

## Document Title

Tender Specification for Ground Investigation

## Project

Medium to Low Rise Development at Ballyouster,  
Ceilbridge, Co. Kildare

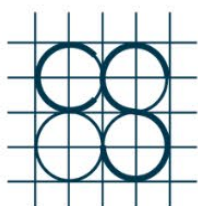
## Client

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**TENDER SPECIFICATION FOR GROUND INVESTIGATION**

**MEDIUM TO LOW RISE DEVELOPMENT AT BALLYOUSTER, CEILBRIDGE, CO. KILDARE**

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## **1.0 INTRODUCTION**

Ground investigations are required to evaluate the ground conditions at residential development lands in Celbridge for the Land Development Agency (LDA). The investigation will provide necessary geotechnical data for design and construction according to the relevant guidelines and standards.

The Scope of the Works shall be the Specification and Related Documents for Ground Investigation in Ireland, published by The Institution of Engineers of Ireland, 2nd Edition 2016 and all information, amendments, and additions. Reporting and testing to be in accordance with Eurocode 7 - Part 2: Ground Investigation & Testing (EN 1997-2:2007)

### **1.1 Site Location**

A site plan is attached, appendix A, for reference identifying the site area (red outline). The site access can be obtained via the public roads. Site visits can be facilitated by the LDA as part of the tender process. The contractor should visit the site to review access requirements and site constraints prior to submission of their tender. Any claims or variations during the work because of a claim of site access or conditions will not be entertained.

## **2.0 GROUND INVESTIGATION REQUIREMENTS**

### **2.1 Health and Safety.**

The Contractor shall satisfy themselves as to the required health and safety measures and submit a health and safety plan prior to commencing the works. The site all works are to be made safe and secure during and on completion of the works.

Contractors to possess an up-to-date Safety Statement in accordance with Section 20 of the Safety, Health, and Welfare at Work Act, 2005.

The Contractor is required to fulfil the role of PSCS for the works to be undertaken on site as part of this scope.

The Contractor is required to submit a method statement, design risk assessment, and insurances for the works prior to commencement.

The contractor is responsible for locating all underground services prior to commencement of SI Works. If clashes are identified between existing services and proposed SI Locations the contractor is to consult the relevant engineer regarding relocating SI works.

The contractor shall liaise with all utility providers and collate up to date record drawings and shall agree works methods in the vicinity of their assets. All works to be in accordance with the Utility provider's Code of Practices. Works within the hazard zone of the existing overhead power lines shall be undertaken in accordance with the ESB code of practice utilize plant which is height restricted to ensure exclusion zones are not breached.

## 2.2 Purpose and Scope of the Contract

The site investigation and laboratory testing will be used to obtain detailed information on soil and groundwater conditions on the site, to evaluate engineering parameters for the detailed design for the development and to identify any other relevant geotechnical constraints that could have an impact on the detailed design for the scheme. The aim of the ground investigation is also to determine the characteristics of the soils and to assess their potential for re-use in the works as stabilised structural fill.

Details of the scope are shown on the contract drawing included in Appendix A. The ground investigation Works shall include the following:

1. Setting out of all exploratory holes by means of ITM, or similar to give a better than 0.01m positional accuracy to the scheduled location
2. Trial Pits: 117 No. trial pits mechanically excavated to the specified depth or refusal at shallower depths with a minimum 13 tonne mechanical tracked excavator. Photos of the trial pits shall be taken as per the IEI Specification. Trial pit to min. 3.5m in depth.
3. 117 locations of Dynamic probing and spt's at 1m depths to min. 4.0m in depth to establish the interpretive bearing capacity for foundation and ground floor slab design, and spt's results at 1m depths.
4. Environmental Samples within the Trial Pits at 1.0m depths, min 2 samples for (1m and 2m depth) 50% and 4 samples for (1,2,3 and 4m depth) 50%, locations of deeper sample extraction to be confirmed on site.  $117/2 \text{ locations} \times 2 = 117 \text{ number samples} + 117/2 \text{ locations} \times 4 = 234 \text{ number samples}$ . Total 351 samples from pitting.
5. 10 No. Rotary core boreholes and spt's (1m intervals) to establish the interpretive bearing capacity for foundation design (to min. 12m). Provide logs of the engineering geological descriptions of the soils and rock cores with photos and details of the bedding/discontinuities and TCR, SCR, RQD and Fracture index. Where rock is encountered a rotary core of 2m into competent rock shall be retrieved.
6. Environmental Samples from the Boreholes at 1.0m depths, min 4 samples per location. 4 x was sampling per location 10 over the first 4m depth of the borehole.  $10 \text{ locations} \times 4 = 40 \text{ number samples}$ . samples.
7. Allow for lockable standpipes to monitor ground water and gas levels. Allowance For 6 Number Site Visits (6 months) to Report Back On Water Table And Gas Levels, at 1 months intervals.
8. CBR: 20 No. tests determined by Plate Bearing Test, at locations indicated on drawings at 0.5m depth. Provide recommendations for CBR design value for road construction.
9. 10 No - Infiltration Tests (BRE365) to be carried out in accordance with BRE Digest 365 & SUDS Manual, in locations indicated on the attached drawings, to determine permeability of subsoil. Test Pits to expose and record profile of ground to depth of 1.5m (test level), with a description of ground encountered logged as per trial pits.
10. 58m of Slit Trenches (ST) to be carried out to determine the position, layout and depths of existing underground services, record ground conditions and confirm the depth, elevation (to OS

datum), and location (to ITM co-ordinates) at which each service is encountered. Contractor to provide a full report including a detailed log/drawing of each trench (in plan and cross section and with supporting .dwg file), drawn up in accordance with the Client's requirements.

11. Dig Plan - A site plan is to be provided for the full site as per the testing locations outlining an excavation plan at 1m, 2m and then to 3m, 4m for the site where the samples were extracted at deeper locations and the material classification for each zone of testing on the site.
12. GEOTECHNICAL REPORT - The reporting should provide commentary on; Interrupted Allowable Bearing Capacity & Foundations Formation Levels/ Ground Bearing Slab - Bearing Capacity & Formation Levels / Groundwater levels and ground water strikes/ Infiltration /Slopes stability / Pavement Construction / Buried Concrete / made ground / Earthworks Testing.
13. WASTE CLASSIFICATION REPORT - Waste Acceptance Criteria [WAC] & Environmental Testing and Soils / domain classifications destined for Landfill. Laboratory analysis (RLTA Suite) is to be reviewed and categorised under waste classification (Waste Haz-online) legislation & reviewed under Waste Acceptance Criteria, (WAC analysis for landfill disposal). A waste characterisation assessment report of the samples in accordance with the Environmental Protection Agency (EPA) Guidelines on the Classification of Waste (latest edition) is to be provided. The interpretive report to be provided is to categorise the material on site in accordance with the Waste Classification Categories as per the example tables below;

| Waste Category                                    | Classification Criteria                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category A<br>Unlined Soil Recovery<br>Facilities | Soil and Stone only which are free from <sup>7</sup> anthropogenic materials such as concrete, brock timber. Soil must be free from "contamination" e.g. PAHs, Hydrocarbons <sup>8</sup> .                                                                                                                                                              |
| Category B1<br>Inert Landfill                     | Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002).<br>Results also found to be non-hazardous using the HWOL <sup>9</sup> application. |
| Category B2<br>Inert Landfill                     | Reported concentrations greater than Category B1 criteria but less than IMS Hollywood Landfill acceptance criteria, as set out in their Waste Licence W0129-02.<br>Results also found to be non-hazardous using the HWOL application.                                                                                                                   |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category C<br>Non-Haz Landfill     | Reported concentrations greater than Category B2 criteria but within non-haz landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002).<br>Results also found to be non-hazardous using the HWOL application. |
| Category C 1<br>Non-Haz Landfill   | As Category C but containing < 0.001% w/w asbestos fibres.                                                                                                                                                                                                                                                                                                                                  |
| Category C 2<br>Non-Haz Landfill   | As Category C but containing >0.001% and <0.01% w/w asbestos fibres                                                                                                                                                                                                                                                                                                                         |
| Category C 3<br>Non-Haz Landfill   | As Category C but containing >0.01% and <0.1% w/w asbestos fibres.                                                                                                                                                                                                                                                                                                                          |
| Category D<br>Hazardous Treatment  | Results found to be hazardous using HWOL Application.                                                                                                                                                                                                                                                                                                                                       |
| Category D 1<br>Hazardous Disposal | Results found to be hazardous due to the presence of asbestos (>0.1%).                                                                                                                                                                                                                                                                                                                      |

