GEOLOGICAL
GEOTECHNICAL
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DATA ACQUISITION
CONSULTANCY

# Site Inspection and Discovery Strategy

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| **LOCATION** | City Football Academy, Clayton Lane, Manchester, M11 4TS |
| | |
| **ISSUE DATE** | 18th July 2023 |
| | |
| **FOR** | Manchester City Football Club Ltd. |
| | |
| **CLIENT REF.** | PO: MCFC1112893 |
| | |
| **OUR REF.** | G23254-2 |

Prepared by

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## 1. Introduction

Limited development works are proposed at the above site in a single location adjacent to the first team training pitches in the east of the academy site.

The area marked for development is very small, measuring just approximately 10m x 4m with the proposed development comprising the placing of a portacabin on a concrete raft/slab foundation. This will be combined with the installation of a large elevated LCD screen above the cabin supported on posts/steelwork. It is assumed that the foundations for the screen/posts will be cast into the raft/slab foundation.

A phase 1 desk study (ref. G23254) has been issued alongside and in support of this document and should be read prior to this proposal.

The academy site previously comprised part of a chemical works complex and underwent a significant remediation exercise when developed into its current configuration (see G23254 for details).

Additionally, an intrusive shallow borehole investigation has recently been conducted by Geoinvestigate Ltd. covering several locations within the wider academy site including some geotechnical appraisal of the made ground and waste acceptance criteria (WAC) testing. This report was issued 28th June 2023 (ref. G23195) and was appended to the desk study report for the current study area (G23254).

It is currently hoped that significant intrusive phase 2 investigation works can be avoided for this small development following the recent investigation works, and that the findings of those works can be shown to be representative of the current study area.

It is proposed that the ground conditions at the site will be inspected by a geo-environmental engineer during the groundworks stage of the development, and that advice will be provided accordingly based on comparison with the findings of G23195.

It should be noted that this may result in a requirement for further intrusive (phase 2) investigation regardless, but such work might be avoidable if ground conditions are deemed to be adequately represented by the earlier intrusive investigation works.

## 2. Proposal

Three aspects of the ground will require appraisal: foundation requirements / ground strength, contamination risk / waste classification, and ground gas risk.

To do this, two elements will need to be inspected:

1. Final plans including the design and construction of the portacabin, and the proposed foundation design. A preliminary version of the latter is presented below in Figure 1. Proposed loadings will also be required.
2. Ground conditions encountered during groundworks.

Both of these will be reviewed with reference to the earlier intrusive investigation findings (G23195) and the findings of the desk study report for this study area (G23254).

