

KERRY NATIONAL ROADS OFFICE
TRALEE NORTHERN RELIEF ROAD (SECTION B)

GROUND INVESTIGATION CONTRACT
SCOPE

SEPTEMBER 2026



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TRALEE NORTHERN RELIEF ROAD (SECTION B)**Ground Investigation Contract****PART 3: The Scope****TABLE OF CONTENTS**

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Revision Control Table

For & On Behalf of MRG Consulting Engineers Limited				
Rev.	Status	Prepared By	Checked By	Date
0	Tender Issue	K. Harty	C. Sheehy	04.09.2026

The Scope

The Scope of the Works included in the Tralee Northern Ring Road (Section B) Ground Investigation Contract is as described in the following Specification, Appendices to the Specification, Pricing Document and Contract Drawings:

- **Specification**
- **Schedules**
 - Schedule 1: Information and site-specific requirements
 - Schedule 2: Exploratory Holes
 - Schedule 3: Investigation Supervisor's facilities
 - Schedule 4: Specification amendments
 - Schedule 5: Specification additions
- **Appendix I - Groundwater Standpipes and Piezometers**
- **Appendix II - Ground Gas Monitoring Standpipe**
- **Pricing Document for Ground Investigation (Annex 1)**
 - Preamble to Pricing Document
 - Pricing Document
 - Summary of Pricing Document
- **Contract Drawings**
 - 124042-GI-001

Specification

The Specification shall be the 'Specification and Related Documents for Ground Investigation in Ireland', Engineers Ireland, Second Edition 2016, Technical Specification and Bill of Quantities, as extended by the following Schedules and Appendices included in this document:

- Schedules 1 to 5
- Appendix I - Groundwater Standpipes / Piezometers
- Appendix II – Ground Gas Monitoring Standpipe – Not Used

Where there is a conflict between the information given in the Schedules and the Specification or Standards referred to in the Specification, the requirements of the Schedules shall take precedence.

Specification - Schedules

Schedule 1: Information and Site-Specific Requirements

S1.1 Name of Contract

The contract shall be named the ***“Tralee Northern Relief Road (Section B) – Ground Investigation Contract”***.

S1.2 Investigation Supervisor

The Investigation Supervisor shall be:

Kevin Harty
MRG Consulting Engineers Limited
4 Day Place
Tralee
Co. Kerry

Email: kevin.harty@mrq.ie

Tel.: 087 - 2388845

The Investigation Supervisor shall have delegated powers to amend schedule depths, exploratory hole type, plan position and extent of field exploratory holes and surveys plus numbers and type of laboratory tests.

S1.3 Description of the Site

The proposed Tralee Northern Relief Road (TNRR) – Section B will extend over a length of c.1.25km from a new roundabout constructed on the R556 Ballybunion Road, at the western end of the recently completed TNRR – Section A, west/south west to a new junction with the Bracker O'Regan Road, c.720m west of it's existing junction with the Ballybunion Road – Refer to MRG Drawing No. 124042 – GI -001.

Much of the land along the selected route corridor for TNRR – Section B, and within which proposed Ground Investigation Works including cable percussion boreholes, rotary core boreholes, trial pits, dynamic probes and in-situ testing will be executed off-line within the route corridor comprising of moderately sloping agricultural pastureland. A small number of the dynamic probes are located in forestry towards the east of the route corridor, The slit trenches and GPR surveys are located on/adjacent to existing suburban/rural roads and will require appropriate traffic management as will access points to the route corridor from the public road.

The contractor will liaise with the Investigation Supervisor with respect to access arrangements to all Ground Investigation locations located on private lands off the public road.

The site generally is categorised as GREEN as defined by the British Drilling Association document “Guidance for Safe Intrusive Activities on Contaminated or Potentially Contaminated Land” (2008).

S1.4 Main Works Proposed and Purpose of the Contract

The Main Works comprise the construction of Tralee Northern Relief Road (Section B) and the proposed Ground Investigation Contract involves the collection, manipulation, compilation, interpretation and presentation of ground investigation data necessary to inform the design of the road construction and all associated earthworks, road embankments, drainage infrastructure and proposed structures along the selected route corridor for Tralee North Relief Road (Section B).

The subject Ground Investigations are the main intrusive investigations considered necessary to facilitate the collection of geotechnical data for the purposes outlined above. The data collected will be presented in a Ground Investigation Report (factual) prepared by the Ground Investigation Contractor as specified in Schedule S1.21.8 of this Specification.

Data captured from the Ground Investigations will be further assessed and interpreted by the Ground Investigation Contractor in the context of determining the appropriate geotechnical parameters for the design of earthworks, road embankments, pavement build-ups, drainage infrastructure and proposed structures along the selected route for Tralee North Ring Road (Section B). The materials encountered will also be considered in the context of their suitability for re-use in the construction of the Works. The conclusions of these assessments will be presented in a Geotechnical Interpretative Report in accordance with Schedule S1.21.9 of this Specification.

S1.5 Scope of Investigation

The Scope of the Works envisaged under the subject Ground Investigation Contract comprise the following:-

- a) Cable Percussion (Shell & Auger) Boring, sampling and in-situ testing;
- b) Rotary (Open Hole) Drilling without core recovery;
- c) Rotary Drilling in material other than hard strata to obtain cores and in-situ testing;
- d) Rotary Drilling in hard strata (rock) to specified depth to obtain cores and in-situ testing;
- e) Trial Pit Excavation, sampling and in-situ testing;
- f) Monitoring of groundwater levels in standpipes and piezometers;
- g) Detailed logs of the above investigations presented as described in IS EN14688-1; IS EN14689-1; and BS5930 and the Specification;
- h) Laboratory testing of soil samples for engineering properties, behaviour and suitability plus contamination assessment;
- i) Preparation of detailed Main Factual Report as per BS5930 and the Specification, together with the production of Digital Data to AGS Version 3 (1999) Format;
- j) Assessment and interpretation of the data collected in the Investigations in the context of determining appropriate parameters for the design of earthworks, road embankments and proposed structures and assessing the suitability of materials for re-use in the construction of the Works along the selected route for Tralee Northern Relief Road (Section B);
- k) Dynamic Cone Penetrometer Tests;
- l) Slit Trenches to inspect existing services/utilities;
- m) Geophysical Surveying to include Ground Penetrating Radar Survey;
- n) Provision of temporary traffic management;

The full scope of investigation and the obligations of the Contractor are to be ascertained by reference to the Contract as a whole.

S1.6 Geology and Ground Conditions

The following assessment of the site geology and ground conditions has been presented on the basis of available information. No assurance is given to its accuracy.

Solid Geology

The information presented on the 100,000 scale Geological Survey of Ireland (GSI) bedrock map of the area (Map 21 – see extract in Fig. S1.6.1 below) covering the area of the proposed TNRR (Section B) identifies an unconformity in the rock running west-east north of the R558 Bracker O'Regan Road. The younger underlying bedrock of the area north of this unconformity is identified as comprising undifferentiated shale and sandstone of Namurian Age (NAM) and is described as pale sandstone and dark shale. The older bedrock geology to the south of the unconformity is identified as comprising limestone of the DIRToge Limestone Formation and is described as bioclastic cherty grey limestone.

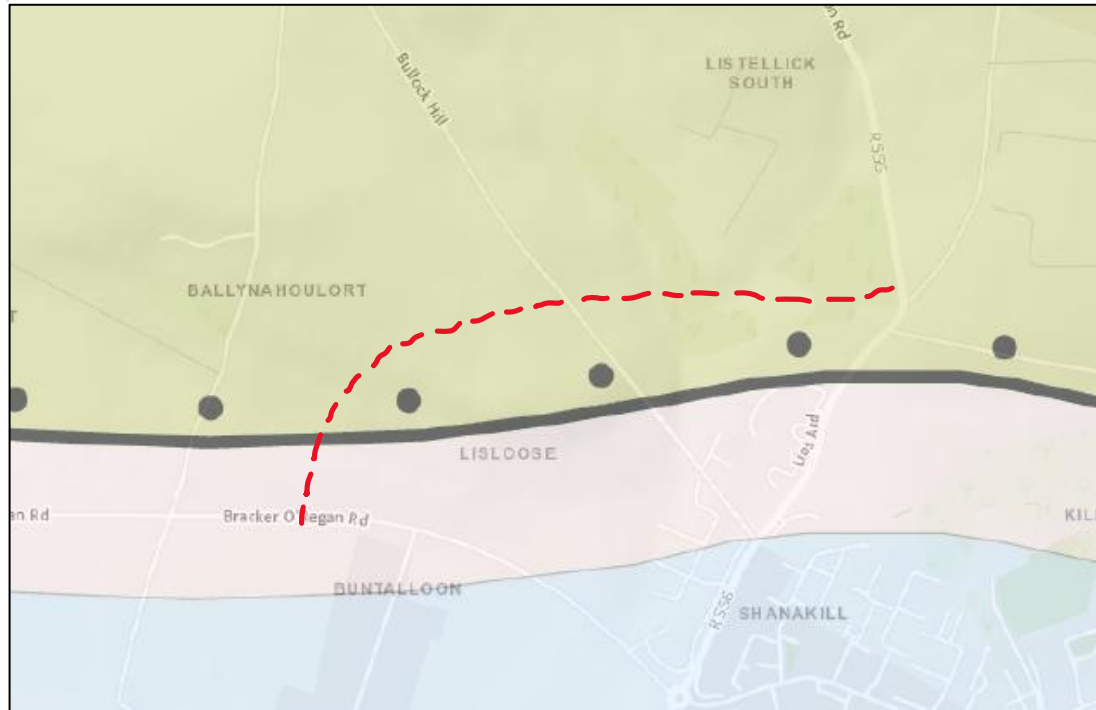


Fig. S1.6.1: Extract from Map 21 of GSI 1:100,000 Bedrock Geology Series – approx. alignment of TNNR (Section B) shown dashed red.

Quaternary Geology

The information presented on the GSI 1:50,000 scale Geological Survey of Ireland (GSI) Quaternary Sediments Map of the area identifies the ground conditions along the TNNR. Section B mostly comprises glacial till derived from Namurian sandstones and shales and varying in depth. Alluvium is present adjoining the Lisloose River.



Fig. S1.6.2: Extract from GSI 1:50,000 Quaternary Sediments Series – approx. alignment of TNNR (Section B) shown dashed red.

S1.7 Schedules of Drawing(s) and Documents

The following Volume A - Tender Drawings are included with the Tender documentation for the Ground Investigation Contract for Tralee Northern Relief Road (Section B):

- MRG Drawing No. 124042-GI-001 – Ground Investigations Location Plan

Drawing No. 124042-GI-001 shows the proposed route corridor and proposed horizontal alignment of Tralee Northern Relief Road (Section B), proposed locations of each borehole, trial pit, slit trench, dynamic probe and extent of geophysical surveys included within the Scope of the Ground Investigations Contract. Landowner boundaries and access routes to exploratory locations will be agreed with the successful tenderer prior to award of the Contract for the Ground Investigations.

The following documents are also included with the Tender Documentation for the Ground Investigation Contract for Tralee Northern Relief Road (Section B):

- Instructions to Tenderers for Tralee Northern Relief Road Section B Ground Investigation Contract
- This Volume A - Scope of Works for Tralee Northern Relief Road Section B Ground Investigation Contract
- Volume B – Tender & Schedule for Tralee Northern Relief Road Section B Ground Investigation Contract
- Volume C – Pricing Document for Tralee Northern Relief Road Section B Ground Investigation Contract
- Suitability Assessment Questionnaire including Competence as a Contractor and Competence as PSCS and Appendices A, B1, B2 & B3

The following Information Pack Drawings are included for Information with the Tender documentation for the Ground Investigation Contract for Tralee Northern Relief Road (Section B):

- MRG Drawing No. 124042-GI-101 – Mainline Longitudinal Section
- MRG Drawing No. 124042-GI-102 – Mainline Typical Cross Sections
- MRG Drawing No. 124042-GI-500 – Watercourse Crossings – Topo Layout Plan & Typical Cross Sections
- MRG Drawing No. 124042-GI-501 – Proposed Culvert No. 1 – Plan Layout & Typical Cross Sections
- MRG Drawing No. 124042-GI-502 – Proposed Culvert No. 2 – Plan Layout & Typical Cross Sections
- MRG Drawing No. 124042-GI-503 – Proposed Culvert No. 3 – Plan Layout & Typical Cross Sections

The following Information Pack documentation is also included with the Tender documentation for the Ground Investigation Contract for Tralee Northern Relief Road (Section B):

- Conditions of Contract for Short Investigation Contract PW-CF8 (v1.6 25/11/2025)
- Preliminary Health & Safety Plan

S1.8 General Requirements (Specification Section 3) Particular Contract Restrictions/Relaxations**Sequencing of Works**

All boreholes, trial pits and dynamic probe locations should be set out and marked with pegs to facilitate a walk over survey with the Investigation Supervisor to confirm locations prior to the commencement of site works.

