

**CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT  
GEOTECHNICAL ENGINEERING OFFICE**

**GROUND INVESTIGATION NOTE NO. 1/2022  
HANDLING OF LAND/MARINE GROUND INVESTIGATION,  
GEOPHYSICAL SURVEY AND  
LABORATORY TESTING REQUESTS**

**1. INTRODUCTION**

- 1.1 The purpose of this Note is to enable Government departments (clients) and their consultants to make the best use of the land/marine ground investigation (GI), geophysical survey (GS), and soil and rock laboratory testing (LT) services provided through the term/service contracts of GEO. Clients and consultants should provide copies of this Note to their project engineers and other staff engaged in arranging GI, GS, or LT services.
- 1.2 All requests are dealt with in accordance with Section 1.6, Chapter 4 of the Project Management Handbook (PAH).
- 1.3 The financial limits for individual requests normally accepted by GEO are \$4M for land GI or GS and \$8M for marine GI. A department or its consultants may consider to let an individual GI contract or make provisions in their capital works contract for carrying out GI or GS works with value exceeding these limits. Depending on workload of the GEO GI Sections, the requests with costs exceeding these limits may be considered if the works are urgent, within the scope of the GEO GI/GS term contracts, and the term contractor involved has spare capacity and can complete the service within the time frame stipulated.

**2. RESPONSIBILITIES OF GEO**

- 2.1 Three land based GI term contracts and one marine GI/GS term contract are administered by the Geotechnical Projects Division. The Service Manager for the Contract is the Chief Geotechnical Engineer/Geotechnical Projects (CGE/GP). Requests for GI and GS services under these contracts should be addressed to CGE/GP.
- 2.2 Soil and rock laboratory testing service contracts are administered by the Standards and Testing Division. The Government Representative of those contracts is the Chief Geotechnical Engineer/Standards & Testing (CGE/S&T). Requests for soil and rock laboratory testing should be addressed to CGE/S&T (Attn: SGE/L) direct.
- 2.3 Funding for the requested GI/GS/LT services, in the form of an Allocation Warrant (AW) or Works Expenditure Authorization (WEA), should be sent to CGE/GP or CGE/S&T, as appropriate.
- 2.4 Service Manager's Delegates (SMDs) or Inspecting Officers (IOs) nominated by the corresponding CGE are normally Geotechnical Engineers/Engineers in the divisions. Several SMDs/IOs may be nominated under a term/service contract. A SMD/IO is responsible for the following aspects of contract administration:

- (a) producing initial cost estimates for investigation/testing requests;
- (b) arranging and attending meetings (on site/Affected Property, if necessary) with clients/consultants and term contractors/service contract laboratories, and subsequently producing final cost estimates;
- (c) planning and allocating the contractor's resources to meet clients' requirements;
- (d) issuing Task Orders/Service Orders (TO/SO) to the term contractors/service contract laboratories;
- (e) conducting periodic site/Affected Property or laboratory visits to ensure that the contract Specification is followed and a good standard of workmanship, safety and environmental awareness is maintained;
- (f) issuing Service Manager's Instructions to the term contractors;
- (g) monitoring the service progress;
- (h) checking the quality of preliminary records and Final Fieldwork or Laboratory Testing Reports;
- (i) checking and certifying completion of TO/SO and payment for the service;
- (j) issuing and assessing compensation events, handling early warnings and imposing liquidated damages/delay damages, if appropriate, and
- (k) reporting on the contractors' performance.

2.5 Under the Land (Miscellaneous Provisions) Ordinance, CEDD is the Permittee under Excavation Permits (XPs) issued by Highways Department (HyD), while the GI term contractor becomes the Nominated Permittee. For XPs issued by Lands Department, the term contractor becomes the Permittee. The Nominated Permittee and Permittee are responsible for complying with their respective permit conditions. Upon completion of the required processes for XP application by the client/consultants (see Section 3.1.2(f)), and provision of a fee related to the XP application via a AW/WEA by the Client, GEO will submit the XP application via the XPMS to HyD, settle the payment for prescribed XP fee, provide the XP conditions to the term contractor, and report notification of commencement/completion of service.

