



Figure 1 – Proposed Pershore Street Development



The site investigation identified heavy metal contamination within the made ground (predominantly copper and lead – ↑ 31,000 mg/kg and 19,000 mg/kg respectively). These highly elevated levels posed a significant risk to human health (ground workers and end users) and groundwater.

Bouygues commissioned Envirotreat to develop a remediation strategy for the site including a conceptual site model [CSM], obtain the necessary regulatory approvals, implement the proposed remediation strategy and gain regulatory sign off / discharge of relevant planning conditions on completion.

Envirotreat proposed advanced E-Clay Stabilisation of the contaminated made ground to address the source and pathway risks highlighted in the CSM (to protect the identified receptors). The remediation strategy was approved by the regulatory bodies.

Methodology

Envirotreat developed a holistic remediation approach for the site working closely with Bouygues and the Principal Contractor (City Demolition). It was agreed that Envirotreat would also undertake a significant proportion of the enabling groundworks following demolition, in addition to the approved remediation works. A Material Management Plan [MMP] was developed for the proposed works.

Site Background & History

The site is located off Pershore Street in the centre of Birmingham.

The site was previously occupied by the recently demolished Silver Blades Ice Rink / Bowling Alley and formerly by the Midland Tube Works. It is understood that the site levels were raised prior to construction using imported fill – this fill material was understood to be from an industrial source and is assumed to be the likely source of the identified heavy metal contamination on the site.

Planning permission was granted for development of an eleven-storey tower building incorporating 333 flats, retail units and a gymnasium / communal lounge. The proposed development is shown in Figure 1 below.

Envirotrear were engaged to carry out the following works:

- Break out / excavation of the existing floor slab and associated foundations to access source contamination (made ground).
- Reduction of site levels in accordance with the designated cut and fill requirements.
- Exportation of surplus soils offsite for recycling.
- All necessary 'temporary works' to achieve the required levels (including provision of a batter along the Pershore Street side of the site).
- Treatment of contaminated made ground for reuse on site (where required).
- Working with City Demolition to provide suitable site won material for the provision of a piling mat.

The works were carried out in accordance with the designated MMP. The floor slab and underlying foundations were removed and set aside for crushing (City Demolition) to produce a grading suitable for reuse within the piling mat. Surplus soils were generated from the underlying natural sands / gravels and from the least contaminated made ground.

Notwithstanding the constraints imposed by the relatively small size and compactness of the site, Envirotrear was able to separate the natural sands and gravels from other soils (to enable local recycling) and also able to ensure that the made ground was suitably managed / delineated (to enable the surplus soils to be disposed of at a local inert landfill facility). The phased remediation of the site is shown in Figure 2.

Figure 2 – Photograph showing phased remediation of the Pershore Street Site



In order to minimise the size of the soil stockpiles being generated around the site (necessary due to site constraints), Envirotrear treated contaminated soils *in-situ* and removed surplus material offsite as soon as practically possible. There was an implicit requirement to validate the treated soils as soon as practically possible to enable reuse on site.

Figure 3 – *In-situ* E-Clay treatment of heavy metal impacted soils.



The excavated / separated natural sands and gravels were temporarily stockpiled prior to offsite removal for recycling purposes (as shown in Figure 4 below).

Figure 4 – Stockpiling of natural sands and gravels for subsequent recycling



Temporary works were required on the site due to height differences between Pershore Street and development formation levels. Envirotreat designed and implemented temporary works to remove the surplus soils and replace with a batter comprising of inert soils (designed to be easily removed at a later date).

Figure 5 – Temporary works – Batter installed along Pershore Street Side of the Site



Working with City Demolition, Envirotreat utilized site won materials for the construction of a piling mat prior to the main development works

Figure 6 – Provision of piling mat.



The remediation and enabling works were undertaken between February and May 2016.

Validation

Representative samples from treated soils were collected and submitted to i2 Analytical Laboratories for leach testing to confirm compliance with the agreed Remediation Target Criteria [RTC] developed for the site.

The agreed RTC were Environmental Quality Standards [EQS] and Drinking Water Standards [DWS] for the respective contaminants of concern.

The leach testing results confirmed compliance with the target values.

Conclusions

The works were completely successfully by Envirotreat and the following was achieved during the remediation and enabling works

- Reuse of crushed concrete slab and foundation materials providing over 80% of the piling mat requirements
- Recovery / recycling of circa 1,000 tonnes of natural sands and gravels

- Treatment and reuse of > 4,000 tonnes of contaminated soils
- Offsite removal of circa 1,000 tonnes of surplus made ground material at a local inert waste facility

Envirotrear demonstrated through a comprehensive Validation / Verification Report on completion of the works that the remediation works had been carried out in accordance with the approved remediation strategy. The prime drivers for the remediation works were the protection of human health and controlled waters and to enable the subsequent development of the site / discharge of the relevant planning conditions – these requirements were fully achieved by the works undertaken.

Completion of Development (Construction)

The following press release was issued on the 9th January 2018:

The first new development in the Smithfield District of Birmingham has been topped out.

Councillor Peter Griffiths, Cabinet Member for Housing and Homes at Birmingham City Council, laid the final piece of roof felt at The Forum, the 333-apartment building on Pershore Street.

The £50 Million Scheme is being developed by Rockspring Property Investment Managers LLP (“Rockspring”). Bouygues UK is the Main Contractor; Linkcity is Development Manager.

The Forum is on the site of the former Silver Blades ice rink, next to the wholesale markets site and within the 14-hectare Birmingham Smithfield Perimeter. Birmingham City Council is currently spearheading plans to regenerate the area, creating new leisure, retail, hotel and cultural space, plus 2,000 new homes.

Cllr Griffiths said: “I visited The Forum 12 months ago, as the groundworks were completed and the concrete frames were going up. Developments such as this one will help

ease the housing crisis and provide much needed homes. It’s great to return to site and see the progress, including a fully fitted apartment.”

Paul Hampton, Partner at Rockspring, said: “The Forum is now watertight, a significant milestone in the construction phase. We are currently glazing and cladding the building, with full interior fit-outs set to commence in Q1 this year.”

Nicolas Guérin, Managing Director of Linkcity, said: “Having recognised this opportunity to bring the first major purpose-built development of private rented sector homes to Birmingham, we are pleased to have reached this significant milestone. We are grateful to our partners at Rockspring, and our colleagues at sister company Bouygues UK who will be continuing their hard work to bring the building to completion this summer. We are looking forward to seeing the finished product and are actively seeking further development opportunities in the West Midlands.”

Figure 7 – Topping Out



City demolition case study.

<https://www.citydemolition.co.uk/portfolio-item/the-leisure-box-birmingham-city-centre/#service-gallery>

Paragon case study.

<http://www.paragonbc.co.uk/case-studies/pershore-street>