The ground investigation programme shall ensure that all geophysical surveys be sequenced at the beginning of works. Intrusive investigations including boreholes, trial pits, dynamic probing etc. shall not progress in areas of geophysical surveys until submission of a draft geophysical survey report or long section. A sectional approach with interim draft reports may be acceptable to the Investigation Supervisor.

S1.8.1 Quality Management Systems (Clause 3.3)

All work shall be carried out in accordance with a quality management system established in accordance with IS EN ISO 9001, IS EN ISO 14001 and IS OHSAS 18001. Records to demonstrate compliance shall be made available to the Investigation Supervisor on request.

S.1.8.2 Professional Attendance (Clause 3.5.2)

Professional Attendance shall be provided by the Ground Investigation Contractor in the form of the provision of appropriately qualified and experienced professional and technical staff necessary to fulfil the technical, logistical and quality requirements of the Ground Investigation Works.

The level of Professional Attendance provided by the Ground Investigation Contractor shall be compatible with the scope and nature of the Ground Investigation Works described in this document and include the requirements identified below. All costs associated with the provision of such staff should be included in the Ground Investigation Contractor's Tender for the Works.

Principle Chartered Geotechnical Engineer/Professional Geologist (Project Director)

In order to provide the appropriate level of management of the Site Investigation Contract a Principle Chartered Geotechnical Engineer/Professional Engineering Geologist or similar approved by the Employer's Representative shall be appointed by the Contractor as Project Director to manage all aspects of the Contract as required by the Contract. The name and CV of the Principle Chartered Geotechnical Engineer/Professional Engineering Geologist (Project Director) shall be indicated in the Tender submission and shall be subject to approval by the Employer's Representative which approval may be withdrawn at any time. The Principle Chartered Geotechnical Engineer/Professional Engineering Geologist (Project Director) shall have not less than 10 years experience in ground investigation and geotechnical works, in both field operations and reporting and shall be a permanent employee of the Geotechnical Contractor.

The Principle Chartered Geotechnical Engineer / Professional Engineering Geologist (Project Director) shall be responsible for the technical direction and output of the whole investigation, including logging samples and cores, and providing preliminary borehole records, supervision of in situ tests and specialist sampling. The Principle Chartered Geotechnical Engineer/Professional Engineering Geologist shall sign the final factual report.

Project Chartered Geotechnical Engineer/Professional Geologist (Project Manager)

The Contractor shall provide full time on site, for the duration of the Ground Investigation Works, a Chartered Geotechnical Engineer/Professional Geologist, or similar approved by the Employer's Representative, with a minimum of 5 years post charter experience in similar ground investigation and geotechnical works. The Chartered Geotechnical Engineer/Professional Geologist shall be subject to the approval of the Employer's Representative but this approval may be withdrawn at any time. The name and CV of the Chartered Geotechnical Engineer/Professional Geologist shall be included in the Tender submission. The Chartered Geotechnical Engineer/Professional Geologist shall be in the employment of the Ground Investigation Contractor.

The Chartered Geotechnical Engineer/Professional Geologist will be the key member of the Ground Investigation Contractor's personnel responsible for day-to-day liaison with the Investigations Supervisor with respect to the progress and initial results of the Ground Investigations Works on site, including consultation, as appropriate, with respect to any amendments to the location or extent of investigations at individual exploratory hole locations on the basis of ground conditions encountered on site.

The Chartered Geotechnical Engineer/Professional Geologist shall prepare a daily report and perform other supervision and technical duties as required by the Contract whenever site works are being undertaken, and shall be responsible for ensuring adherence to proper excavation, sampling and in-situ testing methods and for reporting/logging and photography on site of the rock cores within 48 hours of core extraction, and ensuring all logging shall be in accordance with IS EN14688-1, IS EN14689-1 and BS 5930. This Geotechnical Engineer or Engineering Geologist shall co-ordinate the work of the other Logging Engineers, ensuring the continuity and quality of the description and approach to testing in the field and involved in the investigation.

In addition to the Chartered Geotechnical Engineer/Engineering Geologist, the Ground Investigation Contractor shall provide all other professional, technical and supervisory personnel and operatives, with the appropriate qualifications and experience, necessary to fulfil the technical, logistical and quality requirements of the Ground Investigation Works. The Chartered Geotechnical Engineer/Professional Geologist shall also be responsible for liaison with these other Geotechnical Contractor's personnel in ensuring that each exploratory hole is sunk at the position shown, unless otherwise directed by the Employer's Representative.

The Contractor's report shall refer to depths below existing ground level and use the same reference numbers as provided on the plans or as subsequently agreed by the Employer's Representative. The determination of the existing ground level and setting out and surveying the final location of all boreholes and trial pits shall be the responsibility of the Contractor.

A full set of marked up drawings showing the actual location of all: boreholes, trial pits and probes shall be provided by the Contractor and included within the Factual Report. All logs of boreholes, trial pits and probes shall state the Irish Transverse Mercator (ITM) co-ordinates and ground level related to Malin Head Datum of the final location of each exploratory hole.

Traffic Management Engineer

The Contractor shall nominate a Traffic Management Engineer, as appropriate, to coordinate safe access to the Works from the existing public roads and to develop and implement appropriate traffic management plans for Ground Investigation Works on or adjacent to the public road including slit trenching and GPR surveys on Bracker O'Regan Road and Bullock Hill Road. The Engineer shall have a valid CSCS SLG (Signing, lighting and guarding on roads) certification. This appointment shall be subject to the approval of the Investigation Supervisor.

Contractor's Foreman

At all times during the progress of works, the Contractor shall be represented on site by a competent Foreman, experienced in the type of ground investigation work to be carried out under the Contract. The Foreman shall ensure that the exploratory hole logs are at all times kept fully up to date and are available for inspection by the Employer's Representative.

S1.8.3 Provision of ground practitioners and other personnel (Clauses 3.6.1 and 3.6.2) *(Not Required)*

S1.8.4 Hazardous ground, land affected by contamination and notifiable and invasive weeds (Clauses 3.7.1 and 3.22)

The site is generally categorised as GREEN as defined by the British Drilling Association "Guidance for Safe Intrusive Activities on Contaminated or Potentially Contaminated Land" (2008).

It is noted that the habitats survey undertaken as part of the Ecological Impact Assessment for the TNRR (Section B) identified the presence of Himalayan Balsam (*Impatiens glandulifera*), an invasive plant species included on the National Biodiversity Data Centre's First Schedule of High Impact Invasive Species at two locations within the site boundary (ITM X484111, Y616892 & X484162, Y616806). This was the only First Schedule Invasive Species recorded during the site surveys.

Given the noted identification of the above referenced First Schedule Invasive Species within the site boundaries, the Ground Investigation Contractor will be obliged to identify the location and presence of this plant species within a 25m radius of any exploratory works or access routes for plant and personnel, and where such presence is identified, the Contractor will implement the appropriate biosecurity measures identified in Clause 2.3.3 of TII Publication GE-ENV-01104 December 2020 – *The Management of Invasive Species on National Roads – Standard*, and consult with the Investigation Supervisor with respect to the relocation of exploratory locations if appropriate.

S1.8.5 Additional information on services not shown on Contract drawings (Clause 3.7.2)

The Contractor shall consult with all the relevant Public Utility and Private Service owners before commencing any work in their vicinity, and shall satisfy himself as to the exact position of existing service which may affect or be affected by the Works. The Contractor shall take all measures required by any statutory undertaker for the support and full protection of all services or supplies in accordance with the relevant code of practice or special requirement of the statutory undertakers. The Contractor shall keep the Investigation Supervisor's site representative informed of such liaison and measures.

Drawings are provided in the Information Pack, see section S1.7 for drawing references.

S1.8.6 Known / suspected mine workings, mineral extractions, etc. (Clause 3.7.3)
(Not Required)

S1.8.7 Protected Species (Clause 3.7.4)

It is noted that the surveys undertaken as part of the Ecological Impact Assessment for the TNRR (Section B) identified the following protected species within and adjacent to the TNRR (Section B) Corridor. These comprised:

- Three static recorders placed during the surveys established activity of all nine bat species resident in Ireland within or in the vicinity of the TNRR (Section B) Corridor. The site was also surveyed for suitability for roosting bats. There are no structures present within the route corridor and, therefore no potential for roosting bats within structures. There are, however, several mature trees present within the project site, several of which contained potential roost features. The trees with such potential roost features are likely to still be in place during the Ground Investigation Contract, and the Investigation Supervisor will identify these to the Ground Investigation Contractor prior to commencement of the Contract Works.
- The surveys identified some badger activity including a latrine within mature hedgegrow and some badger activity recorded by a camera trap towards the west of the TNRR (Section B) corridor and a further latrine and activity recorded by a camera trap to the south of the corridor towards the east of the site. No setts were recorded within the corridor but one was recorded to the north of the corridor. The location of this sett will be identified to the Ground Investigation Contractor by the Investigation Supervisor prior to commencement of the Contract Works.
- While potential habitat for other protected species including Eurasian Red Squirrel, Hedgehog, Pine Marten, Red Deer, Irish Hare, Pygmy Shrew and Irish Stoat within or close to the TNRR (Section B) route corridor the presence of any of these species was not recorded during the surveys.
- Breeding bird surveys conducted on site as part of the Ecological Impact Assessment for the TNRR (Section B) indicated that the site is used by a range of birds that are relatively common in the Irish countryside. While some of these species are listed by Birdwatch Ireland as Birds of Conservation Interest, none are included as Annex I or II species in the Bird's Directive. Of the species recorded on site, the majority showed no evidence of using the site for breeding with wren, great tit, robin and goldfinch the only species that showed evidence of breeding on site.

The following mitigation measures will be implemented by the Ground Investigation Contractor to minimise any potential impacts on Protected Species during the Ground Investigation Contract.

- The Ground Investigation Contractor will not interfere with any mature trees identified as potential bat roost features by the Investigation Supervisor;
- From May to September, investigation works should not take place from dusk to dawn and any artificial lighting should be kept to a minimum during these periods to ensure no negative impacts of bat activity;
- No existing hedgegrows should be removed during the Ground Investigation Contract, except with the permission of the Investigation Supervisor;
- Appropriate standard noise mitigation measures will be agreed with the Investigation Supervisor and implemented during the Ground Investigation Contract Works to mitigate impacts on sensitive species.

S1.8.8 Archaeological Remains (Clause 3.7.5)

There are a number of recorded monuments located in the vicinity of the proposed TNRR (Section B) as listed in Table 1 below and identified on MRG Drawing No. 124042-GI-001.

RMP Ref.	Description	Townland	ITM Coordinates	
KE029-064	Ringfort – rath	Ballynahoulart	483201	617046
KE029-073	Ringfort – rath	Listellick South	484113	617111
KE029-073001	Souterrain	Listellick South	484102	617113
KE029-074	Ringfort – rath	Listellick South	484549	617121
KE029-085	Ringfort – rath	Garrane	484700	616928
KE029-271	Burnt mound	Ballynahoulart	483144	616408
KE029-272	Burnt mound	Ballynahoulart	483324	616412
KE029-080	Enclosure	Lisloose	483706	616458
KE029-083	Ringfort – rath	Kileen	484381	616613
KE029-084	Enclosure	Kileen	484365	616503

Table 1: Recorded monuments located in the vicinity of the proposed TNRR (Section B)

S1.8.9 Security of site (Clause 3.11)

Permanent barriers, such as those forming the boundaries between adjacent fields or different properties, should not be breached by the Ground Investigation Contractor unless clearly instructed by the Employer or investigation Supervisor. All fences, gates, walls and barriers breached or otherwise disturbed during the execution of site operations shall be immediately repaired or replaced to the same standard.

S1.8.10 Traffic Management Measures (Clause 3.12)

The Contractor will be responsible for the design of the temporary traffic management plan including the preparation of appropriate designer's risk assessments which shall be submitted to the PSDP. Any significant changes to the temporary traffic management plan shall be communicated to the PSDP. The Contractor shall nominate a Traffic Management Engineer to coordinate Works with the Client for the duration of the Contract.

The traffic management plans for Ground Investigation Works on the Bracker O'Regan and the L-6093 Doon Road shall be submitted to Kerry County Council two weeks prior to the commencement of the works.

Before commencing work on the ground investigations, the Contractor shall ascertain the requirements of Kerry County Council, and An Garda Síochána with respect to the control of traffic during construction work. The Contractor shall be responsible for all liaisons with these authorities during the progress of the works. Pedestrian traffic along footpaths/verges and pedestrian access to any place of business cannot be impeded.

The following general guidelines are issued with respect to traffic control and the Contractor must include in his rates for strict adherence to these at all times.