Foundation Requirements / Ground Strength

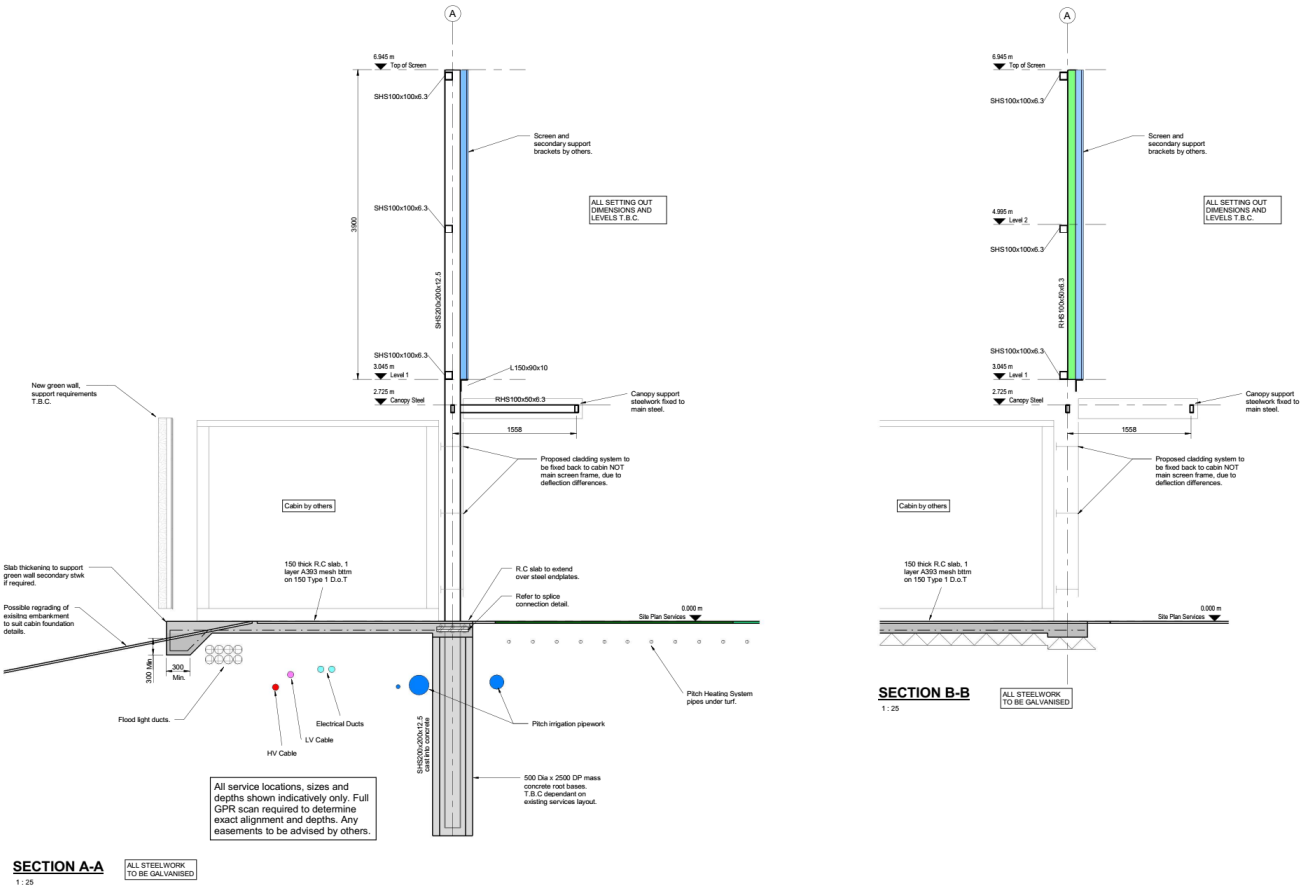
The capping layer installed across most or all of the site during the widespread remedial works has previously been found to comprise relatively low strength clay fill. It is possible that the proposed loadings will be low enough to be safely founded in this material, but this is currently unclear.

This clay capping layer, assuming it is present in the current study area, may have undergone some degree of compaction when installed. It seems reasonable to assume that at the time of development it would have been imperative that the first team training pitches would not subsequently undergo any settlement or compaction following development. The team competes at the pinnacle of the sport and benefitted from substantial financial backing at the time of the development and so a reliable, well-engineered playing surface should have been installed. Indeed, visual inspection of the pitches confirms a near-perfectly flat, level area.

As such, it is feasible that the capping layer may provide adequate support for the presumably low loadings that the new cabin will impart.

Note, however, that the posts supporting the screen are currently proposed to be seated on 2.5m deep x 500mm diameter concrete root bases. Given the nature of the structure, this design is presumably primarily to act as anchors against wind forces on the screen. Deeper fill materials elsewhere in the site were previously found to be relatively competent and so may offer sufficient support at this depth.

**Figure 1:** Proposed design details



Contamination Risk / Waste Classification

Investigation G23195 included WAC testing on representative samples of the various soil types encountered in those boreholes. Water soluble sulphate and pH testing was also undertaken to assist in concrete design (re. aggressive ground).

If the attending engineer is satisfied that the soil types encountered during groundworks for this development are sufficiently comparable to those encountered during investigation G23195, then the soil analyses carried out on those materials will be deemed to be representative of soils in the current study area.

In that instance, waste classification etc. will therefore be inferred from comparison with the previous investigation findings.

Ground Gas Risk

The extensive made ground present throughout most of the academy site might be inferred to comprise a potential source of hazardous gas.

