

Irvine Harbourside Site Investigation Report Summary

Background

All developers require to undertake thorough site investigations, prior to works taking place on any site, to establish the nature and extent of the abnormal ground conditions.

The Harbourside site is classed as a 'brownfield site' as it has previously been developed. Brownfield sites have often been used for industrial or commercial purposes and therefore are likely to be contaminated. Redeveloping a brownfield site is beneficial as it can:

- improve the environment by creating a safer, healthier space
- be cost effective as vital infrastructure (e.g. local services, roads, footpaths and utilities) already exists
- boost the economy by creating jobs and increasing nearby property prices

Site Investigations

A full two stage site investigation was undertaken at the Harbourside site. The stage one desk top investigation involved analysis of the past uses of the site, including review of Ordnance Survey maps dating back to the 1800s. The purpose of this was to review available information to confirm the previous uses for the site and resulting potential for site contamination. Land on and around the site was used over the years for a variety of industrial uses, including a lime works and chemical works, and a railway line used to run through the site.

The stage two investigation provided more detailed information including:

- The type of soil present on the site
- Confirmation of any chemical contamination on the site
- Details of any gas being emitted from the ground
- The geotechnical characteristics of the site
- The requirements for different foundation types on the site
- Details of any former mining works at the site

During the process the following investigations were undertaken:

- Digging of trial pits to sample material from the site
 - Soil boreholes and well installations providing material samples and determining ground stability
 - California bearing ratio test (CBR test) to determine the strength of ground to support foundations
 - Soakaway tests to determine the speed that surface water will drain from the site
 - Chemical testing of the samples taken from the site
 - Ground water/gas monitoring to determine if any gasses are being emitted from the sub soil
- A full copy of the site investigation report is available on the Council's website. Please contact us on 01294 324031 if you have any difficulties accessing it.

Site Constraints

The following constraints were known prior to the site investigations being undertaken:

- An underground fuel tank which serviced the former Magnum Leisure Centre
- An existing electrical sub-station which requires to be relocated

As expected, several constraints were identified through the site investigations. The Council has prepared proposals and high-level costs to mitigate these. The constraints, proposed solutions and indicative costs are outlined in the table overleaf.

Constraint	Proposed Solution	Estimated Cost
Underground fuel tank	Remove underground fuel tank	£75,000
Existing electrical sub station	Relocate existing electrical sub station	£50,000
'Made ground' (the ground comprises of man-made or artificial materials and therefore has a low weight bearing capacity). Made ground is often the result of historic import of material to a site to provide a level platform for industrial works.	Piled foundations and ring beam construction	£424,800
'Made ground' indicated along the proposed road route.	Install a capping layer to roads	£49,595
Raised levels of carbon dioxide detected.	Install a gas membrane & dissipation pipework to release gasses	£106,200
Elevated metals and hydrocarbons detected within shallow soils including: <ul style="list-style-type: none"> • Arsenic • Copper • Phytotoxic Copper • Lead • Zinc • Benzo(b)fluoranthene • Benzo(a)pyrene • Dibenz(a,h)anthracene 	Install a capping layer to soft landscaped areas, geotextile and topsoil	£169,700
These types of contaminants are typical on brownfield sites where there has been a history of industrial manufacturing and processing, in particular the burning of coal on the site. Depending on the depth of the contaminants, they are typically either capped or removed.	Remove contaminated ground, where required (provisional sum)	£450,000
Total indicative cost to address all site constraints		£1,325,295

Next Steps

The information detailed in the table above will now be refined with a view to reducing costs, where possible. The Council will discuss the additional funding options which may be available to assist with these costs with the Scottish Government. The Scottish Government has a Housing Infrastructure Fund (HIF) which was specifically created to assist developers with the addressing high infrastructure costs, including addressing brownfield contaminated land. Council officers first included the Harbourside site as a potential candidate for HIF funding in 2017:

'Decontamination of the site will be required and costs have still to be estimated. The Council will investigate the level of funding required in order to address the contamination on this site and will seek infrastructure funding from the Scottish Government in order to meet this cost.' (Strategic Housing Investment Plan, published October 2017)

Remedial works will be undertaken prior to construction commencing on site by suitably qualified contractors and certification will be sought to confirm that all constraints have been safely and successfully mitigated.