Stratford, East London

Scope: Earthworks | Remediation | Groundwater Treatment | BIM

Vastint

£69m

Site preparation, enabling and infrastructure works of 10 hectares of former industrial land, including gas works, an oil terminal, tar works and printing works.

John F Hunt Regeneration (JFHR) undertook the role of Principal Contractor on this regeneration project. The scope of works encompassed the following:

- Demolition
- Removal of illegally deposited and buried asbestos materials
- Remediation - soils and groundwater
- Ecological mitigation works
- Infrastructure and an adoptable highway including Section 278 and 38 works
- Substantial drainage works
- Enabling works
- Sheet piling – permanent and temporary
- Kingpost river wall (Design & Build)
- Stabilised pile mats
- Reinforced earth retaining walls / structures
- Service installation and diversions
- Traffic management
- Materials modelling and management
- Extensive use of BIM

Materials Management and Earthworks

Materials management and earthworks were complicated due to the presence of legacy infrastructure. This comprised underground storage tanks, pipelines, ducts, pits and soakaways, in addition to residual process plant associated with a former oil terminal, printing ink and tar works. Significant pollution issues were present, including dense non-aqueous phase liquids (NAPL) in the form of coal tar in soils, heavy and light hydrocarbons, solvents and creosote in the underlying gravels.

Our project team included Project and Remediation Managers, Environmental Engineers and Remediation Scientists. Supported by our Site Managers and Engineering Surveyors, they were responsible for:

- Overall earthworks;
  - Total Cut: 235,824m^3
  - Total Fill: 196,540m^3
- Volume soils treated 51,899m^3;
- Total soil stabilised / solidified 144,834m^3;
- Asbestos in soils management 25,668m^3;
- Total screened 86,051m^3; and
- Total crushed 59,346m^3 .

We undertook a carefully managed programme of selective excavation, stockpiling, management, treatment, replacement and compaction of the material under our Mobile Plant Permit and in accordance with our Materials Management Plan (MMP). We worked in accordance with the DoWCoP.

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. 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.

Asbestos

A greater volume of asbestos was discovered within the Made Ground than was indicated in initial Site Investigations; the original strategy would have required the removal of high volumes of asbestos impacted soils from site to a licensed landfill and importation of material to compensate.

The JFHR team found solutions to mitigate the potential risk, with materials re-used in a safe and sustainable manner on site, with full regulatory approval. Implementing all relevant health, safety and statutory requirements, impacted soils were excavated under controlled conditions under an ASB5 Notification to the HSE.

The Remedial Design was adapted to include revised re-use criteria for asbestos within soils, allowing 25,668m^3 of asbestos impacted soil to be treated on site and verified for re-use at depth below the capping layer.

Groundwater Treatment

Significant pollution issues were present on site including NAPL in the form of coal tar (soils and groundwater), heavy and light hydrocarbons impacted soils and groundwater; and solvents / creosote within the underlying gravels. JFHR designed and implemented a treatment

train to target the contaminants of concern. For the groundwater, this included:

- Skimming of Light and Dense NAPL utilising belt skimmers;
- Thermally enhanced (steam) injection and extraction system, which was utilised to expedite the removal of heavy / dense hydrocarbons;
- Chemical oxidation of residual dissolved phase contamination; and
- Ongoing Pump and Treat system to support construction activities.

Several techniques were used to address the shallow / unsaturated zone, which included:

- Complex sorting / processing of made ground;
- Standard bioremediation techniques (windrows);
- Advanced bioremediation techniques in addition to the use of novel fungal spores to help degrade heavy PAH and petroleum hydrocarbons; and
- Soil Stabilisation / Solidification (S/S) of impacted soils, with reuse as part of the adoptable highways works.

CCS Innovation score of 8.2. Due to the complex ground conditions and challenging engineering requirements, innovative solutions and BIM were used to ensure efficient and cost-effective re-use of material on site

We made extensive savings for the Client by adapting the remedial strategy regarding asbestos contamination, negating the removal of 25,000m^3 of impacted soils to landfill

By not needing to remove the geotechnically poor material from site and import aggregates to replace the shortfall, over 5,000 unnecessary lorry movements and 2,000 tonnes of CO_2 were saved

7,000 litres neat creosote was removed from the groundwater and approx. 50,000m^3 of soil was treated using sustainable techniques - making the project one of the largest remediation schemes in the UK