Site Layout, Supervision and Accident Prevention

Before any work is undertaken on or near a road by the Contractor, the Traffic Management Engineer must ensure that the following points are observed;

- (1) The Temporary Traffic Management Plan complies with Department of Transport Chapter 8 – “Temporary Traffic Measures and Signs for Roadworks” (2019).
- (2) An Garda Síochána and Kerry County Council are given at least one week's notice of the intention to commence any road works. Advance approval from Kerry County Council is required in advance of establishment of traffic management and/ or temporary diversions.
- (3) A suitable name, address and telephone number are supplied to local Gardaí and the Investigation Supervisor so that the Traffic Management Engineer may be contacted outside normal working hours in an emergency.
- (4) Conformance to conditions or times of working.
- (5) The accesses to the site have adequate sight lines and are kept clear of parked vehicles.
- (6) Advance warning signs for the works are implemented.
- (7) Only cones and signs of the prescribed shape and size are used.
- (8) Where applicable, as work proceeds along the carriageway, the signs are repositioned as required.
- (9) The lenses of lamps are kept clean and the batteries in flashing lamps are replaced before the light goes dim.
- (10) The area of the works is marked out with clearly visible barriers and that the same type of barrier is used throughout.
- (11) Signs for the works and other equipment used are kept clean and are regularly maintained.
- (12) All plant, materials and surplus excavated material are contained within the barriers.
- (13) Mud and other debris deposited on the road surface by vehicles leaving the site are removed in a timely manner.
- (14) The site is kept tidy to increase the safety factor.
- (15) Pedestrian walkways are provided and kept free from obstructions.
- (16) Local residents are considered when work is in progress outside normal working hours (ensuring that access to properties is maintained and that noise is kept to a minimum).
- (17) Workmen or visitors park their private cars away from the confines of the site remembering that their vehicles are not exempt from any parking restrictions in force locally.
- (18) All signs are removed from the carriageway when the work is complete.
- (19) Account taken of additional tourist and other traffic using roadways at weekends and Public Holidays or during sporting events.

S1.8.11 Restricted working hours (Clause 3.13)

The Contractor shall limit his working hours to:

- Monday to Friday between 08.00 hrs and 18.00 hrs.

- Saturday between 09:00 hrs and 16:30 hrs

Work on site outside of these hours will only be permitted on approval from the Investigation Supervisor.

S1.8.12 Trainee site operatives (Clause 3.14.1)
(Not Required)

S1.8.13 Contamination Avoidance and / or aquifer protection measures required (Clauses 3.15.2 and 3.15.3)

Protection of Groundwater Quality / Aquifer Protection

The Contractor shall undertake the Works in such a manner as to avoid degradation of groundwater quality either by pollution from oil spills, or contamination due to works operations. Special care should be taken to avoid any pollution when working in proximity of existing water supply wells or boreholes close to the proposed Works.

Boreholes (and trial pits intercepting shallow groundwater) are susceptible to becoming polluted by surface contamination sources. Should a proposed borehole or trial pit be located in an area where surface contamination sources are identified, the Contractor shall contact the Investigation Supervisor in good time so as to avoid or minimise standing time and permit an alternative location to be proposed (if feasible).

The drilling equipment, methodology and use of casing and grout must meet minimum environmental standards (e.g. BDA "Guidance for Safe Intrusive Activities on Contaminated or Potentially Contaminated Land" 2008; "Technical Report P5-065/TR – Technical aspects of site Investigation Volume 2 Environmental Agency, 2000) and be suitable for use in contaminated groundwater environments.

The drilling equipment and methodology should not cause pollution of groundwater. The Contractor's plant and equipment shall be free of any mechanical defects, and be well maintained so as to prevent oil or fuel leaks. The equipment used should be clean and should not introduce any polluting matter into the ground or the groundwater aquifer.

Artesian ground water conditions whenever encountered or suspected must be notified immediately to the Investigation Supervisor or his site representative and drilling suspended in accordance with Clause 4.4 of the Specification.

Boreholes which are no longer required for any purpose should be sealed (decommissioned) by backfilling with cement/bentonite grout pellets.

S1.8.14 Maximum period for boring, pitting or trenching through hard material, hard stratum or obstruction (Clauses 2.8, 4.3 and 6.4)

Where boulders, rock and other hard strata or obstructions are encountered, percussion boring using a chisel shall take place in an attempt to penetrate the obstruction and break it up sufficiently for fragments to be recovered and identified. A detailed record shall be kept of the time spent chiselling and the rate of penetration through the obstructing objects. The maximum time spent chiselling at any one obstruction shall be one hour unless expressly permitted by the Investigation Supervisor. Chiselling in hard strata will only be paid when the criteria as defined in Section 2.8 of the Specification are met.

S1.8.15 Reinstatement Requirements (Clause 3.16)

On completion of each exploratory hole all equipment, surplus material and rubbish of every kind shall be cleared away. Surplus material and rubbish shall be removed from the site to a disposal point licensed to accept the waste concerned. The whole of the site and any ancillary works shall be left in a clean and tidy condition.

Stripping, stockpiling and subsequent reinstatement of turf and topsoil at the site of and adjacent to each exploratory hole shall be undertaken in accordance with Clause 3.16.1 of the Specification.

The breaking out and subsequent reinstatement of paved areas including blacktop, concrete, etc. (other than paving slabs and blocks) shall be undertaken in accordance with Clause 3.16.2 of the Specification.

Highway reinstatement shall be in accordance with TII Publication CC-PAV-04007 – *Requirements for the Reinstatement of Openings in National Roads (May 2019)*.

S1.8.16 Hygiene facilities required (Clauses 2.21 and 3.8.4)

Welfare facilities as specified in SHWW (Construction) Regulations (2013) shall be provided by the Contractor.

S1.8.17 Unavoidable damage to be reinstated by Contractor (Clause 3.16.1)

Any unavoidable damage (e.g. rutting of access routes under normal plant passage) caused by the works should be made good by the Contractor following completion of the works.

S1.8.18 Accuracy of exploratory hole locations (Clauses 3.19 and 3.20)

Prior to commencement of the Ground Investigation Works, the position of all exploratory boreholes, trial pits and dynamic probe shall be set out by the Contractor at the location given to the nearest 1m using the survey data provided and marked with pegs to facilitate a walk over survey by the Investigation Supervisor.

The Contractor must ensure that each exploratory hole is sunk at the position shown, unless otherwise directed by the Investigation Supervisor. The Contractor's report shall refer to depths below existing ground level and use the same reference numbers as provided on the plans or as subsequently agreed by the Investigation Supervisor.

The determination of the existing ground level and setting out and surveying the final location of all boreholes and trial pits shall be the responsibility of the Contractor.

A full set of marked up drawings showing the actual location of all, boreholes, trial pits and probes shall be provided by the Contractor and included within the Factual Report. All logs of boreholes, trial pits and probes shall state the Irish National Grid (ING) co-ordinates and ground level related to Malin Head Datum of the final location of each exploratory hole.

The Contractor shall survey the exploratory holes and confirm the accurate co-ordinates to the Irish Transverse Mercator (ITM) grid and ground levels to Malin Head Datum for the final location of each exploratory hole. The location and elevation of each exploratory hole shall be surveyed with an accuracy of $\pm 0.1\text{m}$. The Contractor shall supply the Investigation Supervisor with details of the surveying equipment to be used in setting out and surveying the final location of all exploratory holes prior to setting out/surveying.

S.1.8.19 Photography requirements (Clause 3.25)

Colour photographs shall be taken and supplied by the Contractor of each exploratory hole location before commencement of works and following completion of the works. Photographs shall also be taken of the conditions of gates and other primary access routes into private property before works are commenced.

Particular requirements for photographs of cores, pits and trenches are given in Clauses 5.8 and 6.12 of the Specification.

The quality and format of all photographs should be in accordance with Clause 3.25 of the Specification.

S.1.8.20 Storm Water Management, Sediment & Erosion Control, Water Quality and Aquatic Ecology

The lands on the eastern side of Bullock Hill fall within the catchment of two EPA watercourses, the Hospital Tralee Stream (aka. The Lisloose River) and the Listellick Stream, both of which cross through the TNRR (Section B) route corridor and which are identified on Drawing No. 124042-GI-001. The Listellick Stream converges with the Hospital Tralee Stream downstream of the route corridor, and flows via the Balloonagh Culvert, through the northern part of Tralee Town converging with the Big River, and then the Lee (Tralee) River before discharging to Tralee Bay. There is also an unnamed open drain crossing through the route corridor between the two EPA watercourses which subsequently drains to the Listellick Stream just south of the route corridor. Both of the EPA watercourses are classed as having 'moderate' status under the Water Framework Directive 2019-2024 (EPA, 2024). Inland Fisheries Ireland have also advised that the Hospital Tralee Stream (aka. Lisloose River) and its tributaries, which include the Listellick Stream, are salmonid rivers, which even with culverts downstream, have the potential to hold resident brown trout. Both the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are located downstream of the Tralee TNRR (Section B) route corridor and are therefore hydraulically connected to the TNRR (Section B) corridor.

On the western side of Bullock Hill the lands fall towards Bracker O'Regan Road to the South and are drained by an un-named open drain to the south of the TNRR (Section B) corridor. This open drain subsequently drains to the culverted section of the Hospital Tralee Stream, via a branch of the Balloonagh Culvert.

On the basis of the above uncontrolled silt laden or contaminated run-off from the Ground Investigations Works discharging to the watercourses and open drains which drain the site have the potential to impact on water quality and aquatic ecology in the above referenced EPA watercourses and European sites, and the Ground Investigation Contractor will be obliged to implement appropriate robust mitigation measures to prevent such uncontrolled run-off from the Works.

S1.9 Percussion Boring (Specification Section 4) Particular restrictions / relaxations

S1.9.1 Permitted methods and restrictions (Clauses 4.1 to 4.4)

General

The scope of the Ground Investigations Contract includes percussion boring of 10 no. cable percussive boreholes (BH1001 to BH1010) at locations identified on Drawing No. 124042-GI-001 and in Table 2.4 of Schedule 2.

A hand dug inspection pit should be excavated at the location of each exploratory borehole, prior to commencing drilling as identified in S1.11.1 below and the location scanned for services using a CAT detection tool.

The methodology adopted for percussion boring shall be the 'shell and auger' or cable percussive boring technique as defined by Section 6.3 of IS EN ISO 22475-1:2006. The boring operations, sampling and in-situ testing shall comply with the recommendations of IS EN 1997-2:2007, BS 1377:1990 and IS EN ISO 22476-3:2005+A1:2011, as appropriate.

The plant used and diameter of cable percussion (shell and auger) boreholes shall be such as to ensure that the specified boring can be completed (without undue ground disturbance or ground loss), logged to the scheduled depth, sufficient representative samples can be obtained over the full depth of the borehole for subsequent laboratory testing and in-situ testing including SPT's undertaken at regular intervals.

Each borehole shall be sunk and lined with steel casing for its entire depth. Percussion exploratory holes through soil strata shall have a minimum diameter of 200mm, after which

open hole rotary drilling or hard strata rotary core drilling may follow on as specified in Schedule 2 or as instructed by the Investigation Supervisor.

Boreholes in areas of Geophysics

Any proposed boreholes in areas where geophysics has been scheduled will only commence after preliminary findings of the geophysics have been issued. Then, under instruction from the Investigation Supervisor the locations and borehole types will be decided.

Depth of boreholes

The proposed cable percussion boreholes shall be sunk to the depths specified in Table 2.3 of Schedule 2. In some instances, the boreholes may be sunk a further 1.0m if necessary to determine the depth of a particular stratum, but such depths shall not be exceeded unless instructed to do so by the Investigation Supervisor.

Hard strata (Chiselling)

Where boulders, rock and other hard strata are encountered, percussion boring using a chisel shall take place in an attempt to penetrate the obstruction and break it up sufficiently for fragments to be recovered and identified. A detailed record shall be kept of the time spent chiselling and the rate of penetration through the obstructing objects. The maximum time spent chiselling at any one obstruction shall be one hour unless expressly permitted by the Investigation Supervisor. Chiselling will only be paid when criteria as defined in Section 2.8 of the Specification are met.

Hard Strata Odex Open-Hole Drilling

All cable percussion boreholes shall be commenced in sufficient diameter so as to allow use of Odex methods where excessively coarse granular strata are encountered. It is a requirement of the contract that the minimum diameter of Odex be sufficient to allow the continuation of the borehole using Cable Tool methods utilising 150mm diameter casing.

S1.9.2 Backfilling (Clause 4.5)

Cable percussion boreholes shall be backfilled with arisings compacted in 1.0m layers as they are placed, unless otherwise directed by the Investigation Supervisor.

S1.9.3 Dynamic sampling (Clause 4.6)

(Not Required)

S1.10 Rotary drilling (Specification Section 5) Particular restrictions/relaxations

S1.10.1 Auguring requirements and restrictions (Clause 5.1)

(Not Required)

S1.10.2 Particular rotary drilling techniques (Clause 5.2)

The scope of the Ground Investigations Contract includes rotary drilling of 10 no. rotary coreholes (RC1001 to RC1010) at locations identified on Drawing No. 124042-GI-001 and in Table 2.5 of Schedule 2. These rotary coreholes are intended to facilitate the recovery of over consolidated glacial till and bedrock samples in accordance with Section 3.5 of IS EN 1997-2:2007 and IS EN ISO 22475-1, and for in-situ testing where appropriate.

