

## CASE STUDY

### HOUSING DEVELOPMENT London

#### Soil Mixing Provides Answer To Protect Piling In Contaminated Land On Multi Storey Residential Scheme

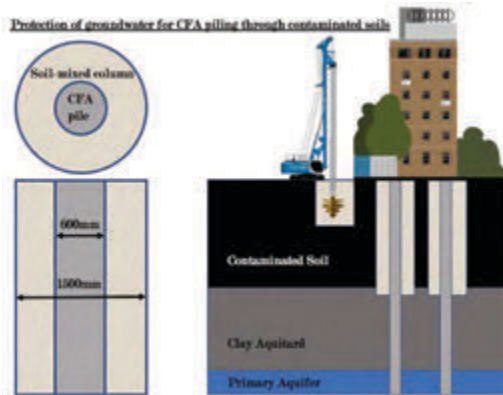
Deep Soil Mixing were asked to provide their deep soil mixing solution on a residential scheme in London where a large area on the site was found to contain large degree of contamination between from ground level - up to 10m depth.

Unfortunately, this area of the site needed to be piled for some of the multi storey residential blocks and with aquifers present deep under the site the need to prevent cross contamination pathways occurring due to the piling operations was a major concern.

#### The Solution

Deep Soil Mixing Ltd were asked to look at two scenarios of in-situ solidification of the contaminated ground to reduce potential leachate of the contaminants before piling, during piling and in the long-term occupancy of the site. Two options were initially considered:

1. Where the ground has mass contamination at a sewer level, then mass mixing of the ground was considered as the option to lock in the contaminants.
2. Where there was not such a great concentration of contamination then Individual treatment, at each pile location, was carried out using the 1500mm diameter column mixing head from ground level down to the London clay at about 5.0m depth.



# DEEP SOIL MIXING LTD

## HOUSING DEVELOPMENT, LONDON

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The Environment Agency had initially refused permission to allow the drilling/driving of piles due to the creation of preferential pathways for vertical contaminant migration from the upper contaminated made ground into the primary aquifer below. We also engaged in extensive consultation during the design and construction process with the Environment Agency to ensure that our scheme gained their approval. Our proposed solution was to install soil mixed columns through the contaminated ground at pile locations, to provide an impermeable barrier around the CFA piles when drilled through the middle of the soil mixed column.

Contaminants present in the ground were lead, naphthalene, and hydrocarbons. Before commencing on site and working with the client early in the project Deep Soil Mixing Ltd carried out mix trials as part of a feasibility study, before sending the preferred mix option to an independent lab to undertake an NEN7375 64-day tank test.

Target concentrations for the leachate were defined by a detailed quantitative risk assessment, and results of the tank test showed that the stabilised material had reduced the leaching

potential of the contaminants sufficiently for the subsequent CFA piling to be protective of the groundwater.

Using our bespoke double rotary soil mixing head deep soil mixing installed a total 210 soil mixed columns and due to the fact soil mixing doesn't create vibrations we were able to work close to adjacent building.

The rig's on-board computer continually monitored the flow of mix material to the mixing head, the depth that the mixing head is in the ground, rotational speed of the head, torque resistance on the mixing head, verticality of the column as its installed. From this data, detailed information was produced to show and validated each column's construction, the depth of column, mix flow into the column and evidence that the fact that the column was installed into the underlying clay layer.

Being able to treat the contaminated ground in-situ using soil mixing meant the developer didn't have to remove the contaminated soil to landfill. Using soil mixing minimised the need to export or import new materials thus reduced the need for off-site disposal.

## ADVANTAGES OF SOIL MIXING

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- Reduces construction programme
- No need to excavate and cart away thus reducing carbon footprint
- Zero vibration during construction
- Wide range of soils can be treated compared to other solutions
- Increases bearing pressure, controls settlement and reduces permeability

## FIND OUT MORE

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