2.6 The GEO GI term contractors will not undertake inspection pits/trial pits/trenches excavation that are solely, or as considered by the SMDs, for the purpose of locating public utilities.

### **3. RESPONSIBILITIES OF THE CLIENT/CONSULTANTS**

#### **3.1 Ground Investigation and Geophysical Survey**

3.1.1 The purpose of the GI/GS, locations of the proposed and existing investigation stations, estimated drillhole depths and strata/layer thickness, requirements for drilling, sampling, field testing and instrumentation should be provided in each GI/GS request, as appropriate. One print and a digital copy of the drawing/plan, and photographs showing

the investigation station locations/areas should also accompany the request. Co-ordinates of each proposed investigation station should be provided where setting out by survey is required (which should be requested when the GI request is first made).

3.1.2 Before the issuance of a TO for GI/GS service, the following items should be completed unless otherwise agreed with the SMD beforehand:

- (a) The client/consultants shall attend a meeting(s) with GEO and the term contractor to assess the conditions of the site/Affected Property, confirm the locations of the investigation stations and also the form of access, including the need of XP application, where necessary.
- (b) The details and locations of any drainage, services and utilities in the vicinity of the investigation stations must be provided by the client/consultants (see Appendix 1), and forwarded to GEO prior to the meeting if possible. The client/consultants should ensure that the date of providing details and locations by utility undertaker from the Date of Commencement for the TO should not be more than 3 months for electricity supply lines and gas mains, and 6 months for drainage, telecom and other utilities. In case of the lapse of this 3 months' period for electricity supply lines and gas mains, the client/consultants is required to re-obtain the relevant updated information to GEO prior to the issuance of the TO. For cases of utilities information other than those with vital safety concerns, i.e. electricity supply lines and gas mains, the updates should also be supplemented to GEO as soon as practicable. The SMD may refuse to issue the TO if he/she considers the proposed GI works may adversely affect the utilities and/or endanger the safety of the contractors' staff if the full set of the updated information is not timely provided to GEO.
- (c) For sites/Affected Properties falling within the Railway Protection Area (DEVB TC(W) No. 1/2019), Sewage Tunnel Protection Area (ETWB TCW No. 28/2003), tunnel/cable protection zones, drainage or waterworks reserves, permission of the relevant parties to carry out the GI service and the extent of the relevant protection areas/zones must be obtained by the client/consultants.
- (d) For GI/GS service within sensitive areas listed in Category Q in Part I of Schedule 2 of EIAO, the client/consultants should check with EPD whether an Environmental Permit is required. The client/consultants should also check with relevant authorities whether the GI/GS service is permitted under the Town Planning Ordinance (Cap. 131).
- (e) All land matters including XP applications and compensation issues, must be resolved by the client/consultants. The client/consultants is responsible for liaising and obtaining all the necessary permissions from stakeholders, which include but not limited to relevant Government Departments, statutory authorities, maintenance parties, owners and/or occupiers of the site/Affected Property and associated access, to enable the GI term contractor to enter the site/Affected Property to carry out the works/provide the service. Written confirmation must be provided for such permissions, together with the checklist for issue of GI TO (see Appendix 1).
- (f) For sites/Affected Properties where XP is required, the client/consultants is responsible for the overall process for obtaining the XP. Their responsibilities include but not limited to plan pre-registration and registration, permit period assessment, case coordination, submission of and coordination for traffic proposals,

application for XP extension. The GI term contractor will provide the Lighting, Signing Guarding (LSG) or Temporary Traffic Management (TTM) proposals to the client/consultants for their submission. If found necessary by the SMD, the clients may be asked to provide funding covering these works prior to the issuance of the GI TO as an advance work.