The rotary coreholes will be drilled adjacent to the corresponding cable percussive boreholes. Where boreholes are independent of cable tool holes a service inspection pit 1.20 metres deep shall be excavated and a service CAT scan carried out prior to commencement of drilling.

At locations RC1001 to RC1004, open hole drilling methods (odex or symmetrix) can be utilized to advance drillholes through the initial superficial deposits (identified from adjacent percussive borehole) with rotary coring in the underlying hard fine grained or cohesive glacial deposits and bedrock. At these locations the rotary coring (of both soil and rock) shall be

undertaken using a 'triple tube' coring system, incorporating a removable inner liner. The minimum core diameter shall be 76mm (HW size) but shall be increased as necessary in order to attain the scheduled depth and optimise core recovery. All bits, core barrels, and casing shall conform to BS 4019: Part 3.

At locations RC1005 to RC1010, rotary core drilling shall be carried out using the "Geobore S Polymer Gel Coring" to facilitate the recovery of continuous core samples of both the overburden soils and underlying rock. The Geobore S Polymer Gel Coring shall be carried out in accordance with BS 5930. The Geobore S system shall be 150mm OD recovering 109mm cores. Prior to drilling, polymer gel recycling tanks shall be set up to re-circulate gel solution and minimise impact on surrounding lands. The polymer gel solution shall be biodegradable.

Cores are to be removed in 1.50 metre runs, reducing to 1.0 metres in highly weathered material. The core liner system used shall minimise the disturbance of overburden cores. The coring will terminate when the depths indicated in Schedule 2 have been reached or when instructed by the Employer's Representative. The cores are to be packed in suitable boxes and returned to the Contractors premises for logging.

The plastic liner shall be split and overburden and rock cores logged by an Experienced Geologist and detailed core logs presented. Logs are to include descriptions and the standard mechanical indices TCR, SCR and RQD. In addition a graphic fracture spacing log shall be prepared.

S1.10.3 Drilling fluid type and collection (Clause 5.3)

For the conventional rotary coring at locations RC1001 to RC1004, the drilling fluid shall normally be clean water, air or air mist. However with the agreement of the Investigation Supervisor, non toxic drilling muds, additives or foam may be used. Drilling fluid returns must be collected or appropriately controlled.

S1.10.4 Rotary core drilling equipment and core diameter (Clause 5.4.1 and 5.4.2)

As noted in S1.10.2, at locations RC1001 to RC1004, rotary coring (of both soil and rock) shall be undertaken using a 'triple tube' coring system, incorporating a removable inner liner. The minimum core diameter shall be 76mm (HW size) but shall be increased as necessary in order to attain the scheduled depth and optimise core recovery. All bits, core barrels, and casing shall conform to BS 4019: Part 3.

The Contractor should make provision for any plant and equipment he considers necessary to maximise core recovery through potentially heavily fractured or broken rock. Specifically, allowance should be made in rotary drilling rates for installation of casing support through unstable zones within the bedrock. Provision should also be made for drillhole enlargement using open holing techniques, if required.

The type and state of drill bit, feed rates and management of the drill shall be such that 100% core recovery in any single run can be obtained where the condition of the rock permits. Core recovery less than 95% in any drill run will not normally be acceptable unless the Investigation Supervisor is satisfied that a greater recovery than 95% is impractical under the prevailing conditions. Where core recovery is less than 95% or the rate of coring indicates a core recovery of less than 95%, a standard penetration test shall be carried out in the rotary core hole.

When any recovery is less than 95% from a drill run then the next drill run shall be reduced to 50% of the previous length, unless otherwise agreed by the Investigation Supervisor, and so on down to a minimum length of 0.5m. The Investigation Supervisor may specify *in situ* testing between drill runs. All cores shall be logged and photographed on site.

As noted in S1.10.2, at locations RC1005 to RC1010, rotary core drilling shall be carried out using the "Geobore S Polymer Gel Coring" to facilitate the recovery of continuous core

samples of both the overburden soils and underlying rock. The Geobore S Polymer Gel Coring shall be carried out in accordance with BS 5930. The Geobore S system shall be 150mm OD recovering 109mm cores. Prior to drilling, polymer gel recycling tanks shall be set up to re-circulate gel solution and minimise impact on surrounding lands. The polymer gel solution shall be biodegradable.

S1.10.5 Core Logging (Clause 5.4.6)

Cores shall be prepared for examination by removal of sealing materials and splitting of liners in such a way to avoid damage to the cores or cause injury to the person splitting the liners. Plastic liners shall be cut lengthwise such that at least half of the core circumference is exposed.

Prior to examination or sub-sampling of the core, the Contractor shall photograph the cores as specified in Clause 5.8. Depth shall be indicated on the core box by durable markers of a type approved by the Investigation Supervisor at one metre intervals and at all significant changes of strata and at the end of each drill run. The time between commencement of preparation and the examination of the prepared and photographed cores shall be minimised to prevent loss of moisture from core samples. Where there has been failure to achieve 100% recovery, core spacer pieces of appropriate size clearly indicating the missing lengths, shall be placed in the boxes. The location, exploratory hole number and the depth of coring relating to the contents of each box shall be clearly indicated in indelible ink on labels, inside the box, on the top and on each end of the box. All markers and labels shall be such as to facilitate subsequent photography.

Cores shall be examined, described and photographed on site by a Geotechnical Engineer or Engineering Geologist with at least 5 years of relevant experience since graduation. Logging shall be in accordance with BS5930 and contain all the additional fracture details required by the Specification

All core boxes remain the property of the Contractor.

S1.10.6 Core sub-samples for laboratory testing (Clause 5.4.7)

The Contractor shall arrange for the secure storage of all rock cores for a period of not less than 12 months beyond the date of completion of the works at an approved location.

S1.10.7 Address for delivery of selected cores (Clause 5.4.8 and 5.4.9)

(Not Required)

S1.10.8 Rotary open-hole drilling general requirements (Clause 5.5.1)

Standard penetration tests shall be undertaken in all rotary open holes at 1.5m centres up to 15m depth and at 3m centres beyond 15m depth.

S1.10.9 Rotary open-hole drilling for location mineral seams, mine workings, etc.

(Not Required)

S1.10.10 Open-hole resonance (sonic) drilling (Clause 5.6.1)

(Not Required)

S1.10.11 Resonance (Sonic) drilling with sampling or continuous coring (Clause 5.6.2)

(Not Required)

S1.10.12 Backfilling (Clause 5.7)

Rotary core boreholes shall be backfilled with cementitious grout or a cement bentonite grout mixture providing an impermeable seal above bedrock.

Backfilling of rotary core holes shall be carried out in accordance with Clause 5.7.

S1.10.13 Core Photographic Requirements (Clause 5.8)

Prior to examination or sub-sampling of the core, the Contractor shall photograph the cores as specified in Clause 5.8. Depths shall be indicated on the core box by durable markers of a type approved by the Investigation Supervisor at one metre intervals and at all significant changes of strata and at the end of each drill run.

S1.10.14 Pavement Coring

(Not Required)

S1.11 Pitting and trenching (Specification Section 6) Particular restrictions/relaxations**S1.11.1 Indirect detection of buried services and inspection pits (Clauses 3.8.3 and 6.1)**

At trial pit and slit trench locations, CAT scanning shall be carried out prior to commencement of excavation, and without personnel entry into the excavation, at frequent depth intervals during excavation until it is unsafe to do so due to the depth of the excavation.

Inspection pits in accordance with Clause 6.1 of the Specification, shall be excavated by hand to an appropriate depth at the location of all exploratory holes formed by boring, drilling, probing and penetration methods.

S1.11.2 Restrictions on plant or pitting/trenching methods (Clauses 6.2 and 6.3)

Trial pits shall be excavated by machine at the locations and to the required depth identified in Table 2.1 of Schedule 2, to enable visual examination and sampling as specified from outside of the pit.

The maximum arm reach for the excavator shall be in excess of the pit depths indicated in Schedule 2 of this Particular Specification. The base of excavated trial pits and observation pits shall not be less than 2m² in plan area.

Sufficient standing time (a minimum of 1 hour) shall be allowed from the time the pit is excavated to its specified depth to observe whether there is any change in the groundwater table or groundwater flow regime. Unless otherwise directed by the Investigation Supervisor, pits shall be opened, logged by the Contractor and backfilled on the same day.

The Contractor shall provide for the excavation of all slit trenches by hand dug methods at locations identified on Table 2.2 of Schedule 2 where utilities are likely to be encountered. Slit trenches shall be excavated to a minimum depth of 1.5m, unless otherwise directed by the Investigation Supervisor, and shall be of a sufficient size such that all services encountered can be accurately recorded and photographed.

The Contractor shall apply to the Roads Authority for licenses to open the road to carry out slit trenching. The Contractor shall submit a copy of the licenses to the Investigation Supervisor before commencing the slit trenching.

Should any concrete or bituminous paving be encountered, before excavation the edges of slit trenches must be saw-cut to minimise overbreak. The Contractor should allow in his rates for logging of strata, recording depth and nature of all services and levelling to Malin Head Datum of all the trenches and services encountered.

All excavated material from slit trenches on roads and pavements shall not be used for re-statement and the Contractor should make provision for the disposal of the surplus material off site.

S1.11.3 Entry of personnel (Clause 6.5)

(Not Required)

S1.11.4 Alternative pit and trench dimensions (Clause 6.7)

(Not Required)

S1.11.5 Abstracted groundwater from land affected by contaminations (Clause 6.9.2)

(Not Required)

S1.11.6 Backfilling (Clause 6.10)

Backfilling of the pits and trenches shall be carried out as soon as practicable with material replaced at a similar depth as encountered. Any material used to backfill the excavations shall be either; the excavated material or a suitable equivalent based on assessment and subsequent approval by the Investigation Supervisor. Backfill and material and compaction level must be approved by the investigation supervisor prior to reinstatement.

Permanent immediate reinstatements of slit trenches are to be undertaken in accordance with the requirements of the TII '**Specification for the Reinstatement of Openings in National Roads**'.

S1.11.7 Photographic requirements (Clause 6.12)

A minimum of three photographs shall be taken at each trial pit and slit trench location using a digital camera, of which at least two shall be of the pit sides and at least one of stockpiled materials. A scale and board identifying the individual pit shall be included within all photographs.

S1.11.8 Artificial lighting (Clause 6.12.2)

(Not Required)

S1.11.9 Provision of pitting equipment and crew for Investigation Supervisor's use (Clause 6.13)

(Not Required)

**S1.12 Sampling and monitoring during intrusive investigation (Specification Section 7)
Particular restrictions/relaxations****S1.12.1 Address for delivery of selected geotechnical samples (Clause 7.6.1)**

N/A – Geotechnical samples to be disposed of 12 months after issue of final reporting.

S1.12.2 Retention and disposal of geotechnical samples (Clause 7.6.2)

(Not Required)

S1.12.3 Frequency of sampling for geotechnical purposes (Clause 7.6.3 – 7.6.11)**Frequency of sampling in boreholes:**

The Contractor shall take samples as follows from borings:

- a. Small disturbed samples:
 - at each change in soil type or consistency
 - at intervals in any cohesive stratum midway between successive tests or undisturbed samples
 - with each bulk disturbed sample in cohesive soil
 - cutting shoe samples
 - split spoon samples (where appropriate)
- b. Bulk disturbed samples:
 - over the zone of each penetration resistance test
 - in granular materials between successive penetration resistance tests
 - from the point at which variable head permeability tests were carried out
 - in cohesive materials in areas of proposed cuttings

- c. Undisturbed samples:
- at every change immediately following the taking of the small disturbed samples and at a maximum of 1.0 metres centres for the first 10 metres and at 1.5 metre intervals thereafter between successive undisturbed samples or bulk disturbed samples, or in-situ tests, in cohesive materials except structural holes in cutting where 1 metres intervals shall continue for 5 metres below formation.
 - in structural holes alternating with standard penetration tests at 1 metre intervals.
 - set of three undisturbed U38mm samples or U100 shall be taken in cohesive soils where possible
 - Undisturbed Block samples shall be cut by hand from cohesive soils where indicated in the testing schedule and agreed with the Investigation Supervisor on site.
 - Russian Peat Sampler Continuous sampling in peat/soft soils shall be obtained to refused depth of probe. Samples to be wrapped in polythene and returned to laboratory for classification by Von Post system and logging. Selected sections may be tested for natural moisture (organic and Atterberg limits, etc).
 - At locations where there is soft ground with SPT 'N' values of 10 or less, below topsoil level or as indicated by the Investigation Supervisor.
- d. Piston Samples: *(Not Required)*

Frequency of sampling in Inspection and Trial Pits

- a. Small disturbed samples:
- at each change in soil type or consistency
 - at intervals midway between successive tests or bulk samples
 - at each bulk sample in cohesive soils
 - at 0.25 metres centres in selected pits for moisture profile
- b. Bulk disturbed samples
- at locations immediately following each change in soil type or consistency and at 1 metres intervals
 - (large bulk samples) where earthworks testing may be required, e.g. shear box testing.

