Eastwood & Partners
CONSULTING ENGINEERS

E P

PHASE 1 GEOTECHNICAL AND GEO-ENVIRONMENTAL SITE INVESTIGATION

LAND AT HILL STREET, ELSECAR

FOR

MONFREDI BUILDERS LIMITED

42160-001 **7 December 2017**

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ISSUE 1

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1.0 EXECUTIVE SUMMARY

1. The site has an area of around 0.7 hectares and is located to the south west of Hill Street, in Elsecar, South Yorkshire. It is centred on grid reference 438110 400340. The site is currently used as a general storage yard for building materials. A brick building is located in the northern most corner. It is proposed to develop the site with residential dwellings.

2. Historically, the site was occupied by railway sidings and a goods shed from the early 1900s until around the late 1960s. Since this time, the site has been open land. The ground levels on the site were indicated to have been raised when the railway features were constructed. The surrounding land is currently largely residential in nature.

3. The solid geology below the site is shown to comprise strata of the Middle Coal Measures, with mudstone indicated below the majority of the site. Made ground deposits are anticipated above the natural strata.

4. A seam of coal is anticipated at shallow depth below the site, although this is expected to be thin and therefore is unlikely to have been worked. A more substantial seam is expected below the northern most tip of the site, but again this is not anticipated to have been worked in this area. However, a borehole investigation is considered prudent to confirm that workings are not present.

5. The solid bedrock beneath the site is classified as a Secondary A Aquifer. The site is not within a groundwater source protection zone.

6. No radon precautions are required at the site.

7. There are a number of former landfill sites in the vicinity of the site, although these are not expected to significantly influence the prosed development. However deep made ground may be present on site, and therefore gas monitoring may be necessary. At this stage, allowance should be made for installing gas protective measures in all plots, comprising a fully lapped and sealed gas resistant membrane and sub-floor ventilated void.

8. Traditional trench fill foundations may be suitable, depending on the depth of made ground that is present, taken through and founded within the competent natural clay at an expected minimum depth of between 900 mm and up to around 2.5 m bgl. Alternatively, if significant depths of made ground re encountered, it may be more economical to use piled foundations.

9. Deepening of the footings due to trees may be required locally.

10. At this stage, it is anticipated that precast concrete beam and block floors will be required for al plots.

11. Soakaways are not expected to be suitable as a means of surface water disposal. A piped connection will be required, with onsite attenuation.

12. Some contaminated soils may be encountered within the made ground which currently covers the site. At this stage, it is anticipated that any risk to human health and other receptors could be mitigated through the placement of 600 mm clean capping in all gardens and areas of soft landscaping.

13. Before more definite information regarding the properties of the ground and any contamination present can be given, an intrusive ground investigation will be required. This would be best undertaken by trial pits excavated using a mechanical excavator, with subsequent laboratory testing of the soils recovered. A borehole investigation is also considered prudent in order to check for shallow mining, and a programme of gas monitoring should be undertaken if deep fill is present on site.

14. The conclusions made in this report in relation to contamination are subject to agreement by the approving bodies and your warranty provider.

2.0 INTRODUCTION

2.1 Terms of Reference

This report presents the findings of a Phase 1 geotechnical and geo-environmental site investigation carried out by Eastwood & Partners (Consulting Engineers) Limited for, and behalf of Monfredi Builders Limited. Any other parties using the information in this report do so at their own risk and any duty of care is excluded.

2.2 Context

Eastwood & Partners have undertaken a contamination appraisal of a wider site in November 2014. This included the exaction of trial pits mainly on the land to the south west of this area, and chemical testing of the soils encountered. Our report reference PR/CAT/AJK/37577-001(I2) should be read in conjunction with this report.

2.3 Aims and Objectives

The aims and objectives of this investigation were as follows:

- To assimilate and review information extracted from published documentation to derive an outline conceptual model identifying potential contaminants, pathways and receptors, as well as possible linkages between these;
- To detail the expected ground conditions and their geotechnical properties enabling outline foundation proposals to be made for the proposed commercial development; and
- To outline proposals for a Phase 2 intrusive investigation, the purpose of which would be to obtain information to test the conceptual model and assess the risks to receptors as well as to confirm the foundation proposals.

2.4 Scope of Investigation

The investigation involved a review of information extracted from published documentation. Information regarding the current and former land uses both on and surrounding the site, as well as the environmental sensitivity of the location as determined by factors including geology, hydrogeology and hydrology have been examined.

Information analysed has been obtained from a variety of sources and included the following:

- A Landmark Envirocheck;
- A Coal Authority Mining Report;

- The British Geological Survey map, online map viewer and geological memoir; and
- A site walkover.