- (g) The client/consultants should observe the requirements stipulated in the ETWB Technical Circular (Works) No. 18/2005 and relevant updates in respect of conflict of interest and debarring. A declaration of no conflict or potential conflict of interest with the contractor is to be made (see Appendix 4). They should inform GEO in writing otherwise.
  - (h) The client/consultants should observe the latest guidelines promulgated by the DEVB in regard to tree risk assessment/management and tree preservation. It is the client/consultants' responsibilities to manage all tree related matters relating to the GI TO. All landscaping related works are not covered under the GI term contracts.
- 3.1.3 The sampling technique specified should provide sufficient quantities of materials and samples of adequate quality for laboratory testing, if required. The geotechnical parameters to be derived by the GI should preferably be mentioned in the GI request.
- 3.1.4 Any monitoring works required after the installation of piezometers and other instruments carried out under the GI term contracts must be separately arranged by the client/consultants.
- 3.1.5 The client/consultants should give an advance notice of the required GI/GS/LT to CGE/GP and/or CGE/S&T for their resources planning. The project programme shall allow time for resolving the matters in Paragraph 3.1.2 (a) to (h) above, and for commencement and completion of the GI/GS/LT works. Usually, at least four months lead time should be planned for major GI works.
- 3.1.6 The client/consultants should identify and inform GEO a designated area for storage of soil and rock samples within one month before the date of completion of the GI works set out in a TO. GEO would arrange its GI term contractor to deliver the samples to the designated area or a designated laboratory as per the client/consultants' advice within one month after completion of the TO. All the undelivered samples will be disposed of without further notice to the client/consultants.
- 3.2 Soil and Rock Laboratory Testing
- 3.2.1 The client/consultants should provide detailed requirements for laboratory testing using the schedules in Appendix 2, as early as possible. In case of doubt or difficulty in preparing the laboratory testing schedule, the client/consultants should seek clarification and advice from CGE/S&T as soon as possible.
- 3.2.2 The standard test methods given in GEOSPEC 3 "Model Specification for Soil Testing" should be adopted. The test method number should be specified where more than one option is available for a particular test (e.g. moisture content determination at 45°C or 105°C; particle size distribution determination by wet sieving with or without the use of dispersant). For triaxial and direct shear tests, the required moisture content determination test method number should also be specified. Guidance on the minimum mass of soil required for testing of disturbed samples is given in Appendix 3.

- 3.2.3 Specification of the type of classification tests for saprolitic, residual and colluvial soils should follow the guidelines in GEOSPEC 3.
- 3.2.4 For compaction tests on saprolitic, residual and colluvial soils, the materials should be assumed to be susceptible to crushing unless it can be shown otherwise.
- 3.2.5 The tests will usually be carried out at a service contract laboratory or the Public Works Central Laboratory (PWCL), as assigned by CGE/S&T.
- 3.2.6 For 'special' tests (i.e. tests not included in the contract Specification), a detailed test specification, which should contain the standard test method (where available) or the key test procedures, and the calibration procedures (where appropriate), should be provided with the testing schedule. Tests on dummy samples may need to be specified to check if the test specification can be followed.
- 3.2.7 Laboratory tests for land contamination should be procured separately by the client/consultants. To ensure timely delivery of samples for testing, CGE/GP should be advised of the laboratory appointed to carry out these tests before or immediately after commencement of the corresponding GI and/or sampling works to be carried out by Geotechnical Projects Division's GI term contractors.
- 3.3 Contractor's Working Hours
- 3.3.1 The normal working hours of the GI/GS term contractors and service contract laboratories under the Contract are 7 a.m. to 7 p.m., Monday to Saturday (excluding General Holidays). The client/consultants should make arrangements for effective liaison with the term contractor/service contract laboratories to ensure that unwarranted standing time payments will not be incurred.
- 3.4 Professional and Technical Supervision
- 3.4.1 Technical supervision of GI/GS should be provided by the client/consultants. According to Section 4.3, Chapter 7 of the PAH and Geoguide 2 "Guide to Site Investigation", GI/GS should normally be supervised full-time by technical personnel with at least one year of experience in GI and part-time by a suitably qualified and experienced engineer or geologist. In certain cases, e.g. GI service in Scheduled Areas and Designated Area of Northshore Lantau, more stringent supervision requirements on the supervision personnel would be required as per the PAH. It is the duties of the client/consultants to maintain good record of site/Affected Property activities, especially for complicated TO, such as those involving potential claims/compensation events, new items with built-up rates or where items where Contract Rates do not apply.
- 3.4.2 The client/consultants should also provide an appropriate level of supervision for laboratory testing. Supervision by experienced geotechnical personnel is particularly important for the triaxial and direct shear strength tests, as well as oedometer tests. The client/consultants should arrange for supervision of all tests, except for the simple classification tests. The materials scheduled for testing should be examined to confirm that they are as originally anticipated, and that they are representative and suitable for testing. This examination can only be done at the laboratory on extrusion of the samples from the sampling tubes.

