# DETAILED INFORMATION

## SITE INVESTIGATIONS

### Introduction

Adequate site investigation is a requirement for the majority of works covered within this process.

The information arising from site investigations forms a key part of the assessment by the Trust of the overall submission. It is therefore important that the level and quality of information is consistent with the complexity of the proposed works. The site investigation should be sufficient to reduce the risks associated with unforeseen ground conditions to a tolerable level.

In line with industry practice, the site investigation should be under the overall supervision of a competent Ground Specialist, who should have appropriate experience of the type of development proposed. The investigation must be carried out to the standards defined in BS 5930:1999+A2:2010 *Code of practice for site investigations,* as a minimum: where a departure from the standard is used, justification must be provided. Soil testing must be carried out to BS1377 (1990), by a UKAS accredited laboratory.

Attention is drawn to the fact that, for the purposes of the Construction (Design and Management) (CDM) Regulations, site investigation is considered to be a construction activity.

Compliance with the regulations, and all other legal requirements, must be ensured by the developer.

### Geotechnical Desk Study

The site investigation should include a desk study phase, which should include a walk-over survey of the site. It is often found that reference to historic maps provides useful information on the history of development of a waterway site, particularly in more developed areas. A useful interactive website which can be used to supplement further desk study is http://magic.defra.gov.uk/

The desk study should include:

- an initial ground model
- recommendations for further investigation as appropriate, to further define the ground model

 a preliminary geotechnical hazard list and risk register, which should be updated throughout the later phases of investigation.

**Ground Investigation**

Prior to commencing the ground investigation, all borehole/ trial hole positions and accesses

should be discussed with the Technical Manager, and checked for positive identification of any services or other underground structures. A check should also be made for recorded archaeological sites, and the listed status of any structures which may be affected, together with any land designation (such as SSSI status). Details of the proposed investigation, together with any environmental or heritage impacts, must be included in the environmental appraisal for the site.

Care should be taken not to disturb wildlife when carrying out any intrusive investigations (boreholes, trial pits, etc). Of the wildlife most likely to be encountered, badgers (and their setts), nesting birds, bats, water voles and all reptiles require special attention as they are all legally protected.

No borehole shall be drilled or trial pit excavated which has the potential to conflict with the integrity of the canal corridor. All such boreholes, especially those within 6m proximity of the canal, should receive the prior authorisation of the Technical Manager.

Waterway walls are not structural retaining walls, merely erosion protection. They are often up to two hundred years old. Please do not assume that canal towpaths can support borehole & window sampling rigs, many of which are bulky and difficult to manoeuvre. A prior discussion with the Technical Manager would be required prior to submitting proposals which rely upon towpath access. Approval may only be issued for lightweight plant which is physically restrained from approaching the edge of the canal. A condition survey and risk assessment will be required.

The impermeable lining to the canal should be identified, located and avoided where at all possible. However, if it will be necessary to affect the navigation channel, within the existing waterway width, for temporary or permanent works, then bed profiling for a sufficient distance either side of the works should be carried out. In such cases where it is necessary to carry out bed profiles, and/or identify bed materials, impermeable linings etc; any investigations must be agreed in detail with the Technical Manager in order to minimise the risk of damage to the canal. The Technical Manager may reserve the right to carry out these investigations using his or her own contractor at the developer’s expense.

Due to the heritage and nature of the canal environment, there is always a possibility of soil being contaminated. This should be factored into the design of any Site Investigation.

Other constraints which must be observed are:

 Unless there are safety implications, at no time shall the waterway or towpath be blocked. Signage and suitable fencing

or other barriers must be used to segregate the public from the working area and the

operation of noisy or dust-generating plant should be supervised by banksmen. Towpath closures may be permitted (with diversions) where this is the safest option.

 No plant or equipment used for the investigation works should be stored on Trust land without prior consent.

 No trial pits are to be excavated on embankment slopes below the level of the canal or within 6m of the toe of such embankments

 No water is to be pumped into or out of the canal

 No borehole or trial pit spoil or grout shall be allowed to enter the canal and all such arisings shall be removed from the Trust's property in compliance with waste management legislation

 Boreholes are to be sealed and backfilled with cement-bentonite grout of an agreed specification. Where alternative backfilling is required (for example for a particular installation), this is to be by prior agreement

 Trial pits are to be carefully backfilled and adequately compacted in layers

 Any variations from these constraints require the written agreement of the Technical Manager.

 All plant on Trust land should use environmentally friendly fuels and oils

 The contractor should give due regard to the transport of materials on

Trust property e.g. Bentonite.

**Reinstatement**

All access roads used, and fences and hedges disturbed during the investigation are to be

fully reinstated to the Technical Manager's satisfaction. The Technical Manager may reserve the right to carry out such work using the Trust's own contractor at the developer's expense.

Where it is necessary to leave apparatus such as piezometers or survey stations on the Trust's land, the design of the installations, including details of covers etc, must be acceptable to the Technical Manager. A Commercial Agreement may also be required.

**Provision of information**

Relevant logs, test data and other field information must be submitted. The preferred format is electronic (e.g. .pdf format) copies, as well as AGS data (current version). Where the submitted documents do not feature the details of the ground investigation contractors /

consultants used, these details should be provided separately.

Interpretative reports should be provided as an electronic copy (e.g. Word or .pdf) version.

All exploratory holes must be accompanied by a 12-figure national grid reference, as well as a level to Ordnance Datum.

Where it is not practical to provide levels to OD (for example where no benchmarks are present locally), then it may be acceptable to provide a relative level to an agreed datum (not water level), with a suitable witness drawing of any temporary benchmark used.

**References**

ICE (1993) ‘Site Investigation in Construction Series 1 to 4’, ICE Site Investigation Steering Group, Thomas Telford, London.