| Sample ID | Sample Depth (m) | HazWasteOnLine Classification | List of Waste Code | Soil Recovery Sites Screening |          |          |          |          |          |          | Landfill WAC Classification |
|-----------|------------------|-------------------------------|--------------------|-------------------------------|----------|----------|----------|----------|----------|----------|-----------------------------|
|           |                  |                               |                    | Domain 1                      | Domain 2 | Domain 3 | Domain 4 | Domain 5 | Domain 6 | Domain 7 |                             |
| BH01      | 1.00             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Pass     | Pass     | Pass     | Fail     | Category B1                 |
| BH01      | 1.60             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Fail     | Pass     | Pass     | Fail     | Category B1                 |
| BH01      | 2.40             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Pass     | Pass     | Pass     | Fail     | Category B1                 |
| BH01      | 3.40             | Non Hazardous                 | 17 05 04           | Fail                          | Pass     | Fail     | Fail     | Fail     | Pass     | Fail     | Category B1                 |
| BH02      | 1.00             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Fail     | Pass     | Pass     | Fail     | Category B1                 |
| BH02      | 2.00             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Fail     | Pass     | Pass     | Fail     | Category B1                 |
| BH02      | 3.30             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Pass     | Pass     | Pass     | Fail     | Category C                  |
| BH03      | 1.00             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Fail     | Pass     | Pass     | Fail     | Category B1                 |
| BH03      | 1.70             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Fail     | Pass     | Pass     | Fail     | Category B1                 |
| BH03      | 2.50             | Non Hazardous                 | 17 05 04           | Pass                          | Pass     | Pass     | Pass     | Pass     | Pass     | Fail     | Category B1                 |

14. Testing - Carry out all necessary laboratory testing to give an adequate representation of the ground conditions and the suitability of the existing subsoil for re-use, and all necessary site and laboratory testing to determine Concrete Exposure Class for chemical attack to ISEN206 Table 2 (i.e. XA1, XA2 or XA3). The methods of testing shall accord with the recommendation of BS 1377. Including;

- Particle size distribution
- Plasticity Index,
- Moisture Condition Value,
- Moisture Content,
- Organic Content
- PH Value,
- Sulphate Content (Sulphate Suite, Pyrite Testing)
- Laboratory CBR
- Water soluble sulfate content
- Sulfate content of acid extract from soil
- Sulfate content of water extracted from soil (2:1 aqueous solution)
- Sulfate content of groundwater
- Water soluble chloride content
- Acid soluble chloride
- Atterberg Limits (Liquid limit, plastic limit, and plasticity index)
- Particle Size Distribution (PSD) by wet sieve
- Sedimentation by hydrometer
- Particle density by gas jar or pycnometer

Allow for 50% of the 117 trial pit testing locations to be tested for the above parameters to give a representation of the ground conditions and the suitability of the existing subsoil for re-use.

## 2.3 Reinstatement requirements

General Operations shall be confined to the minimum area of ground required for the safe execution of the Works. The whole of the site and any ancillary works shall be left in a clean and tidy condition. On land affected by contamination, all necessary precautions to control and secure the working area shall be always taken.

### **3.0 QUOTATION**

The Quotation for the works shall include:

Priced schedule of ground investigation works and lab testing including unit rates for all items

Quotation to include Programme for the works detailing;

- The time required to begin works from date of instruction
- Duration of site works
- Time required from completion of the site works to completion of the report with recommendations for each element of the investigation such as ; Trial Pits ; Dynamic Probing etc.....