- 3.4.3 The details of the personnel proposed to supervise land and marine GI, GS and LT should be submitted to the SMD/IO of the respective contracts prior to commencement of the GI service and laboratory testing. The client/consultants will be notified by the SMD/IO if the proposed supervision is considered inadequate.
- 3.4.4 The client/consultants is responsible for the technical supervision of fieldwork, verification of reinstatement, daily cleaning/weekly tidying works and the site handover to the owners of the site/Affected Property upon completion of GI fieldworks and testing in the laboratory to ensure that the scope of the services, the methods used and the standard of workmanship comply with their requirements and Specifications of the GEO term/service contracts. This includes verifying the final depth of drillholes. Any deficiency should be reported to the SMD/IO as soon as practicable. The contract Specification for all land and marine GI contracts, together with soil and rock testing service contracts, can be found at the DEVB Works Group Intranet Portal under the Procurement & Costing pull-down manual or accessed at this link <http://portal.etwgi.etwb.hksarg/>.

Staff deployed for site supervision should be fully conversant with the requirements of the project, the standard of workmanship required, the contract Specification and the procedures in this Note, so that effective and timely decisions can be made on site/Affected Property or at the laboratory (after consultation with the designer/project engineer where necessary). The site supervisory staff should confirm this point to GEO in writing prior to the commencement of service (see Appendix 4). The performance of these staff should be monitored by the client/consultants. The client/consultants should ensure that the proposed full-time technical personnel(s) for GI/GS service under a TO is/are full time on site/Affected Property during the fieldwork period of the TO and, in case the full-time technical personnel(s) is/are not available, appropriate arrangement of replacement staff agreed with GEO should be implemented immediately. All staff members attending site/Affected Property should be properly trained in construction site safety and should be provided with appropriate personal protective equipment.

### 3.5 Excavation Permit Application, Co-ordination and Monitoring

- 3.5.1 Under the Land (Miscellaneous Provisions) Ordinance (LMPO), CEDD is the Permittee for excavation to be carried out on streets including roadside slopes maintained by HyD. The client/consultants should liaise with the SMD in advance on the requirements of XP and the implication on the programme of the GI service.
- 3.5.2 The client/consultants is responsible for the overall administrative work, including funding arrangement, and provision of the required information for XP applications and all co-ordination and liaison with other parties, e.g. other XP applicants planning to carry out excavations in the vicinity. GEO's GI term contractor is responsible for the preparation of the required LSG/TTA plans for submission to XPMS by the client/consultants under a separate TO as mentioned in para. 3.1.2(f).
- 3.5.3 For GI service on unleased land (other than streets maintained by HyD), clients/consultants are advised to obtain a "simplified temporary land allocation" (STLA) from the relevant DLO to cover the site(s)/Affected Property(ies) and apply for any extensions required on the advice of SMDs. Otherwise, the client/consultants shall apply for an XP from DLO. For service not requiring lateral support (drillholes, slope stripping and trial pits  $\leq 1.2\text{m}$  deep) and satisfying the requirements of LMPO, exemption from these requirements may be granted by the respective Chief Engineer of the Project Office

under the provisions of the Ordinance provided that DLO has expressed no objection to the GI works.

#### **4. ISSUE OF TASK ORDERS/SERVICES ORDERS**

- 4.1 After receipt of all information, the SMD/IO will send a draft TO/SO to the client and its consultants (if one has been appointed) for comment. When comments are received along with the availability of funds confirmed and the actions listed under Paragraph 3.1.2 completed, the TO/SO will be issued to the term contractors/service contract laboratories. The fieldwork or laboratory testing commencement date will be decided by the SMD/IO. A copy of the TO/SO issued will be forwarded to the client/consultants.
- 4.2 For soil and rock laboratory testing carried out at the PWCL, SO will not be issued as no payment is involved, and the PWCL will liaise directly with the client/consultants.