However given the presumably temporary/prefabricated nature of the proposed portacabin, and the proposed reinforced raft/slab foundation, it is possible that the ground gas risk will in fact be low. As well as the raft/slab providing some degree of gas protection, the same is likely to be possible with the construction of the cabin itself which may include a sealed floor (for example a shipping container style cabin) and/or be supported on feet/beams which provide some degree of sub-floor ventilation (akin to a static caravan or similar).

The cabin itself will also presumably not be intended for occupation for long periods meaning the exposure risk will be much lower than in an equivalent permanent structure.

As such, a review of the proposed cabin design and inspection of the foundations may be sufficient to rule out any potential ground gas risk.

## 3. Actions to be Undertaken and Reported on

- **Inspect soils at base of slab foundation.**
  - Carry out visual inspection of open excavation(s) and determine whether soils are comparable to those encountered during G23195.
  - Speculate on whether soils at the base of the excavation comprise part of the capping layer known to be installed elsewhere in the academy site.
  - Speculate on likelihood that the soils may have been compacted.
  - Carry out limited strength testing on upper and exposed soils:
    - Hand vane shear strength tests in clay soils at and immediately below the exposed surface.
    - Dynamic cone penetrometer (DCP) tests from surface to depths of ca. 0.9m (or potentially further if deemed appropriate).

- **Review the above with respect to proposed loading requirements.**
  - Consider whether upper soils will offer sufficient support for cabin and raft/slab foundation.
  - Consider whether underlying material will offer sufficient support for 2.5m deep root base foundations for screen.
  - Comparison with findings of G23195 required – if soils are not comparable, further borehole investigation may be required. Deeper made ground exhibited reasonably good strength during G23195; consider whether reference to SPT N values of that investigation is appropriate.

- **Inspect soils recovered from all excavations to attempt to classify re. waste disposal.**
  - Comparison with findings of G23195 required.
  - If capping materials are present and of very comparable composition to those encountered in G23195, these can most likely be inferred to comprise inert waste where disposal is required.
  - If deeper grey-brown gravelly clay fill is encountered, very comparable in composition to that encountered during investigation G23195, then this can most likely be inferred to comprise hazardous waste where disposal is required.
  - Similar consideration of sulphate/pH levels may also be possible to advise on concrete classification (re. potentially aggressive ground).
  - If the encountered soils are not comparable, additional borehole investigation and/or soil sampling and analyses may be required.

- **Inspect more detailed/finalised plans for cabin and foundation design.**
  - Acquire more finalised design details of portacabin construction and proposed use/contents.
  - Consider whether encountered soils may be prone to gas generation (peat or putrescible inclusions etc.), or whether they may pose a vapour risk from potential contamination. (Consider supplementing assessment with soil organic matter (SOM) analyses if appropriate.)
  - Consider potential features of cabin and raft/slab foundation design that might offer some level of intrinsic ground gas protection and whether this might be sufficient based on the observations of soils and the proposed use of the cabin.
  - If necessary, establish the proposed use and likely occupancy periods of the cabin to support risk assessment.

**Note that the (assumed) existing capping layer should be maintained throughout the site wherever non-solid surfaces are proposed.** i.e. if excavations extend beyond the current study area (the footprint of the proposed structures), clean capping should be replaced on completion. A Minimum depth of 600mm below finished ground levels will be appropriate.

No new remedial works are anticipated to be required for the proposed development. The development area will be completely covered with new concrete hardstanding, breaking most pollutant linkages via removal of the exposure pathway.

