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Date: 1st November 2018

ENGIE
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Re: Herbert Road, Newport Phase 2 Plots 1-46, 56-119

Further to your request for information to satisfy planning condition 6 to demonstrate 'no resultant unacceptable risk to groundwater from inappropriate methods of piling.' At Herbert Road Newport, please find below our site risk assessment for this element.

General Contaminated Site Risk Assessment

Creation of preferential pathways through a low permeability layer to allow potential pollution of an aquifer.

Creation of preferential pathways down the pile shaft is a potential risk on any site with contaminated soils. By using driven piles, the soil will be densified as it is displaced laterally and the high soil stresses set up during driving will inhibit groundwater flow in the fill. A suitable analogy would be to compare the driving of a nail into a block of wood; the harder the wood, the more difficult it is to extract the nail because of the grip that the wood exerts.

Once piles penetrate the soft clays these cohesive soils will remould and adhere to the pile shaft and an improvement in the soil/pile shaft contact will result rather than a reduction caused by creating gaps.

This is in fact the same action that permits the effects of surcharging such soft materials to exert negative skin friction on piles in addition to the pile head load (this effect is routinely accounted for in pile design). If a "gap" had been created, there would be no negative skin friction and no need for this calculation. Furthermore, the piles are not laterally loaded (except for wind loading, which may well be resisted by friction between the underside of the pile cap and the ground) and the tops of all piles are tied together with a pile and ground beam system.

This pollution scenario is not considered to present a risk in the context of the risk assessment process carried out, which has been in accordance with government guidance.

The driven precast concrete piles proposed are capable of resisting the levels of contamination indicated, and so no significant risk exists.

It is widely recognised that driven piles displace soil laterally rather than downwards. The precast concrete pile is manufactured with a slightly convex "domed" end to the pile segment along with chamfered edges, further reducing the risk of driving down contaminants.

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As the proposed pile is precast off site, there is no contaminated of groundwater with wet concrete, cement paste or grout.

Conclusion

Should contaminants be present the choice of a driven pre-cast concrete piling system will not worsen the situation in respect of contaminated of groundwater or exposure of human beings to contaminants within the made ground.

Yours faithfully



Aaron Haslam
Design & Estimating Engineer
VAN ELLE – SMARTFOOT