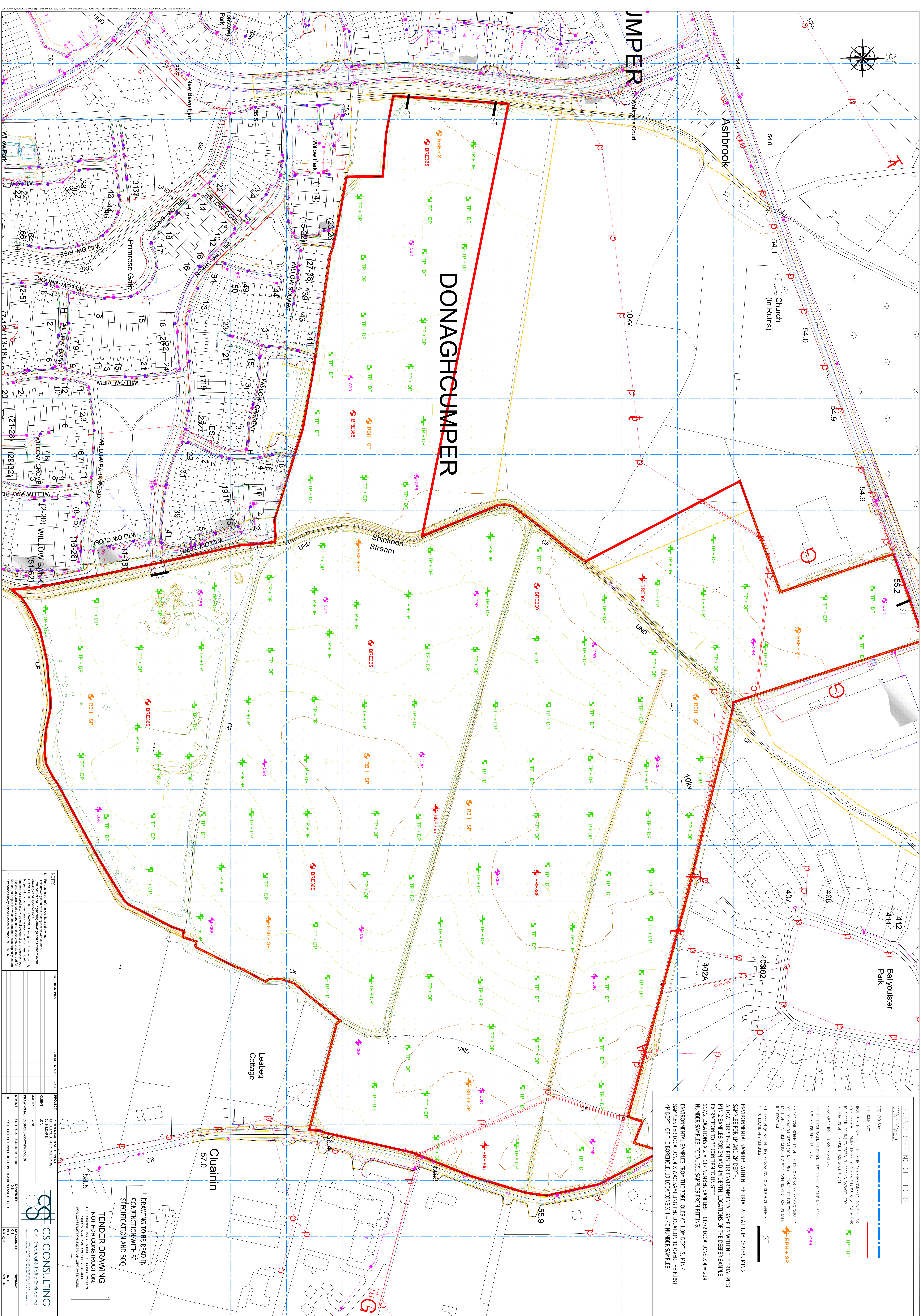
The quotation shall be submitted by the date identified in the LDA RFP.



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**APPENDIX A**  
**SITE INVESTIGATION LOCATIONS**





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