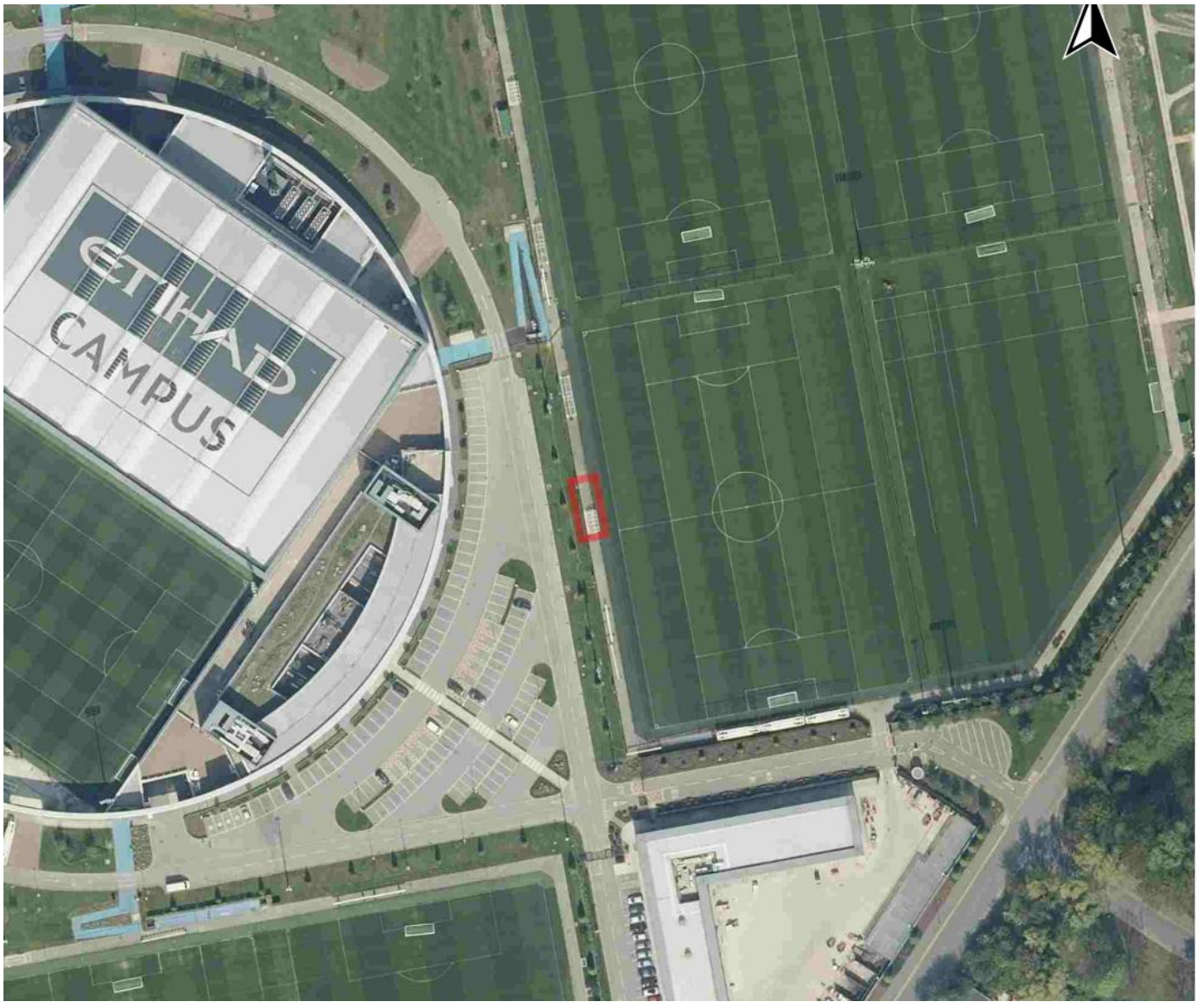
**4. Report**

Prepare a brief report summarising the findings of the site inspection against the points listed in Section 3 above, including comment on:

- Whether ground conditions are comparable to those found during investigation G23195.
- Whether the proposed foundation design is appropriate.
- Possible waste classifications and whether soils tested during investigation G23195 are representative of those in the current study area.
- Ground gas risk.
- Any requirement for further / more in-depth site investigation.

**END OF REPORT**

**Figure 2:** Study Area Location



The findings and contents of this Report pertain solely to the study area(s) outlined herein and are based solely on the findings of the excavations undertaken as part of the current exercise unless otherwise stated. The findings and/or recommendations of this report do not take into account any ground conditions that may be present but have hitherto not been encountered and as such further investigation and/or a reconsideration of the findings of this report should be undertaken if such conditions are subsequently encountered or an alternative development plan or land use is subsequently proposed.

This report considers various environmental and/or geological risks posed to the site and/or proposed development and offers advice accordingly as guidance only. The findings of this report will remain valid provided no change of ground or groundwater conditions, either natural or anthropogenic, take place and no warrantee is offered or implied.

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