SUGAR HOUSE ISLAND:
Case Study

Customer:
Vastint BV UK
Contract Value:
£70M

Executive Summary

Site preparation, remediation and infrastructure of 10 hectares of former industrial land which included former gas works, printing and dye works.

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Challenges

John F Hunt Remediation undertook the role of principal contractor on the £70 million project and commenced infrastructure works in January 2017. Works included: the construction of highways and roads; services including district heating, gas and water ; the assembly, fixing, installation, maintenance & removal of temporary works; in addition to the management and coordination of site activities.

Despite the original site investigation (which included around 200 trial pits) indicating the presence of asbestos in only ten locations, as works progressed it soon became clear that more was present within the made ground than anticipated. On the discovery that the asbestos in soils issue was more widespread, the original strategy would have required the removal of 30,000m^3 of asbestos impacted soils from site to a licensed landfill, and the importation of material to compensate. The team worked hard to find solutions to mitigate the potential risk, such that they could be re-used in a safe and sustainable manner on site, with full regulatory approval.

The masterplan altered the levels dramatically across the site, with height differences on Sugar House Lane of approximately 4m from original levels. The creation of new basements and the revised infrastructure designs allowed little room for re-engineering the site. In addition, the volume of hard material to be processed for reuse on the site was unfortunately less than expected. Overall this had significant implications on the earthworks balance across the site. Innovative solutions were therefore required with regards to materials management and the sustainable re-use of materials.

The site's multiple neighbours were also a complicating factor. The River Lee Navigation and Three Mills Wall River, both used as residential moorings, run along the western and eastern boundaries of the site. Other neighbours include the House Mill, an 18th century, grade 1 listed tidal mill. Three Mills Studio is an active film studio and Three Mills Green (owned by Lee Valley Regional Park) is open to the public.

Remediation was required to be undertaken in accordance with a strict construction programme, which was designed to allow the phased completion of development areas.

Solutions

The Remedial Design was adapted to include revised re-use criteria for asbestos within soils. Implementing all relevant health, safety and statutory requirements, impacted soils were excavated under controlled conditions under an ASB5 Notification to the HSE. The soils were then treated on site and verified for re-use at depth below a capping layer, in full accordance with the updated design. The site was successfully validated on a 25m grid basis.

To overcome the shortfall in recycled aggregates, and to manage the requirements of the masterplan, the Remedial Design was also adapted to allow the stabilisation and re-use of geotechnically poor materials.

The team was able to identify re-use locations for each material type through the innovative use of Building Information Modelling (BIM).

Geotechnically modified soils were only re-used outside the designated 10m buffer zone running adjacent to the surface water receptors.

Geotechnically stabilised materials were re-used in the highways works and as part of the pile mat construction, which significantly reduced the requirement for imported recycled aggregates.

Treated materials meeting the most stringent remedial targets were placed within the identified service corridors, such that construction workers would not subjected to potential harm. These soils will not be accessible to residents or visitors.

Other treated soils, for example petroleum hydrocarbon impacted soils subject to advanced bioremediation processes, were re-used to fill deep excavations once they had been verified. Cover systems were then overlaid to create a barrier between future site users and the re-used material.

The use of BIM enabled the continuous real-time management and placement of the soils, alongside continual stockpile management and tracking to ensure regulatory compliance for re-use of treated soils, including asbestos treatment. This approach ensured that swift regulatory approval was gained to enable prompt commencement of the construction phase.

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Benefits

Due to the complex ground conditions and challenging engineering requirements, innovative solutions were required to ensure the best re-use of material at the site.

The remedial design was adapted as the works progressed, with full regulatory approval, to take into account the unexpected ground conditions relating to asbestos in soils. It is estimated that once treated in accordance with the agreed remedial strategy, these adaptions negated the need to remove 30,000m3 of impacted soils to landfill.

Due to the unexpected shortfall in concrete floor slabs and foundations, in addition to site specific engineering constraints, the design was also adapted to allow the stabilisation and re-use of geotechnically poor material for use in highways and infrastructure. It is estimated that by not needing to remove the geotechnically poor material from site and import aggregates to replace the shortfall, 2,159 tonnes of CO2 were saved.

50,000m3 of material was treated using advanced bioremediation techniques for re-use in accordance with the agreed remedial strategy. It is estimated that we saved around 5,300 unnecessary lorry movements and 1,000 tonnes of CO2 using this application

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Conclusion

Materials management and the identification of suitable re-use locations for each material type was aided by the innovative use of BIM. BIM facilitated the real-time tracking of materials from the point of excavation through to the identification of suitable re-use locations within the 3D model. This ensured that maximum re-use of materials in accordance with the approved remedial strategy. BIM also enabled the assessment of materials relative to the overall construction programme, which ensured that the works could be carried out in the most effective manner.

Overall the works have unlocked this historic site for occupation by future generations.