#### **5. INSTRUCTIONS UNDER THE CONTRACT**

- 5.1 All instructions to the term contractors/service contract laboratories should be made through the SMD/IO except for minor items of service (see Paragraph 5.2 below). The SMD/IO's instructions are made in the form of a Service Manager's Instruction to the TO or Variation Order to the SO (or in some cases, a separate TO/SO). For proper accounting and execution of the Contract, all instructions (or changes to instructions) to the term contractors/service contract laboratories should be given in writing.
- 5.2 Requests may be given directly to the term contractors/service contract laboratories by the client/consultants' representative on site/Affected Property for minor variations in the scope of service, e.g. amending depths of sampling, drillholes and piezometer tips, confining pressure in laboratory testing, etc. Requests of this nature should be recorded in the Site/Laboratory Log Book, which must be signed by the client/consultant's supervisory staff at the time of request, with the TO/SO No. indicated. The contractor is instructed not to follow any verbal instructions from the client/consultants on even minor variations in the scope of the service as above unless the instructions are confirmed in the Site/Laboratory Log Book. For major variations to the service, i.e. those that significantly increase or decrease the value of a TO/SO, prior agreement with the SMD/IO must be sought.
- 5.3 Where it is necessary to issue a request outside the GEO's office hours (which are 8:30 a.m. to 5:45 p.m. Monday to Friday excluding General Holidays), but not involving major change to the service, the SMD/IO should be informed as early as possible on the next working day.
- 5.4 The Site and Laboratory Log Books must be signed by all visitors to the site/Affected Property or laboratory regardless whether any amendments to the TO/SO are requested. The time of arrival and departure of the supervising staff from the client/consultants should also be recorded.

#### **6. SUBMISSION OF PRELIMINARY RECORDS AND FINAL REPORTS**

##### **6.1 Ground Investigation and Geophysical Survey**

6.1.1 The term contract specification stipulates the following time limits for the submission of preliminary records/reports and Final Fieldwork Reports:

- (a) For land and marine GI, the contractor is required to submit preliminary records of drillhole, trial pit, trial trench, corehole, vibrocore, slope surface stripping and field test within six working days of the completion of the individual investigation station or test to which the records refer. Ground levels and coordinates of drillholes and vibrocores are also available within similar time frame after completion of all the fieldwork upon request. For GS, the contractor is required to submit a preliminary report within 18 working days of completion of the fieldwork, except for echo sounding on its own, water sampling or grab sampling, for which preliminary reports are not required.
- (b) The Service Manager or his representative/delegate is required to provide comments to the contractor on all preliminary land GI or marine GI records or the preliminary GS reports, if any, within ten working days of the receipt of the preliminary records/reports. Hence the client/consultants should provide comments on the records/reports received in accordance with the time frame stipulated in Paragraph 6.1.2 below.
- (c) The contractor is required to submit the Final Fieldwork Report within the periods below, following the receipt of all comments on the preliminary records:

Land GI	
GCO probes or geophysical testing only	6 working days
Land GI and Marine GI	
up to 5 investigation stations	6 working days
6 – 20 investigation stations	12 working days
over 20 investigation stations	18 working days
GS	
Final reports (echo sounding survey on its own, water sampling or grab sampling)	12 working days of completion of fieldwork
Others	6 working days
Where additional drillhole records for interpretation of survey results are provided with comments	12 working days

6.1.2 The client/consultants should ensure that comments on preliminary GI records (including hand-written draft logs) or GS reports are forwarded to the SMD within seven working days of receipt of each set of records/report. If there is no comment, the client/consultants should also confirm this in writing. If additional time is required for comment, the SMD should be informed as soon as possible and within the prescribed period. Otherwise, the SMD would assume that there is no comment and GI term contractor may commence backfilling / reinstatement of the GI station(s) for public safety reasons without further notice. GI station(s) located on public roads/pavements may subject to a shorter notice pending on SMD’s assessment of the site safety condition.