S1.12.4 Open-tube and piston sample diameter (Clause 7.6.5)

(Not Required)

S1.12.5 Retention of cutting shoe samples (Clause 7.6.5)

(Not Required)

S.1.12.6 Thin walled sampling (Clause 7.6.12)

(Not Required)

S1.12.7 Groundwater level measurements during exploratory hole construction (Clause 7.7)

Where ground water is encountered in exploratory holes, the measurements detailed in Clauses 7.7.1 to 7.7.3 of the Specification shall be recorded.

Where artesian conditions are encountered, the Contractor shall inform the Investigation Supervisor and consult and agree with him the measures to be taken in accordance with Specification Clause 4.4.

S1.12.8 Special geotechnical sampling (Clause 7.8)*(Not Required)***S1.12.9 Address for delivery of selected samples (Clause 7.9.2)**

N/A – Selected samples to be disposed of 12 months after issue of final reporting.

S1.12.10 Retention and Disposal of contamination (WAC) Samples (Clause 7.9.3)*(Not Required)***S1.12.11 Frequency of sampling (Clause 7.9.4)***(Not Required)***S1.12.12 Sampling method (Clause 7.9.5)***(Not Required)***S1.12.13 Headspace testing (Clause 7.9.8)***(Not required)***S1.13 Probing and cone penetration testing (Specification Section 8) Particular restrictions/relaxations****S1.13.1 Type(s) and reporting of dynamic probing (Clauses 8.1.1 and 8.1.2)**

Dynamic Probes are to be undertaken at the locations identified and to the depths specified in Table 2.3 of Schedule 2 in accordance with IS EN ISO 22476-2. The probing is to be carried out using heavy dynamic probing (DPH) using a 50kg hammer.

S1.13.2 Capacity and equipment requirements for cone penetration testing (Clause 8.2.1)*(Not required)***S1.13.3 Reporting of cone penetration testing parameters (Clause 8.2.4)***(Not Required)***S1.13.4 Seismic cone equipment requirements (Clause 8.3.1)***(Not Required)***S1.13.5 Interpretation of seismic cone tests (Clause 8.3.4)***(Not Required)***S1.13.6 Other cone or specialist probes (Clause 8.4)***(Not Required)***S1.14 Geophysical Survey Requirements (Specification Section 9) Particular restrictions/relaxations**

Geophysical surveys shall include a Ground Penetrating Radar Survey (GPR) utility survey conducted in accordance with PAS 128:2014 at the locations identified in Table 2.6 of Schedule 2 and on Drawing No. 124042-GI-001.

S1.14.1 Geophysical Survey Objectives (Clause 9.1.1)

The geophysical survey is primarily to investigate and provide information as follows:

An underground utility survey shall be carried out for the areas indicated GPR 1001 (Bracker O'Regan Road) and GPR 1002 (Bullock Hill) on the Contract Drawing 124042-GI-001. The survey is designed to provide a comprehensive and accurate set of record drawings detailing all sub-surface services, their underground routes as well as any surface features identifying

the presence of these underground utilities. These records are to be compiled and delivered in both hard-copy and digital AutoCAD format drawings.

The requirements of this survey are to:

- Locate, record, map and label the location and extent of existing underground manholes, chambers and tanks;
- Locate, record, map and label the exact location, type, size and depth of existing underground utilities within the confines of the survey areas.

S1.14.2 Requirement for competent geophysicist (Clause 9.1.1)

The survey shall be carried out under the direction of a qualified and professionally registered Geophysicist and experienced field personnel. The survey director will have a minimum of a B.Sc in Applied Geophysics together with at least five year's experience of supervising engineering geophysical surveys, and be professionally registered (P. Geo or C. Geol.). Field staff responsible for carrying out the geophysical survey on site will have a minimum of three year's experience of engineering geophysical surveys.

CVs of key personnel shall be submitted as part of the tender. A list of previous similar projects, tender cost, outturn cost, and reference contact shall be submitted with the tender if requested in the Instructions to Tenderers.

Quality Control

Details of the Contractor's quality control, equipment calibration and data recording procedures shall be submitted with the tender documents. Provision should be made in the tender price for QC repeat readings of up to 5% of the field data.

S1.14.3 Trial Geophysical methods required (Clause 9.1.1)

(Not Required)

S1.14.4 Types of geophysical methods required (Clause 9.1.1)

The survey shall be a Type B (detection) survey as described in Table 2 in PAS 128:2014. The detection method shall be M2P. Survey type D is a prerequisite for survey type B and survey type D shall be carried out in accordance with PAS 128:2014 Section 6. The identification of utility owners and the request for asset information should be extended into areas adjacent to the survey area, as this might offer an informative understanding of where utility feeds derive.

Underground services shall be located continuously and recorded in three dimensions. Where bands of cables/ducts are identified, the upper and lower outer cables / ducts will be traced in order to be able to provide a cross section of the cable / duct band. The following services are known to exist and shall be surveyed ;

- Surface Water Drainage
- Foul Water Drainage
- Watermains
- Telecommunications (Eir, SIRO)
- Electricity
- Street Lighting
- Traffic Signals

Final survey information is to comprise a report inclusive of 3D drawings of underground services in the subject area with each service duct represented by a line representing the centreline of the crown of the service / duct. This file will be created in Civil 3D and referenced to the IGN and Malin Head. Each utility should have a layer named in accordance with the detected service.

Surface Water Drainage:

- All drains and drain connections with invert levels.
- All manholes which are within the survey area.
- Material and diameter of pipework.
- Connections to storm/foul and combined water sewers.
- Depth below ground shall be annotated at each surface feature and at significant changes of depth.
- Manholes, catch pits, inspection chambers and headwalls.
- Connections to buildings.

Foul Sewage:

- All sewers and sewer connections.
- Material and diameter of pipework.
- Connections to foul/storm and combined water sewers.
- Depth below ground shall be annotated at each surface feature and at significant changes of depth.
- Manholes, catch pits, inspection chambers and headwalls.
- Connections to buildings.
- Depths below ground shall be annotated at each surface feature and at significant changes of depth.

Telecommunications:

- Cable routes with levels, numbers and sizes of ducts.
- Cable draw pits and manholes.
- Owner/operator.
- Connections to buildings.
- Depth below ground shall be annotated at each surface feature and at significant changes of depth.
- Number and configuration of cables/ducts.
- Fibre Optic routes and levels.

Electricity:

- Cable routes and levels.
- Cable draw pits and manholes including those associated with traffic.
- Voltages classified as: Low (0-11kv), High (over 11kv-66kv) and Transmission (66kv or over). If applicable.

- Connections to buildings.
- Depth below ground shall be annotated at each surface feature and at significant changes of depth.
- Location of overhead electricity lines shall be verified on site.

Watermains:

- Pipe routes with levels;
- Valve and meter pits:
- Diameters, material specifications and working pressures;
- Depth below ground shall be annotated at each surfaced feature and at significant changes of depth.

Gas:

- Pipe routes with levels;
- Valve and meter pits:
- Diameters, material specifications and working pressures;
- Depth below ground shall be annotated at each surfaced feature and at significant changes of depth.

Street Lighting

- Public lighting routes & associated chambers.
- Depth below ground shall be annotated at each surfaced feature and at significant changes of depth.

Traffic Signals:

- Traffic signal duct routes & associated chambers.
- Depth below ground shall be annotated at each surfaced feature and at significant changes

Other Services:

- Other services including abandoned services which are located during the survey shall be recorded with any available information regarding the identity or type of materials or services.
- Depth below ground shall be annotated at each surfaced feature and at significant changes of depth.

Other Underground Buried Features:

- Other underground features including foundations, tanks, conduits, abandoned services and services undetected using radio detection etc. shall be recorded using ground penetrating radar methods.

Manhole/Service Chamber Survey Requirements (excluding drainage manholes):

- A detailed survey of each utility manhole/service chamber encountered, including chamber type and record of incoming pipes/ducts showing depth, material and diameter.

S1.14.5 Information Provided (Clause 9.2)

A copy of the topographical survey of the site is included with the Tender documentation

S1.14.6 Horizontal data density (Clause 9.3)

(Not Required)

S1.14.7 Level datum (Clause 9.4)

All locations will be set out and surveyed to ITM using DGPS or total station. The level of accuracy required for the surveying of the resistivity and seismic refraction profiles is +/- 1m on the Plan Location and +/- 0.1m of the Ground Elevation.

S1.14.8 Geophysical survey report (Clause 9.7)

A draft Geophysical Report should be submitted to the Investigation Supervisor or his site representative a maximum of one week after completion of field works.

S1.15 Particular in-situ Testing (Specification Section 10) Particular restrictions/relaxations**S1.15.1 Tests in accordance with Irish, UK or European Standards (Clause 10.3)**

The following in situ tests shall be carried out and reported in accordance with BS 1377/IS EN 22476-3, as appropriate:

- **Standard Penetration Test (SPT) (to IS EN ISO 22476-3):**

In general, the Standard Penetration Test, when carried out in clays, silts and sands is to be performed with a split barrel sampler (SPT) and in gravels and weak rock by plugging the standard tube with a cone end (SPT(C)).

In certain soil types, (i.e. granular material) it may be necessary to carry out the penetration test with the borehole filled with water to ground level to overcome the head of water causing "blowing" of the granular soil.

Standard penetration resistance tests shall be carried out in boreholes as follows:

- at every change and at 1.0m centres for the first 10m and at 1.5m intervals thereafter in granular soils
- after failure of undisturbed sampling in boulder clay
- through the base of undisturbed samples in cohesive soils
- in structural holes alternating with driven undisturbed samples at 1m intervals

- **California Bearing Ratio (CBR) (to BS 1377):**

CBR tests shall be undertaken in Trial Pits at the locations and levels specified in Table 2.1 of Schedule 2, or such other level instructed or agreed by the Investigation Supervisor. Where possible an in-situ CBR test shall be carried out otherwise a CBR mould sample shall be taken. At all locations where in situ CBR tests are carried out or CBR moulds are taken to the laboratory for testing, in-situ density tests shall be performed. Various methods may be employed in agreement with or as instructed by the Investigation Supervisor.

S1.15.2 Hand penetrometer and hand vane for shear strength (Clause 10.4.1)**Hand Shear Vane Tests**

Hand shear vane tests shall be undertaken at 0.5m depth and at 1.0m-1.2m depth where predominantly cohesive soil is encountered in trial pit excavations. Hand shear vane tests shall be undertaken by a qualified and experienced Geologist / Geotechnical Engineer / Engineering Geologist. The results of the test (peak and residual undrained shear strength, together with the dimensions of the vane cruciform used) shall be reported on the relevant trial pit log. Copies of current calibration certification shall be forwarded to the Investigation Supervisor.

Field In Situ Vane Test

Field in situ vane testing shall be performed at 1m depth intervals in peat/soft clay deposits, using Geonor (H10) penetration vane. Results (peak and residual undrained shear strength) shall be reported in the relevant borehole log. Copies of current calibration certification shall be forwarded to the Investigation Supervisor.

S1.15.3 Self-boring pressuremeter and high-pressure dilatometer testing and reporting (Clause 10.5.1)

(Not Required)

S1.15.4 Driven or push-in pressuremeter testing and reporting requirements (Clause 10.5.2)

(Not Required)

S1.15.5 Menard pressuremeter tests (Clause 10.5.3)

(Not Required)

S1.15.6 Soil infiltration test (Clause 10.6)

Soil Infiltration Tests in accordance with BRE Digest 365 shall be performed at six locations to be instructed by the Investigation Supervisor.

S1.15.7 Special in situ testing and reporting requirements (Clause 10.7)

(Not Required)

S1.15.8 Interface probes (Clause 10.8)

(Not Used)

S1.15.9 Contamination screening tests (Clause 10.9)

(Not Required)

S1.15.10 Metal detection (Clause 10.10)

(Not Required)

S1.16 Instrumentation Requirements (Specification Section 11) Particular restrictions/relaxations**S1.16.1 Protective covers for installations (Clause 11.2)**

(Not Required)

S1.16.2 Protective fencing (Clause 11.3)

Appropriate stock proof fencing shall be supplied and erected by the Contractor at the location of each standpipe/standpipe piezometer location identified in Schedule 2.

S1.16.3 Standpipe and standpipe piezometer installations (Clauses 11.4.1 and 11.4.2)

Standpipes or Standpipe Piezometers shall be installed at the completion of rotary core boreholes as indicated in Schedule 2 or as directed by the Investigation Supervisor. Standpipes and Piezometers shall be 50mm diameter with locking cap and minimum 0.5m screened interval located in permeable soil or rock stratum. The Contractor shall contact the Investigation Supervisor who will advise the exact length and target depth for each screened interval.

Response zones may be required over specific depths depending on the conditions encountered during drilling. The Contractor shall contact the Investigation Supervisor for such details where appropriate and in good time so as to avoid or minimise standing time. The preparation of draft logs for boreholes with piezometer installations shall be prioritised.