2.5 Limitations of Investigation

This report is based on the assumption that the site will be developed with residential properties which will be of traditional construction and will not exceed three storeys in height. It is assumed that private gardens will be included as well as areas of hard and soft communal landscaping, and that existing ground levels will not alter significantly. If this is not the case, then the advice given in this report may not be wholly appropriate.

Where assessments of site areas affected in particular ways are given, these are approximate. All information, comments and opinions given in this report are based on the documentary information examined. This report considers the ground and groundwater and does not cover any buildings or existing hardstanding materials. Risks to ecological receptors, such as bats, have not been considered.

3.0 THE SITE

3.1 Description

The site has an area of around 0.7 hectares and is located to the south west of Hill Street, in Elsecar, South Yorkshire. This is around 4.2 miles south east of Barnsley Town Centre. The site is centred on grid reference 438110 400340. It is very approximately rectangular on plan, the long axis being orientated approximately north east to south west. The main body of the site is relatively level, being at an elevation of around 82 m AOD. The southern edge of the site is formed by an embankment, which falls by around 5 m to properties and paddocks below.

Currently, the site is occupied by a three storey brick building in the northern corner, which is sited within a small compound made by palisade fencing. Signage on the building suggests that this was the office for a building contractor, although the building appears to predate this use and is believed to have been associated with the railway station that is adjacent, being the former station masters residence or the ticket office. A number of items of construction equipment are currently stored within the compound, including dumper trucks and an excavator.

The remainder of the site comprises open land, which is surfaced mainly with assorted gravel and occasional patches of macadam. Various building materials and containers are stored along the north western boundary. The western end of the site appears to have been regraded recently, with the area to the west of the site also having undergone a programme of landscaping. We understand that a quantity of black ash has been removed leaving colliery spoil and general granular fill. New trees have been planted along the boundary with the adjacent railway line. The ground falls towards the south.

The area in which the new houses are to be constructed is generally level. The southern boundary of the site falls as discussed above, with stone filled gabion baskets locally forming retaining walls.

Access onto the site is from Hill Street in the east, via a locked vehicular gate.

The surrounding land is occupied mainly by housing, with churches and shops also being present and a pub to the south. Elsecar railway station is located immediately north of the site. The general topography of the land around the site falls towards the south.

3.2 History

Historical Ordnance Survey maps, included with the Envirocheck, have been reviewed to assess the previous use of the site and surrounding area. The maps, together with the Envirocheck, can be found in the Appendix.

3.2.1 The Site

The earliest Ordnance Survey map, dated 1855, shows the site to be undeveloped, and to lie within an area of open fields on the edge of a settlement known as Stubbin Bottom. No changes are indicated until between 1892 and 1903, when a railway goods shed is constructed in the centre of the site. Two rail sidings are indicated running across the site from south west to north east. The sidings connect to a railway line to the west of the site, with the newly constructed Elsecar station being immediately north west of the site. All of the railway infrastructure is shown to be on a raised embankment, indicating that materials have been placed to raise the ground level. The edge of the embankment is shown along the southern edge of the site. A number of small buildings are indicated in the north most corner of the site, which are likely to be the building which remains to the present day, and were likely the station masters house. Small buildings are also sown in the north west. The maps also label a chapel as being on site, but this refers to a building on the northern side of Hill Street.

The map dated 1956 shows a platform located on the northern edge of the site. The buildings in the north of the site have been extended, and are now labelled as a booking office.

By 1968, the railway sidings, goods shed and most of the buildings have been removed. The site is now shown to be mostly clear of development, other than a track which runs across. A number of small sheds or garages are shown in the north of the site. These were removed by 1993.

No significant changes are shown by subsequent maps. Aerial photography dated 1999 shows the site to be used for the storage of building materials. We understand that the site was used as a storage compound for a construction firm around this time, until recent years when the site has been vacant.

3.2.2 The Surrounding Area

The earliest Ordnance Survey map, dated 1855, shows the surrounding area to mainly be agricultural in use, with some residential development immediately north east of the site where houses and a chapel have formed a small settlement. Milton Iron Works is shown around 450 m west of the site, and coal pits and air shafts are labelled from around 300 m south of the site, indicating underground mine workings to be in progress. Jump Pit (colliery) is also labelled around 600 m north west of the site. A second iron works is labelled around 700 m south east of the site. Railways and tramways link the collieries and the iron works.

By 1892, the settlement of Stubbin Bottom has grown around the site, with additional housing having been constructed, as well as pubs, further chapels and a small foundry around 80 m south of