John F Hunt
REMEDIATION

Strand East, Stratford

Case Study

Achilles UVDB QUALIFIED

bb AWARDS 2017 WINNER

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UKAS MANAGEMENT SYSTEMS 015

ceca Working for Infrastructure

CL:AIRE Principal Member

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Strand East, Stratford

A significant brownfield land regeneration scheme located in East London. Once completed the 26-acre development will comprise 13No. redevelopment zones including 5No. mixed use and 8No. residential.

Acting as Principal Contractor - John F Hunt Remediation are providing a complete package of works that includes demolition, reclamation, sheet-pile construction, invasive weed control, soils and groundwater remediation, materials management, earthworks, infrastructure and highway construction.

Scope

The site has been subjected to over a century of mixed industrial use including a tar works, boiler works, a bulk gas-oil storage facility, printing works and paint pigment works. Commercial warehouses and trade counters were amongst the most recent activities, all of which combined to create a very complex contaminant profile.

Large quantities of creosote contamination were present in the unsaturated and saturated zones, including Light Non-Aqueous Phase Liquid and Dense Non-Aqueous Phase Liquid. Other contaminates included discrete sources of petroleum hydrocarbons, pervasive heavy metals and PAH, and asbestos.

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

Stakeholder engagement and communication was paramount throughout the duration of the contract.

The Solution

John F Hunt Remediation worked in a collaborative with the multiple project stakeholders to ensure that innovation and best-practice was implemented through all stages of the process. Not only did this mean that complex contamination issues within the soils and groundwater were mitigated effectively, but the logistical issues in delivering a combined package of works were managed to the client's strict development programme.

Multiple contaminant sources were targeted as part of the remediation works. To maximise the amount of site won material available for re-use, John F Hunt Remediation undertook a carefully managed programme of selective excavation and subsequent management of approximately 650,000m^3 of site derived materials. This was combined with proven ex-situ soils treatment, including:

- **Forensic excavation** methods that provided real time delineation of material types at the excavation face prior to removal to a segregated stockpile for treatment;

- **Complex sorting and segregation** of the excavated materials including screening, crushing and further segregation of hard materials;
- **Controlled asbestos removal works** within a safe system of work to reclaim as much soil as possible, and to reassure stakeholders;
- **Careful materials management** to maximise the amount of material that was recovered for re-use;
- **Windrowing techniques** of petroleum hydrocarbon contaminated soils as a low-cost solution that was repeatable across the remediation programme;
- **Accelerated bioremediation** of creosote and PAH impacted soils using white rock fungi with special degrading properties, cultivated in our on-site laboratory, that reduced treatment times by almost 50%;
- **Engineered biopiles and Soil Vapour Extraction**, of some 50,000m^3 of materials grossly contaminated with hydrocarbons, including naphthalene;
- **Soil stabilisation** of geotechnically unsuitable material with traditional binders including Ordinary Portland Cement so that it could be used as part of the infrastructure, highways and piling platform works to replace the shortfall in recycled aggregates.

Several phases of in-situ trials and groundwater treatment works have been implemented to address the creosote contamination at depth. These have included: skimming / Pump & Treat; steam enhanced recovery and chemical oxidation.

As part of our innovative materials management and re-use approach, we utilised Building Information Modelling (BIM) to provide a link between the remediation and earthworks phases, the cut and fill model, and the forward construction platform works. We electronically tracked all material from excavation to deposition and recorded real-time data in BIM, which was used to:

- **Analyse the final building formations** to enable the strategic placement of the treated soils within our Materials Management Plan (CL:AIRE DoW:CoP);

- **Provide real time interpretation** of the of the site conditions to forecast and review the soil types relative to the remedial design / targets and determination of the suitability of each material;
- **Assess the programme risks** associated with the management of contaminated arisings from basements, undercroft parking, lift pits, piles and pile-cap works, which optimised the resources and allowed suitable placement of material;
- **Assess and manage the placement** of soils potentially impacted with asbestos within the service corridors / district heating system. As per the remedial design, soils with the lowest residual fibre content were identified to be placed within the service corridors. BIM allowed the assessment of this process in 3D across the entire site;
- **Identify monitoring locations** as permanent collection points to inform the Environmental Monitoring Plan, which formed part of the Mobile Plant Permit Deployment. This meant that relevant planning conditions were fully discharged and abortive costs were minimised.

With regards to the groundwater treatment (Pump & Treat Technology), a Water Treatment Plant was designed in-house by our engineers utilising 3D modelling to aid the design process. The system was initially designed to treat non-aqueous-phase-liquid (NAPL) and dissolved phase hydrocarbon contamination. Over the three years the WTP has been in operation, the system has undergone several design modifications to manage the changing ground conditions, complex contaminant profile and project scope.

Client – VASTINT UK Duration – Ongoing Value - £21M