

## CASE STUDY

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**CROSSVILLE  
CONTAMINATED LAND  
SOIL STABILISATION**  
Runcorn for Wildgoose  
Construction Ltd



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**DEEP SOIL MIXING LTD**

## CONTAMINATED LAND SOIL STABILISATION

Specialist ground engineering and soil stabilisation company Deep Soil Mixing Ltd has successfully completed a soil stabilisation project in Runcorn, Cheshire, for client Wildgoose Construction Ltd.

The site had a 4m thick cover of various contaminated material including what is known locally as "Galligu", which is a particularly difficult material to treat. In the 1950s the site was redeveloped as a bus depot but was closed in the 1980s, partly as a result of ongoing surface settlement of the Galligu.

A ground investigation study confirmed the Galligu to contain very high concentrations of arsenic and lead and to be strongly alkaline. The investigation also revealed the presence of a plume of hydrocarbon contamination emanating from the tank farm of the former bus depot. The hydrocarbons present within this plume were found to be relatively unweathered, as a result of the highly reducing conditions at the base of the Galligu and possibly also due to the high arsenic and pH level in the groundwater. In parts the Galligu had the consistency of toothpaste, whilst in other areas gypsum crystal growth had led to expansion of the Galligu and the development of zones of solid fused material.

Using their controlled soil mixing technique, Deep Soil Mixing transformed the challenging site, ensuring the extensive project could be finished to a high standard – the soil had to be stabilised and the chemicals contained in the ground locked in, before Contractors Wildgoose Construction could start work on the construction of the site which would contain a public house, restaurant, coffee house, car park and access roads.

Prior to commencement on site as with all projects Deep Soil Mixing Ltd undertake rigorous testing and assessment of the ground and its suitability for soil mixing. Laboratory tests are also undertaken using samples of the soil to be treated mixed with different proportions of a wide selection of binders to select the most appropriate mix. From these results, Deep Soil Mixing Ltd then prepare a detailed specification.

On the Runcorn project, Deep Soil Mixing Ltd installed soil mixing panels across the site as well as a soil mixed mattress and soil mixed wall next to a Major Accident Hazard Pipeline (MAHP), to lock in chemicals and prevent leachate to ensure the ground was stabilised for the building works to commence.

The site was heavily contaminated and situated in close proximity to a MAHP and an adjacent canal embankment which was unstable, so we had quite a challenge on our hands.

On this project, Deep Soil Mixing used a cutter soil mixing head as well as a soil mixing bucket.

A cutter soil mixing head is a machine used to mix the ground, particularly when needed at greater depths and in densely consolidated soils. It achieves a greater level of density compared to other soil mixing methods and is highly effective. In addition to installing the soil mixed panels, mattress and wall, the company also soil mixed the building foundations.

This project won a Brownfield Briefing Award 2018 for **Best Conceptual Design**.

## FIND OUT MORE

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