

Oakmont Construction  
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04.10.18

Dear Sirs,

## Dagenham – NTT Data Centre

Further to our earlier discussions with yourselves regarding piling at the above site we have pleasure in providing additional information on the proposed piling method with regard to the potential migration of contaminants.

The ground conditions beneath this site are made ground (with some contamination), underlain by a thin veneer of made ground, gravel and thence London Clay. The base of the London Clay is at least 24m below the site level. Groundwater is present at a relatively shallow depth i.e. less than 5m depth.

Capita have proposed the use of a Continuous Flight Auger (CFA) piling systems at this site –The maximum length of the CFA piles is some 19 metres i.e. they will terminate at least 5m above the base of the London Clay.

We believe there is concern that the piling may create a pathway for the transfer of contamination present within the made ground to the lower soil horizon which is generally being protected by the low permeability stiff clay lying underneath the made ground. Such a risk is discussed in a comprehensive report published by the Environmental Agency (ref.1). There are three possible ways for the transfer of contaminants from the upper contaminated soil horizons to lower horizons and aquifers, these are:

- 1) Creating a pathway around the pile through a low permeability layer
- 2) Creating a pathway through the pile material
- 3) Driving of solid contaminant down into an aquifer during pile driving\*when Driven Piles are used)- DRIVEN PILES ARE NOT BEING USED AT SITE

The NGCLC report referred to above discusses all the above in respect to our proposed piling system and from this it could be concluded that there is little risk on this site with the use of Continuous Flight Auger Piles.

The concrete does not corrode, hence there will be no future risk of a pathway being generated by the degradation of the pile material with either system. Clearly, concrete has a low permeability that prevents the movements of contaminants through the body of the pile.

In the case of CFA Piles The driving down of solids under the pile is considered as a risk but has been generally ruled out since the material tends to move mostly upwards on the auger during pile installation rather than downwards

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The NGCLC report calls for various actions depending on the ground condition being encountered. Our assessment of the document indicates that a level B requirement is applicable to this site (Table 5.1) for both systems. Level B requires appropriate workmanship, QA/QC, risk assessments etc to be incorporated and then “this method is likely to be acceptable”. All piling systems would be applicable to at least Level B, some piling systems would fall into Level C and D.

Our assessment is based upon the following issues and we conclude beyond the NGCLC document, “likely to be acceptable”, that these systems are appropriate;

1. CFA Piles involve the boring of the auger to design depth followed by the the placing of wet pumped concrete and the removal of the auger. This pumped concrete bonds tightly with the surrounding ground.
2. The boring of the auger involves the removal of soils.
3. The use of wet concrete results in the placing of a material with a **positive** lateral pressure being exerted on the sides of the pile bore. With the positive pressure there are no voids or pathways along the soil / concrete interface.
4. The use of concrete ensures that no contaminant can flow vertically within the structure of the pile (unlike timber piles where wicking has been shown to occur).

In particular the pumping pressures are critical to the QA of the system and thus will be carefully monitored.

Furthermore Keller are able to confirm more than 30 years of activity forming piled foundations with these methods throughout the UK including numerous Thameside sites such as the the Olympic Athletic Stadium and,locally nearby Distribution Warehouses on the former Ford site-there has never been any incidence of reported ground water contamination.

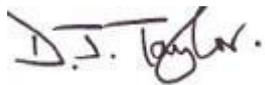
We trust this information is satisfactory, however should you require anything further please contact the undersigned.



## Reference

1. "Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination; Guidance on Pollution Prevention" produced by the National & Contaminated Land Centre report no NC/99/73. Environment Agency, 2001.  
Westcott F.J., Lean C.M.B., and Cunningham M.L.

Yours faithfully  
for **KELLER**



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