6.1.3 When commenting on the preliminary drillhole/vibrocore records, the client/consultants should note that the contractor is required to follow Geoguide 3 "Guide to Rock and Soil Descriptions" and the "Required Presentation of Information" (refer to the relevant



contract Specification, see Paragraph 3.5.4). The client/consultants' supervisory staff should check and confirm the accuracy of the records produced.

- 6.1.4 The client/consultants should note that delays in the submission of comments on the preliminary records/reports may result in a legitimate claim for an extension of time/compensation event by the contractor, and a delay in the submission of the Final Fieldwork Report.

## **6.2 Soil and Rock Laboratory Testing**

- 6.2.1 One hard copy and one CD-ROM copy of the Final Laboratory Testing Report will normally be provided to the client/consultants. If additional copies are required, the client/consultants should request this when the testing schedule is submitted to CGE/S&T (Attn: SGE/L).
- 6.2.2 There are no set reporting times stipulated in the Contract, but preliminary results can be provided by the contractor to a named person by fax or e-mail on a weekly or bi-weekly basis if the client/consultants requests this in writing. The contractor is required to submit the Final Laboratory Testing Report to CGE/S&T (Attn: SGE/L) on or before the completion date stated on the SO. In the case of tests carried out by PWCL, the Final Laboratory Testing Report will be issued to the client/consultants on or before the estimated completion date previously advised by PWCL.
- 6.2.3 The client/consultants should check the accuracy of the specimen descriptions for soil consolidation and strength tests to ensure that relevant observations are reported. It should be noted that the specimen descriptions may differ from the sample descriptions in the GI Final Fieldwork Report, which are normally based on inspections at the ends of tube samples.

## **7. FEEDBACK**

The client/consultants will be asked to complete and return a Performance Appraisal form (provided separately on completion of a TO/SO) to the SMD/IO. Other feedback on the performance of the term contractors/service contract laboratories is welcome. Feedback should be directed to CGE/GP or CGE/S&T, as appropriate.

**APPENDIX 1 (Sheet 1 of 2)**

**Checklist for Utilities and Underground Structures Checking for GI Works**

Project: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

GEO Ground Investigation Task Order No: \_\_\_\_\_

	Plans provided to GEO	Date of reply from utility authorities	Plans not available with remarks
Drainage Services Department	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Fire Services Department	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Water Supplies Department	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Transport Department	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Public Lighting	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
CLP Power/Hong Kong Electric	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
HK & China Gas	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
PCCW	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
HK Cable TV	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Hutchison Global Crossing	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
HK Broadband Network	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Towngas Telecommunication Fixed Network	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
SmarTone Communications	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
TraxComm	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
HKC Network	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Underground Structures (underpass/tunnel/MTR)	<input type="checkbox"/>	_____	<input type="checkbox"/> _____
Others : _____	<input type="checkbox"/>	_____	<input type="checkbox"/> _____

I confirm that utilities search is comprehensive and that all relevant plans (**1 hard and digital copy each**) are transmitted herewith.

Signed : \_\_\_\_\_ Post : \_\_\_\_\_ Date : \_\_\_\_\_  
(Name : \_\_\_\_\_ )

Consultant Firm / Department: \_\_\_\_\_

## Checklist for Issue of GI Task Order (for use by Client/Consultants)

APPENDIX 1 (Sheet 2 of 2)