Where a requirement for response zones over specific depths have been identified, a multilevel Piezometer arrangement shall be installed at the completion of the relevant rotary core borehole as directed by the Investigation Supervisor. This arrangement shall include multiple 50mm Piezometers installed in the same borehole with screened intervals or response zones at varying depths. The interval between varying response zones for each Piezometer shall be sealed using bentonite to a minimum depth of 1m to ensure discrete groundwater sampling and level readings at varying depths into the aquifer. The Investigation Supervisor shall provide a detailed installation arrangement for the multilevel Piezometer arrangement prior to the completion of the installation. The Contractor shall contact the Investigation Supervisor for installation details where appropriate and in good time so as to avoid or minimise standing time.

S1.16.4 Other piezometer installations (Clause 11.4.3)

(Not Required)

S1.16.5 Development of standpipes and standpipe piezometers (Clause 11.4.5)

(Not Required)

S1.16.6 Ground gas standpipes (Clause 11.5)

(Not Required)

S1.16.7 Inclinator installations (Clause 11.6)

(Not Required)

S1.16.8 Slip indicators (Clause 11.7)

(Not Required)

S1.16.9 Extensometers and settlement gauges (Clause 11.7)

(Not Required)

S1.16.10 Settlement monuments (Clause 11.9)

(Not Required)

S1.16.11 Removal of installations (Clause 11.10)

(Not Required)

S1.16.12 Other instrumentation (Clause 11.11)

(Not Required)

S1.17 Installation monitoring and sampling of groundwater instrumentation (Specification Section 12) Particular restrictions/relaxation

S1.17.1 Groundwater level readings in installations (Clause 12.2)

All Standpipes or Standpipe Piezometers installed by Contractor shall have water levels readings recorded by the Contractor once a week until completion of the Project. Such readings shall be reported to the Investigation Supervisor on a weekly basis.

S1.17.2 Groundwater sampling from installations (Clause 12.3.1)

(Not Required)

S1.17.3 Purging/micro-purging (Clause 12.3.2)

Groundwater samples shall be obtained utilising a sterilised pump with purging of three times the borehole volume taking place prior to the sample being taken.

S1.17.4 Ground gas monitoring (Clause 12.4)

(Not Required)

S1.17.5 Sampling from ground gas installations (Clause 12.5)*(Not Required)***S1.17.6 Other monitoring (Clause 12.8)***(Not Required)***S1.17.7 Sampling and testing of surface water bodies (Clause 12.9)***(Not Required)***S1.18 Particular Daily Report Requirements (Specification Section 13) Particular restrictions/relaxation****S1.18.1 Information for daily records (Clause 13.1)**

Daily Reports of completed works and all associated field logs are to be provided to the Investigation Supervisor's site representative at the end of each working day.

S1.18.2 Special in situ tests and instrumentation records (Clause 13.4)*(Not Required)***S1.19 Geotechnical laboratory testing (Specification Section 14) Particular restrictions/relaxation****S1.19.1 Investigation Supervisor or Contractor to schedule testing (Clause 14.1.1)**

Preliminary geotechnical logs shall be provided by the Contractor within seven days of completion of fieldwork at a given exploratory location, together with a detailed sample list on an agreed pro-forma laboratory testing sheet. The Investigation Supervisor or his site representative shall schedule all laboratory tests.

S1.19.2 Tests required (Clause 14.1.2)

It must be accepted that geotechnical laboratory testing quantities cannot be accurately predicted at tender stage pending confirmation of detailed ground conditions identified during the site geotechnical investigations. On this basis the scope and quantities of laboratory testing identified below and included in the Bill of Quantities in Annex 1 may change once the results of the site geotechnical investigations have been confirmed.

The scope of geotechnical testing of soils scheduled by the Investigation Supervisor is likely to include:

- Natural Moisture Content
- Attenburg Limits (Liquid Limit (LL), Plastic Limit (PL) and Plasticity Index (PI))
- Particle Size distribution (PSD)
- Moisture Condition Value (MCV)
- California Bearing Ratio (CBR)
- Unconfined Compressive Strength
- Dry Density/Moisture Content Relationship
- Shear Strength/Moisture Content Relationship

For each determination of dry density/moisture content relationship ('Proctor Compaction test' – Test 3, Part 5, BS1377 (1990)), three hand vane tests shall be undertaken on samples prepared at different moisture contents in order to determine shear strength/moisture content relationship.

The results of soil relationship tests on each bulk sample shall be presented in tabulated data format. Variations in MCV, CBR, dry density and hand vane shear strength as a function of moisture content shall be plotted on an individual sheet pertaining to each bulk sample tested. The format of these composite plots shall be agreed with the Investigation Supervisor prior to submission of the Draft Factual Report.

The scope of chemical testing scheduled by the Investigation Supervisor is likely to include:

- Organic matter content
- Acid soluble sulphate content
- Water soluble sulphate content
- Total sulphur content

The scope of rock testing scheduled by the Investigation Supervisor is likely to include:

- Point Load Strength Index (PLSI)
- Uniaxial Compressive Strength (UCS)
- Flakiness Index
- Slake Durability
- Water Absorption
- Los Angeles Abrasion
- Magnesium Sulphate Soundness

Rock testing shall be carried out in accordance with Clause 14.5.

S1.19.3 Specifications for tests not covered by BS 1377 and options under BS 1377 (Clause 14.2.1 and 14.4)

(Not Required)

S1.19.4 INAB or UKAS accreditation to be adopted (Clause 14.3)

All samples to be completed by laboratories with either INAB ISO/IEC 17025 or UKAS ISO/IEC 17025 accreditation. Laboratories are also to be certified to ISO 9001, 14001 and 45001.

S1.19.5 Rock testing requirements (Clause 14.5)

(Not Required)

S1.19.6 Chemical testing for aggressive ground/groundwater for concrete (Clause 14.6)

Chemical Testing on potentially aggressive ground or groundwater shall be performed in accordance with BRE Special Digest SD1 Suite B for a Greenfield site with pyrite present.

S1.19.7 Laboratory testing on site (Clause 14.7)

(Not Required)

S1.19.8 Special laboratory testing (Clause 14.8)

(Not Required)

S1.20 Geoenvironmental laboratory testing (Specification Section 15) Particular restrictions/relaxation

(Not Required)

S1.20.1 Investigation Supervisor or Contractor to schedule testing (Clause 15.1)

(Not Required)

S1.20.2 Accreditation required (Clause 15.2)

Chemical laboratory testing should be carried out to International Standard IS EN ISO/IEC 17025. It is recommended that laboratory testing should be undertaken by accredited laboratories (INAB or UKAS)

S1.20.4 Waste Characterisation (Clause 15.4)

(Not Required)

S1.20.5 Waste Acceptance Criteria (Clause 15.5) (Test Suites H and I)

Testing shall be performed in accordance with Suite H – Inert Waste Landfill WAC.

S1.20.6 Laboratory Testing (Clause 15.6)

(Not Required)

S1.20.7 Special Laboratory Testing (Clause 15.7)

(Not Required).

S1.21 Reporting (Specification Section 16) Particular restrictions/relaxation**S1.21.1 Form of exploratory hole logs (Clauses 16.1 and 16.2.1)**

The Contractor shall prepare a preliminary log of each exploratory hole and presented to a suitable vertical scale. Any water strikes shall be represented graphically in a separate column on logs. This log in draft format will be required for the Investigation Supervisors inspection 48 hours after the completion of the exploratory hole for comment.

For Trial Pits and slit trenches, a simplified version of a log shall be provided detailing the dimensions, strata encountered, sketch of the depth to and the nature of any services encountered together with observations on any groundwater encountered. Elevations showing each face of the pit shall be provided where variations in strata exist. All records are to be prepared on site and reviewed by an appointed Check Engineer.

Final Logs

The exploratory hole logs shall be in the same form as the preliminary logs, and shall include all the information required for Preliminary logs, such information having been updated as necessary in the light of laboratory testing, further examination of samples and cores and re-evaluation of the systematic description or categorisation of the strata.

S1.21.2 Information on exploratory hole logs (Clause 16.2.2)

(Not Required)

S1.21.3 Variations to final digital data supply requirements (Clause 16.5.1)

The Contractor shall provide exploratory hole, in situ test, groundwater monitoring and laboratory test data in AGS digital form as ASCII format on USB flash drive or other transmission media as agreed by the Investigation Supervisor. The files shall not be compressed. The digital data files shall comply with the Rules of the Association of Geotechnical Data from Ground Investigations (3rd Edition, 1999).

Within 7 days after the Investigation Supervisor gives permission to start the Investigation the Contractor shall submit to the Investigation Supervisor a dummy set of data on disk in the required format.

AGS v3.1 data for preliminary hole records and laboratory testing shall be issued with the preliminary logs and laboratory test results, respectively on a weekly basis.

At the end of Site Operations the Contractor shall issue to the Investigation Supervisor a set of digital data disks containing Preliminary Hole Records and in situ test records, fully checked and edited, and incorporating Investigation Supervisors amendments if instructed. On submission of the final Factual Report, the Contractor shall issue to the Investigation Supervisor a full set of digital data disks clearly marked "Final". The number of sets issued will be equal to the number of factual reports requested.

All disks or other agreed transmission media shall be securely labelled and clearly marked. The Contractor shall keep, until 12 months after the Investigation is complete and clause 4.4 of the Conditions of Contract is complied with, an identical copy of each disk issued and a comprehensive index of the disks issued.

For each data file, the index shall detail:

- a) The file name, including the extension '.AGS'
- b) The date and time the file was created;
- c) A general description of the data contained in each file.

The Contractor is to pay particular attention to ensure consistent and accurate sample / specimen referencing throughout all AGS data, particularly where more than one laboratory is being used.

In addition to paper copies, all drawings contained in the Final factual report shall be submitted on CD in AutoCAD format.

S1.21.4 Preliminary digital data (Clause 16.5.3)

(Not Required)

S1.21.5 Type(s) of reports required (Clause 16.6)

The Contractor shall schedule and resource their works to ensure the following deadlines:

- **Draft Report** – up to date drafts to be supplied digitally on a weekly basis as work progresses, and
- **Main Factual Report** – Shall to be supplied no later than **four weeks** after the completion of the Site Operations.

S1.21.6 Electronic report requirements (Clause 16.6.3)

(Not Required)

S1.21.7 Format and contents of Desk Study Report (Clause 16.7)

(Not Required)

S1.21.8 Contents of Ground Investigation Report (or specified part thereof) (Clause 16.8)

On completion of the works the Contractor shall submit his final Report **within 4 weeks** of the final exploratory hole. The Report shall comprise the Factual Report incorporating the Digital Data subdivided in an agreed way with the Investigation Supervisor.

The Report shall be bound into loose leafed hard backed multiple ring binders with not more than 50mm thickness of content in each, or as otherwise directed by the Investigation Supervisor. Each volume of the Report shall begin with a cover page showing the name of the Contract, Date and the names of the Employer, Investigation Supervisor and Contractor. Contents pages shall cover the Report as a whole, and also the specific volume contents. Report pages shall be numbered consecutively.

The general format, arrangement and content shall be agreed with the Investigation Supervisor at the earliest opportunity in the Contract and updated in consultation thereafter.

The Factual Report shall contain the following information where applicable:

- (a) A brief factual description of the Investigation, stating the aim of the Investigation, the numbers and types of exploratory holes, time of year and weather conditions encountered a brief description of the Site Operations, list of laboratory tests and a summary of general geology and revealed strata. Summaries of exploratory holes undertaken with co-ordinates and ground levels, lists of in situ test locations and types.
- (b) Exploratory hole records, all in numerical order and separately grouped if required, all reported in accordance with BS5930:1999 and BS1377:1990

- (c) All in -situ test records and results.
- (d) All laboratory test records and results, including all information described in BS1377: Part 1, Clause 9.1.
- (e) Summary sheets of all test results.
- (f) Site plans showing locations of all exploratory holes and areas covered by the Investigation, including the Scale and North sign, key plan of drawings.
- (g) Longitudinal Sections showing existing ground level. The exploratory holes shall be identified and the revealed strata marked on the Section at the appropriate location and at the same vertical scale. In situ test results (N values) and Point Load Index Results and water levels shall be shown. The scale shall be suitable for reading the data. Cross Sections showing similar details shall be provided if required by the information or requested by the Investigation Supervisor.
- (h) Photographs of trial pits and rotary cores (soil and rock) as duplicate colour photographic prints of 175mm x 125mm size and as digital images on a memory stick.
- (i) All investigations shall have co-ordinates to Irish Transverse Mercator (ITM) and reduced levels to Malin Head Datum.
- (j) Photographic record.

All exploratory holes shall be incorporated. Records shall be of the form utilised for preliminary records. The records shall include all the information set out in the Specification, such information having been updated as necessary in the light of laboratory testing. Laboratory and in situ test results shall be recorded in the exploratory hole records and/or presented in tabular or graphical form as required.

