenches and clearly continue at greater depth to the north. Two pieces of struck and potentially worked flint were also recovered from the channel edge deposits (Plate 5).

References

Bridgland, D.R. 1994. *Quaternary of the Thames*. Chapman Hall: London.

Charey C and Stafford, E. C. 2010 M25 Widening, Junctions 27-30, Essex. Geoarchaeological desk-based assessment of the Pleistocene geology. Oxford Arch. Unpublished client report.

Geological map 1:50 000 Sheet 257 ROMFORD (2000/1976) based on the 2nd Series 1:50 000 Map Sheet 257 dated 1976.

Gibbard, P. 1994 *Pleistocene History of the Lower Thames Valley*. Cambridge: Cambridge University Press.

Jones *et. al.* 1999. *The Description and Analysis of Quaternary Stratigraphic Sections*. Q.R.A. Cambridge.



Plate 1: An interglacial (stage 9) channel sequence identified within the Lynch Hill gravels



Plate 2: A close-up shot of the main organic rich interglacial channel sequence



Plate 3: Section (CH 184295) showing the complexity of the channel sequence



Plate 4: The organic channel deposits disappearing into the base of the section

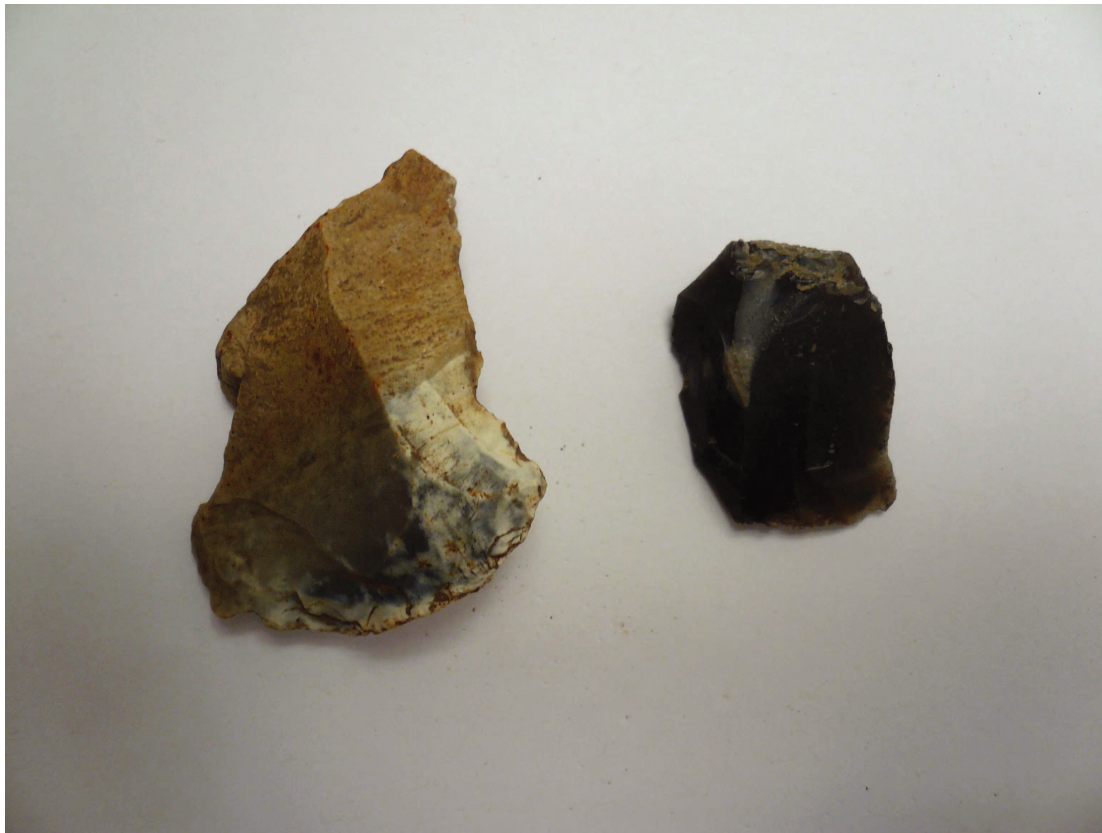
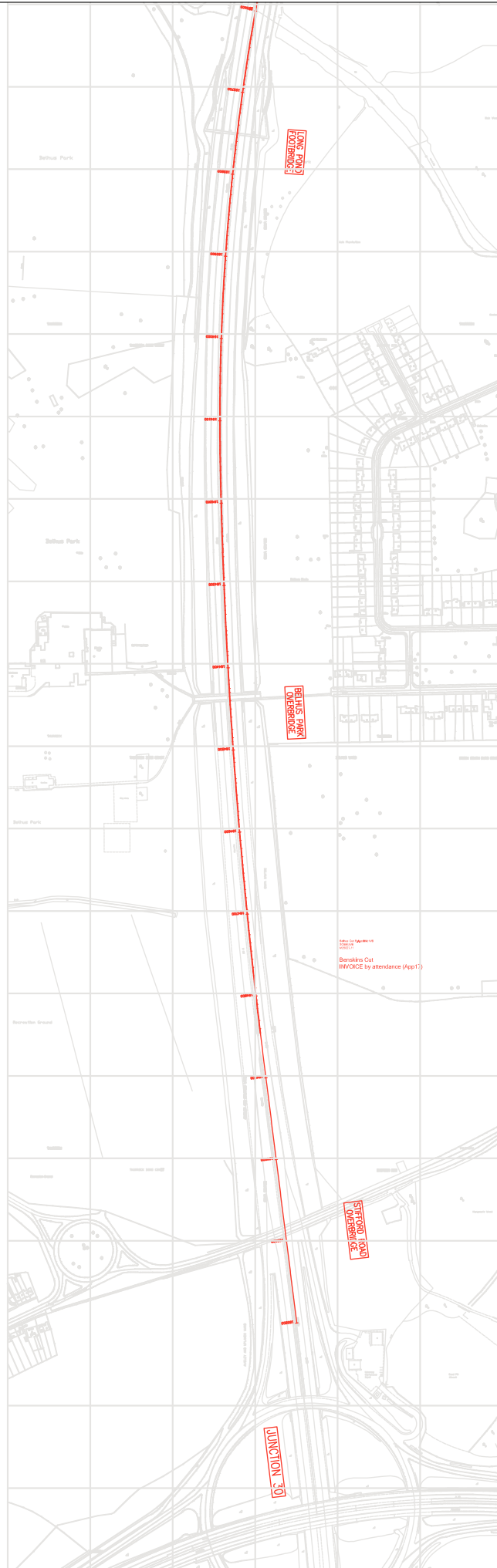


Plate 5: Two pieces of worked flint recovered from the channel edge deposits



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