

Manky ground comes clean

Detoxifying a Manchester site means using a range of remediation techniques



EARTHMOVING

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Nobody said that redeveloping Britain's industrial past would be an easy job. Vast swathes of our towns and cities lie on ground that bears the scars, and the pollution, of this heritage.

This is something Ask Developments discovered when it embarked on a project to redevelop a five-hectare site in the centre of Manchester into the new international gateway, First Street. The £750 million project will see the site of a former gasworks transformed into office buildings, flats, bars and clubs, hard landscaped public space and a multi-storey car park.

But beneath the site lay some unpleasant surprises, including heavily contaminated ground and the buried remains of gas holders. This meant that a lot of soil would need to be moved and cleaned before Ask could get on with its ambitious project.

The company awarded Celtic Technologies a £4.8 million contract as principal contrac-

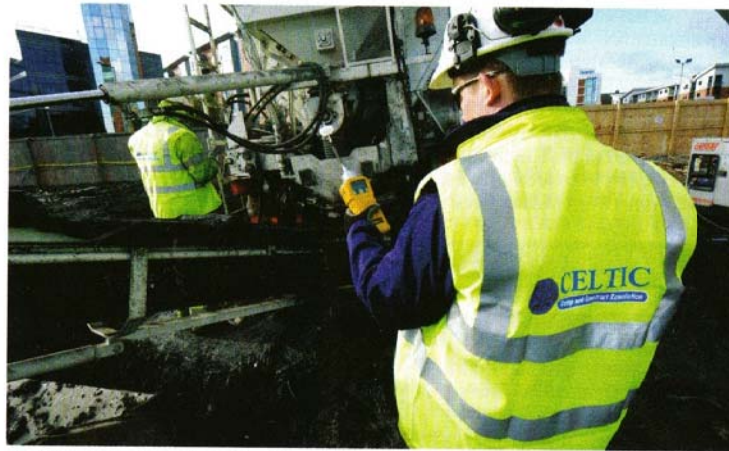
tor for remediation on the site, with a further £600,000 for surfacing work. The company went onsite last August and is currently halfway through the 44-week project.

By the programme's end, Celtic will have shifted 40,000 tonnes of earth around a central building that is currently being refurbished by Carillion. Then the company will hand over a landscaped site in a state fit to be developed in future phases.

A detailed site investigation on the land revealed five gas holders and two tar wells of varying depths, an aquifer and the remains of a redirected river. The latter can act as a channel for pollutants once they have been disturbed by the groundworks. Celtic needed to take care when it stabilised the ground, remaining mindful of the danger of releasing contaminants into the water supply.

Detailed assessment

The company also had to negotiate the problem that three of the gas holders had gas mains running beneath them. "It's not as straightforward as it could be,"



Celtic gets stuck into its decontamination and groundworks

says Celtic managing director Barry Ellis. "There was a lot of detail in the assessment and we were led to use in-situ drilling."

The company used modified Soilmec piling rigs to inject a cementitious binder into the ground above the first gas holder, which locked in the contaminants. Exploratory work on the 35-metre diameter structure revealed that it had a concave base, designed to catch coal tar, so Celtic developed a detailed map of how deep each pile needed to go, as well as the consistency of the binder. Added to this, the

holder had historically been used as a dump for waste from other gas projects in Manchester.

Stability assured

Having started work on the first gas holder, Celtic was assured that the structure was stable enough to use ex-situ methods, in which it excavates the soil and mixes in the binder elsewhere onsite.

"Different processes are down to the programme schedule and economics," explains operations director Jon Freeman. "The two methods achieve the same re-

sult in the end: a material that's bound into the soil. Where it's practical, we carry out in-situ, but ex-situ is quicker."

Celtic bulk excavates and screens the soil, sending oversized material to a crusher. Undersized goes to a batching plant where it is mixed with a cement-based additive before tipping the material back into the excavation and blading with a dozer.

Site workers also removed contaminants in the aquifer below the site using a process called multiphase extraction. A vacuum pump extracted contaminated water, which was then separated into solids, oil and water. Once the oil has been extracted, it is recycled.

When Celtic has finished its work on the First Street project in June, it will have greened up the brownfield land into prime land in the heart of the city.

The decision to clean up the soil onsite and use stabilisation techniques to lock contaminants in will have directed more than 30,000 tonnes of soil away from landfill, which Mr Freeman estimates would be about 70,000 km of truck journeys.