The Contractor shall be required to provide digital laboratory schedules to the Investigation Supervisor for scheduling of sample testing by the Investigation Supervisor. The Contractor shall be required to provide in digital format (AGS) draft results of lab tests on a weekly basis. Summaries of laboratory tests shall be presented in tabular form as numerical borehole order and/or soil types, aggregation for statistical purposes.

Digital data shall be produced in accordance with the Specification. On request the Investigation Supervisor will provide suitable originals of the site plans, longitudinal Section and other sections for the plotting of exploratory holes.

All Reports shall be submitted to the Investigation Supervisor for review and comment. Comments shall be incorporated by the Contractor and re-issues provided as necessary within 1 week of receipt of these comments. Each Report shall be a fully checked and edited version, have passed through a documented procedure for approval and signed by a designated representative of appropriate experience and seniority. The final report shall include all relevant information recorded in journals and preliminary records as specified.

S1.21.9 Contents of Geotechnical Interpretative or Design Report (or specified part thereof) (Clauses 16.9 and 16.10)

Drawings are included in the Information Pack, which in conjunction with the results of the ground investigations, including associated in-situ and laboratory testing, are intended to facilitate the appointed Contractor in providing appropriate geotechnical interpretation and advice in relation to the follow geotechnical aspects of the engineering design of the Roadworks for Tralee Northern Relief Road (Section B):

- Rock and Subsoil Reusability – Drawing Nos. 124042-GI-101 (Mainline Longitudinal Section) and 124042-GI-102 (Mainline Typical Sections) indicate the extent of cut and fill operations likely to be required along the length of Tralee Northern Relief Road (Section B). On the basis of analysis of results of in-situ and laboratory testing of samples of rock and over consolidated glacial fills recovered during the ground investigations, the Ground Investigation Contractor shall advise on their suitability for re-use in the context of compliance with the appropriate TII Specifications and Standards.

- Rock Excavatability - Drawing Nos. 124042-GI-101 (Mainline Longitudinal Section) and 124042-GI-102 (Mainline Typical Sections) indicate the extent of cut likely to be required along the length of Tralee Northern Relief Road (Section B). On the basis of analysis of results of in-situ and laboratory testing of samples of rock recovered during the ground investigations, the Ground Investigation Contractor shall advise on the excavatability of the rock likely to be encountered and the most appropriate methodologies likely to be required to facilitate same.
- Groundwater/Infiltration – Drawing Nos. 124042-GI-101 (Mainline Longitudinal Section) and 124042-GI-102 (Mainline Typical Sections) indicate the extent of cut and fill operations likely to be required along the length of Tralee Northern Relief Road (Section B). On the basis of analysis of results of groundwater observations during the exploratory investigations and groundwater monitoring of standpipes/piezometers, the Ground Investigation Contractor shall advise potential groundwater implications for the proposed earthworks.

On the basis of the results of the Soil Infiltration Tests in accordance with BRE Digest 365 at locations to be instructed by the Investigation Supervisor, the Ground Investigation Contractor shall advise on the potential suitability of the subsoils encountered for the discharge of surface water by infiltration.

- Slopes/Batters – advice as to the maximum temporary and long term slope angles that should be adopted for batters constructed in both upper subsoil layers and the underlying rock, as appropriate as well as for embankments constructed in materials recovered from the Works.
- Interpretation of ground conditions, bearing capacities and appropriate foundation solutions to be adopted for the three watercourse crossings identified on Drawing Nos. 124042-GI-500 to 503.

S1.21.10 Times to supply of electronic information (Clause 16.11.1)

(Not Required)

S1.21.11 Electronic information transmission media (Clause 16.11.2)

(Not Required)

S1.21.12 Report approval (Clause 16.12)

The Contractor shall allow one week in his programme of investigation for the Investigation Supervisor to grant approval of the Draft Factual Report and he shall include amendments, if any, as required by the Investigation Supervisor, in the Final Report.

S1.21.13 In Situ Test Results

Other than for tests normally reported on the daily driller's report the Contractor shall submit records of the other in situ tests within 48 hours of the completion of the date on which the test was completed for comment. The information shall be supplied in a format required by the BS covering the test or other standard applying and/or agreed by the Investigation Supervisor. All calculations of derived parameters shall be undertaken and any assumptions stated. The results shall have been reviewed before submission by a Check Engineer within seven days.

At the end of site operations, all individual result sheets shall have been submitted together, revised in the light of other information, together with a sequential tabulation indicating the hole number, test depths, soil type, results summary and remarks on the suitability of each test.

Schedule 2: Exploratory Holes and Testing for Contract

Tralee Northern Relief Road – Section B GI:

(Schedule of Investigations – see Contract Drawings for locations)

TP = Trial Pit; ST = Slit Trench; CP = Cable Percussion; RO = Rotary Open Hole; RC = Rotary Coring with core recovery; PG = Polymer Gel Geobor S rotary coring with plastic liner continuous sampling.

Table 2.1 Trial Pit Schedule

Trial Pits								
TP No.	Type	Schedule Depth (m)	Remarks	Co-ordinates		Chainage	Proposed EL	Existing EL
				Easting	Northing			
TP1001	TP	2.5	CBR test at formation level	484383	616879	~1207m	-	67.73
TP1002	TP	2.5	CBR test at formation level	484380	616839	~1200m	-	66.98
TP1003	TP	2.5	CBR test at formation level	484285	616880	~1105m	-	60.95
TP1004	TP	2.5	CBR test at formation level	484254	616849	~1078m	-	61.33
TP1005	TP	2.5	CBR test at formation level	484198	616849	~1021m	-	58.77
TP1006	TP	2.5	CBR test at formation level	484138	616862	~961m	-	59.65
TP1007	TP	2.5	CBR test at formation level	484005	616902	~829m	-	57.50
TP1008	TP	2.5	CBR test at formation level	48939	616838	~753m	-	60.50
TP1009	TP	2.5	CBR test at formation level	483871	616875	~695m	-	66.50
TP1010	TP	2.5	CBR test at formation level	483835	616908	~668m	-	69.42
TP1011	TP	2.5	CBR test at formation level	483426	616445	~25m	-	33.24
TP1012	TP	2.5	CBR test at formation level	483355	616445	~25m	-	32.30

Table 2.2 – Slit Trench Schedule

Slit Trenches					
ST No.	Type	Schedule Depth (m)	Remarks	Co-ordinates	
				Easting	Northing
ST-1001	ST	1.5	Inspect Utilities/Services Overall length 8m	483847	616846
ST-1002	ST	1.5	Inspect Utilities/Services in verge. Overall length 14m	483381	616426
ST-1003	ST	1.5	Inspect Utilities/Services in verge Overall length 10m	483381	616416

Table 2.3 – Dynamic Probe Schedule

Dynamic Probes								
ST No.	Type	Schedule Depth (m)	Remarks	Co-ordinates		Chainage	Proposed EL	Existing EL
				Easting	Northing			
DP1001	DP	5m or Refusal	Refusal is N>10	484406	616862	1229m	70.650	68.592
DP1002	DP	5m or Refusal	Refusal is N>10	484336	616858	1158m	67.245	65.258
DP1003	DP	5m or Refusal	Refusal is N>10	484253	616865	1075m	63.375	60.172
DP1004	DP	5m or Refusal	Refusal is N>10	484179	616873	1000m	61.840	60.317
DP1005	DP	5m or Refusal	Refusal is N>10	483992	616875	813m	61.254	58.499
DP1006	DP	5m or Refusal	Refusal is N>10	483942	616865	762m	62.678	60.718
DP1007	DP	5m or Refusal	Refusal is N>10	483887	616892	N/A	65.263	66.191
DP1008	DP	5m or Refusal	Refusal is N>10	483861	616907	N/A	66.763	68.341
DP1009	DP	5m or Refusal	Refusal is N>10	483817	616931	N/A	69.263	70.574
DP1010	DP	5m or Refusal	Refusal is N>10	483782	616950	N/A	71.263	72.252
DP1011	DP	8m or Refusal	Refusal is N>10	483765	616821	580m	64.510	69.013
DP1012	DP	10m or Refusal	Refusal is N>10	483654	616778	460m	58.916	67.348
DP1013	DP	10m or Refusal	Refusal is N>10	483563	616716	350m	51.583	60.799
DP 1014	DP	8m or Refusal	Refusal is N>10	483500	616653	260m	45.583	51.402
DP 1015	DP	5m or Refusal	Refusal is N>10	483439	616561	150m	38.249	41.005
DP 1016	DP	5m or Refusal	Refusal is N>10	483402	616469	50m	32.557	34.335

Table 2.4 – Borehole Schedule

Cable Percussion Boreholes							
ST No.	Type	Schedule Depth (m)	Co-ordinates		Chainage	Proposed EL	Existing EL
			Easting	Northing			
BH1001	CP	5m or to rock	484228	616868	1050m	62.625	59.617
BH1002	CP	5m or to rock	484129	616878	950m	61.440	60.398
BH1003	CP	5m or to rock	484029	616880	850m	60.835	55.569
BH1004	CP	5m or to rock	483910	616857	728m	63.820	63.258
BH1005	CP	8m or to rock	483814	616833	630m	65.103	67.904
BH1006	CP	10m or to rock	483718	616806	530m	63.054	69.378
BH1007	CP	10m or to rock	483611	616752	410m	55.583	65.370
BH1008	CP	10m or to rock	483533	616690	310m	48.916	56.718
BH1009	CP	8m or to rock	483470	616613	210m	42.249	44.968
BH1010	CP	5m or to rock	483418	616516	100m	34.916	37.723

Table 2.5 – Rotary Core Schedule

Rotary Cores								
RC No.	Type	Schedule Depth (m)		Co-ordinates		Chainage	Proposed EL	Existing EL
		RO	RC	Easting	Northing			
RC1001	RC	5m or to rock	3m into rock	484228	616868	1050m	62.625	59.617
RC1002	RC	5m or to rock	3m into rock	484129	616878	950m	61.440	60.398
RC1003	RC	5m or to rock	3m into rock	484029	616880	850m	60.835	55.569
RC1004	RC	5m or to rock	3m into rock	483910	616857	728m	63.820	63.258
RC1005	PG	N/A	8m Standpipe	483814	616833	630m	65.103	67.904
RC1006	PG	N/A	10m Standpipe	483718	616806	530m	63.054	69.378
RC1007	PG	N/A	12m Standpipe	483611	616752	410m	55.583	65.370
RC1008	PG	N/A	12m Standpipe	483533	616690	310m	48.916	56.718
RC1009	PG	N/A	8m Standpipe	483470	616613	210m	42.249	44.968
RC1010	PG	N/A	8m Standpipe	483418	616516	100m	34.916	37.723

Table 2.6 – Geophysics Schedule

Geophysical Survey Locations						
Geophysical survey location ID.	Area	Remarks	Coordinates (ITM)			
			Start Point		End Point	
			Easting	Northing	Easting	Northing
GPR1001	1.1ha	Ground Penetrating Radar Survey	483174.845	616422.845	483527.639	616413.516
GPR1002	0.2ha	Ground Penetrating Radar Survey	483731.630	617009.576	483906.821	616776.236

Notes

1. CP = Cable Percussion, RO = Rotary Open Hole, RC = Rotary Core, PG = Polymer Gel Geobor S rotary coring, TP = Trial Pit, DP = Dynamic Probe,
2. Coordinates to Irish Transverse Mercator (ITM) and reduced levels to Malin Head Datum required for all BH i.e. CP and RC (incl. RO/RC & PG), TP and ST.
3. Dynamic probing shall continue to refusal if readings of No. blows per 100mm greater than or equal to 5 have not been obtained by the depths scheduled.
4. Drilling shall continue until the lowest level is reached where the depths scheduled for rotary coring specify a depth into rock.
5. Scheduled depths of rotary coring refer to depth into competent rock. Competent rock has an ROQ >40%. If rock core extracted to the scheduled depth does not meet this requirement, the Employers representative must be contacted before completion of the borehole.
6. Groundwater samples are to be taken from all pond water sources encountered during this investigation as specified by the Employer's representative.
7. Undisturbed sampling is required in cohesive soils.
8. Standard penetration tests are to be carried out as per the Specification.

The above Schedule of Investigations and the Particular Requirements for Sampling and Testing in Schedule 1 may be subject to review on receipt of the completed Bill of Quantities.

Schedule 3: Investigation Supervisor's Facilities

[Not Used]

Schedule 4: Specification Amendments

The following clauses are amended:

At several locations:

For: "Conditions of Contract"

Read: "Contract"

When Reading the Following Documents:-

Specification and Related Documents for Ground Investigation in Ireland (2nd Edition 2016)

The word "Engineer" shall read "Investigation Supervisor"

The following clauses are amended:

Clause 3.8 General Safety Requirements

Add the following text:

"The Contractor shall provide the name and contact number of a locally based member of staff who can be contacted (24 hours, 7 days) by the Investigation Supervisor, the local Authority and An Garda Síochána in the event of an emergency in connection with the works".

"Unless the Contractor obtains the Investigation Supervisor's written permission, each borehole or rotary core location must be fenced off from the commencement of work at that location until restoration is completed. All rutting must be made good immediately, all gates must be kept closed and site kept free of all loose stones, holes, debris or other obstructions. The Contractor shall be deemed to have included this in his rates".

Clause 3.8.3 Indirect Detection of Buried Services

Add the following text:

"The Contractor shall satisfy himself as to the position of any underground services or field drains at each location before excavations and tests commence. Where necessary, test locations shall be relocated to avoid contact with any buried utilities. The Investigation Supervisor and appropriate authority shall be notified immediately of any damage to existing services. The Contractor shall make enquiries to identify the location of any land drains, wells or other domestic utility in proximity to the exploratory hole. Details of such enquires shall be recorded and the information provided to the Investigation Supervisor".

Clause 3.9 Notice of Entry

Delete the first sentence and add the following text:

"The Contractor is required to submit weekly programmes in advance. A notice period of five working days before entry is required to obtain the necessary permissions.

In addition to any notices required to be given under the Conditions of Contract, the Contractor must provide a **minimum of two days notice to the landowner and/or occupier** before accessing their lands".

Clause 3.10 Access Routes

Title description to be changed from 'Access Routes' to 'Access to Site'

Delete the first sentence and add the following text:

"Access to the site for the purpose of carrying out geotechnical investigations will be agreed with the Employer and the Investigation Supervisor and the Contractor shall co-ordinate access requirements with the Investigation Supervisor. The Contractor shall provide sufficient notice to the Employer to arrange access to Site. The Contractor shall provide details of dates when

access is required to carry out the investigations and the method statements required to carry out the Works.

The Contractor will comply with the following conditions for access onto lands:

- (i) Access to exploratory holes(s) shall be along route(s) agreed between the Contractor and the Landowners.
- (ii) All exploratory hole(s) shall be backfilled in fully compacted layers immediately on completion. Any exploratory holes required to be left open overnight shall be fenced off and fully protected.
- (iii) All ground disturbed by the work shall be made good levelled and re-seeded if necessary.
- (iv) Any damage to fences, hedges, walls, gates or any other property found to be due to the execution of the work shall be made good.
- (v) The owner shall be fully indemnified against any claim arising from or relating to the carrying out of this work.
- (vi) The Contractor shall include in his rates for all access difficulties and for reinstatement of access routes damaged during the course of the investigations. In some instances, it may be necessary to lift items of plant over walls as no alternative access exists. Any damage to fences, hedges, walls, gates or any other property due to the execution of the works shall be made good. In some instances exploratory holes will be scheduled in areas of deep peat, the Contractor is deemed to have included for difficult access and set up in his rates."
- (vii) The Contractor shall provide appropriate plant and experienced personnel to complete any site clearance to enable the ground investigation Contract to commence. The Contractor shall be deemed to have included this in his rates.

Clause 3.16.3 Paved areas

Insert the following before the first sentence:

"Prior to excavation, the edges of the exploratory hole must be saw cut to minimise over break."

Delete the text in second paragraph and replace with the following:

'Reinstatement of existing paved areas and the backfilling of trial holes, core-holes and the like shall be in accordance with the requirements of the Guidelines for Managing Openings in Public Roads 2nd Edition (Rev. 1) April 2017.

Clause 3.21 Exploratory Work

Add the following text:

"Inspection Pits shall be of sufficient depth to establish the position of any existing Utilities. Core holes and dynamic probes shall be to the depths as specified or refusal within the limits specified in Schedule 2. The Contractor shall be required to provide, in AGS digital format, in-situ test results, fieldwork logs and results of field laboratory testing on a weekly basis".

Clause 5.4.5 Core boxes, packing, labelling, storing

Add the following paragraph:

"Access for the inspection of the cores by the Investigation Supervisor or his site representative shall be provided by the Contractor for the duration of the Contract".

Clause 5.4.6 Preparation of cores for examination

Delete the reference to "a ground practitioner meeting the requirements of Clause 2.3 item (b)" in the third paragraph and replace with the following:

"The cores shall be examined, described and photographed on site by a senior Geotechnical Engineer or Engineering Geologist with at least 5 years of relevant experience since graduation. Logging shall contain all the additional fracture details required by the Specification and Schedule S1.10.5."

Clause 5.8 Photographs

Add the following paragraphs:

- (h) The core fills a minimum of 50% of the frame.

- (i) Reference photographs are provided to the Investigation Supervisor at commencement for approval.
- (j) always photograph cores within a maximum of 48 hours of recovery.

Clause 6.1 Slit Trenches

Add the following text:

"The purpose of inspection pits is to:

- a) inspect / survey the location and the condition of existing services,

Slit Trenches for the location of underground services shall be of a sufficient size such that all services encountered can be accurately recorded and photographed unless otherwise indicated in Schedule 1. They shall be a minimum of 0.75m wide and shall be excavated by hand to a depth of 1.2m. Inspection pits for examining foundations and masonry arches shall be a maximum of 3m deep and minimum 0.75m wide."

Clause 6.2 Trial pits and trenches

Add the following text:

"The Contractor shall ensure that samples taken from trial pits and trenches are sufficiently large to undertake extensive classification and earthworks testing."

Clause 6.3 Observation pits and trenches

Add the following text:

"The Contractor shall ensure that samples taken from observation pits and trenches are sufficiently large to undertake extensive classification and earthworks testing."

Clause 6.9 Groundwater

Add the following text:

"Sufficient standing time (a minimum of 1 hour) shall be allowed from the time the pit is excavated to its specified depth to observe whether there is any change in the groundwater table or groundwater flow regime."

Clause 6.10 Backfilling

Add the following text:

"Unless otherwise directed by the Investigation Supervisor or his site representative, pits and trenches shall be opened, logged by the Contractor and backfilled on the same day."

Clause 6.12.3 Photographs

Delete and replace with the following:

"A minimum of three photographs shall be taken in the pit and trench using a digital camera, of which at least two shall be of the pit and trench sides and at least one shall be of the arisings."

Clause 7.1 General

Add the following text:

"The Contractor shall be deemed to have included for taking samples large enough to carry out each test as ordered by the Investigation Supervisor. All onsite testing shall be carried out by the Contractor. An offsite laboratory which has the approval of the Investigation Supervisor may undertake testing which is unable to be undertaken on site. The Contractor shall submit the address of the laboratory and the qualifications of the personnel involved in the supervision and testing of the samples, and also in the preparation of the report, to the Investigation Supervisor for his approval".

Clause 7.7.1 Encountering groundwater

Add the following text after the first sentence:

"If sufficient water enters the borehole over this period, a groundwater sample should be taken."

Clause 11.3 Fencing

Add the following text:

"The fencing shall be maintained in place until such time as the standpipe or piezometer is no longer required, and the equipment and protruding pipework removed. Sheep wire shall be securely fixed to the fencing where the adjacent land use warrants its use or where requested by the Investigation Supervisor."

Schedule 5: Specification Additions

The following clauses are added to the Specification:

18. Planning Permissions and Health and Safety and Environmental Consents

The following Condition is deemed to be incorporated in the Contract:

"The Contractor acknowledges and agrees that insofar as Planning Permission, a Waste License, or other consents or permits (including, without prejudice to the generality of the foregoing, licenses, permits or consents under or pursuant to any planning, health and safety or environmental legislation, regulation or enactment), may be required to be obtained in relation to the development of any quarry or other source of materials required for carrying out and completion of the Investigation and/or in relation to any dump site intended to be used by the Contractor for the disposal of material relating to the Investigation, or in relation to any activity involved in the carrying out and completion of the Investigation that the Contractor shall be responsible to obtain, at its own cost, all such permission, licences, consents or permits. Further, the Contractor acknowledges and agrees that it shall not be entitled, notwithstanding any other provisions of the Contract, to any extension of time for the completion of the Investigation by reason of any necessity to obtain, or delay in obtaining any such Planning Permissions, Waste Licence or other licence consents or permits."

19. Programme of Work

The Contractor shall provide a programme of work and resources schedules showing as a minimum the following:

- One Shell and Auger Drilling rig
- One Rotary Coring rig
- One Mechanical Excavator (Minimum 13 tonne)
- One Dynamic Probes Rig
- Groundwater monitoring of standpipes and standpipe piezometers.
- Geophysical Equipment capable of undertaking the required surveys.
- Reinstatement

In addition the Contractor should take into account the time required for monitoring water ingress in each exploratory hole, chiselling through obstructions, moving rigs and setting up at each borehole location and the standing time included in the Bill of Quantities into his programme.

20. Water for Works

The Contractor shall make his own arrangements for bringing water to the site of each borehole, and shall supply all pipes, tanks, transport, etc., that he may require for this purpose. The Contractor shall be deemed to have included this in his rates.

21. Staging, Platforms etc.

The Contractor shall supply, erect and remove on completion all staging, platforms, benching, etc., and required for the coring and trial pits in the prevailing topography.

22. Prevention of the Spread of Animal Diseases

The Contractor should adhere to the Animal Health and Welfare Act 2013 and follow the code of practices and also comply with the DOELG Code of Practice for Farm visits.

23. Protection of the Environment

The Contractor shall follow the Protection of the Environment Act 2003 by following the necessary Code of Practices. The Contractor shall comply with the requirements included in clause 26 of Schedule 5.

24. Management of Contract

Principle Chartered Geotechnical Engineer/Professional Geologist (Project Director)

In order to provide the appropriate level of management of the Site Investigation Contract a Principle Chartered Geotechnical Engineer/Professional Engineering Geologist or similar approved by the Employer's Representative shall be appointed by the Contractor as Project Director to manage all aspects of the Contract as required by the Contract. The name and CV of the Principle Chartered Geotechnical Engineer/Professional Engineering Geologist (Project Director) shall be indicated in the Tender submission and shall be subject to approval by the Employer's Representative which approval may be withdrawn at any time. The Principle Chartered Geotechnical Engineer/Professional Engineering Geologist (Project Director) shall have not less than 10 years experience in ground investigation and geotechnical works, in both field operations and reporting and shall be a permanent employee of the Geotechnical Contractor.

The Principle Chartered Geotechnical Engineer / Professional Engineering Geologist (Project Director) shall be responsible for the technical direction and output of the whole investigation. The Principle Chartered Geotechnical Engineer/ Professional Engineering Geologist shall sign the final factual report.

Project Chartered Geotechnical Engineer/Professional Geologist (Project Manager)

The Contractor shall provide full time on site, for the duration of the Ground Investigation Works, a Chartered Geotechnical Engineer/Professional Geologist, or similar approved by the Employer's Representative, with a minimum of 5 years post charter experience in similar ground investigation and geotechnical works. The Chartered Geotechnical Engineer/Professional Geologist shall be subject to the approval of the Employer's Representative but this approval may be withdrawn at any time. The name and CV of the Chartered Geotechnical Engineer/Professional Geologist shall be included in the Tender submission. The Chartered Geotechnical Engineer/Professional Geologist shall be in the employment of the Ground Investigation Contractor.

The Chartered Geotechnical Engineer/Professional Geologist will be the key member of the Ground Investigation Contractor's personnel responsible for day-to-day liaison with the Investigations Supervisor with respect to the progress and initial results of the Ground Investigations Works on site, including consultation, as appropriate, with respect to any amendments to the location or extent of investigations at individual exploratory hole locations on the basis of ground conditions encountered on site.

The Chartered Geotechnical Engineer/Professional Geologist shall prepare a daily report and perform other supervision and technical duties as required by the Contract whenever site works are being undertaken, and shall be responsible for ensuring adherence to proper excavation, sampling and in-situ testing methods and for reporting/logging and photography on site of the rock cores within 48 hours of core extraction, and ensuring all logging shall be in accordance with IS EN14688-1, IS EN14689-1 and BS 5930. This Geotechnical Engineer or Engineering Geologist shall co-ordinate the work of the other Logging Engineers, ensuring the continuity and quality of the description and approach to testing in the field and involved in the investigation.

Appendix I – Groundwater Standpipes and Piezometers

Refer to Appendix I – Groundwater Standpipes and Piezometers of 'Specification and Related Documents for Ground Investigation in Ireland', Engineers Ireland, Second Edition 2016

Appendix II – Ground Gas Monitoring Standpipe

[Not Used]

PRICING DOCUMENT

Preamble to Pricing Document

Preamble to Pricing Document

The Preamble for this Bill of Quantities is set out in the "Specification and Related Documents for Ground Investigations in Ireland 2nd Edition 2016 – Annex 1 Bill of Quantities for Ground Investigation"

Preamble amendments and additions

Clause (1) add:

'(j) Compliance with the NRA code of practice for the prevention of the spread of animal diseases". See Schedule 5, Specification Additions, Clause 22'.

Clause (11) add:

'and taking measures to prevent damage in environmentally designated areas and other sensitive locations. In particular compliance with the requirements of Clause 26 of schedule 5'.

Clause (9) (f) replace:

"Volume calculated as measured length by measured depth by specified width for trial and observation trenches" with "Rates for depths to include for the excavation of the full volume of the trial hole or slit trench and the associate reinstatement."