Name of Client's Contact Person: \_\_\_\_\_

Tel. No. \_\_\_\_\_

Fax. No. \_\_\_\_\_

Name of Consultants' Contact Person: \_\_\_\_\_ of \_\_\_\_\_

Tel. No. \_\_\_\_\_

Fax No. \_\_\_\_\_

Activities	Yes	Date Action Completed	Not Applicable	Remarks
1. Desk Study report/results furnished to GI Section	<input type="checkbox"/>		<input type="checkbox"/>	
2. Site meeting(s) carried out	<input type="checkbox"/>		<input type="checkbox"/>	
3. Permission granted for GI works in/close to: MTRC Protection Zone Scheduled Area Tunnel (incl. tunnel reserve)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
4. Environmental Permit/exemption granted for Ecologically Sensitive Areas (i.e. country parks/ special areas, conservation areas/ sites of special scientific interest) or Conservation Area under OZP of Town Planning Ordinance (Cap. 131)	<input type="checkbox"/>		<input type="checkbox"/>	
5. Land matters resolved with documentation for all access/occupancy rights granted for GI works(e.g. STLA, consent from maintenance department/ Village Representative/ affected occupants/ Management Office)	<input type="checkbox"/>		<input type="checkbox"/>	
6. Reinstatement of vegetation agreed with LCSD/maintenance department	<input type="checkbox"/>		<input type="checkbox"/>	
7. 2 sets of utilities plans together with completed checklist (Appendix 1 of GI Note No. 1/2022) passed to GI (CLP/HKE&GAS updated to nearest 3 months and others 6 months)	<input type="checkbox"/>		<input type="checkbox"/>	
8. Traffic arrangement proposal (including TTA for unloading and loading) agreed by Police and Transport Department	<input type="checkbox"/>		<input type="checkbox"/>	
9. Final GI plan and schedule provided for preparation of draft WO	<input type="checkbox"/>		<input type="checkbox"/>	
10. Comments on draft TO given to GI Section	<input type="checkbox"/>		<input type="checkbox"/>	
11. Excavation Permit (preliminary consent stage)	<input type="checkbox"/>		<input type="checkbox"/>	
12. Site supervisory staff agreed and signed Appendix 4 of GI Note No. 1/2022 passed to GI Section	<input type="checkbox"/>		<input type="checkbox"/>	
13. Funds confirmed (WEA/AW issued)	<input type="checkbox"/>		<input type="checkbox"/>	
14. Others				

Prepared by: \_\_\_\_\_ Title: \_\_\_\_\_ Affiliation: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX 2 SOIL TESTING SCHEDULE

SHEET ..... OF .....

CLIENT OFFICE ..... GROUND INVESTIGATION TO No. .... PREPARED BY ..... OF .....

PROJECT No. & NAME ..... TELEPHONE No. .... FAX No. ....

Drillhole / Vibrocore / Trial Pit No.	Sample Depth (m)	Sample No. / Type  (Note 2)	Description of Material Type  (Note 3)	MC	AL	PSD	Triaxial Compression Test					Oedometer Test			Organic Matter Content	Mass Loss on Ignition	Sulphate Content	Water-Soluble Chloride Content	pH value	carbonate content	resistivity	redox potential	Other Tests  (Note 13)							
				GEO SPEC 3 Test No.			Type	Consolidation Pressure (kPa)			GEO SPEC 3 Test No. 14.1 / 14.2 (if applicable)	Loading / Unloading Pressures (kPa)	Remarks	GEO SPEC 3 Test No.										BS 1377:Part 3:1990						
				GEO SPEC 3 Test No. 15.1 / 15.2 / 15.3 (if applicable)	1st Stage	2nd Stage		3rd Stage	9.1	9.2				9.3										9.4	9.5	CL. 6	CL. 10	CL. 11		
				(a) 8.1 (b) 8.2 (c) 8.5 (d) 8.6 (e) 8.7	(a) 6.1 (b) 6.2	(a) 5.1 (b) 5.2 (c) 5.3		(Notes 7 & 7a)																					(Notes 8 & 9)	(Notes10 & 11)

**APPENDIX 2**  
**ROCK TESTING SCHEDULE**

CLIENT OFFICE ..... GROUND INVESTIGATION TO No. .... PREPARED BY ..... OF .....

PROJECT No. & NAME ..... TELEPHONE No..... FAX No.....

Drillhole No.	Sample Depth (m)	Sample No.	Core Diameter (mm)	Description of Material Type  (Note 3)	Point Load Test  ASTM D5731-95		Uniaxial Compression Test  ASTM D2938-95	Elastic Modulus and Poisson's Ratio Determination  ASTM D3148-96	Rock Joint Shear-Box Test  ASTM D5607-95	Porosity / Density  ISRM Suggested Method (1981)	Other Tests  (Note 13)
					Diametral	Axial				Using Saturation and Caliper Techniques	

## Notes to Appendix 2:

- (1) To avoid delay, complete this form in its entirety and forward to CGE/S&T (Attn: SGE/L) with every laboratory testing request.
- (2) For Type: P – Piston, M – Mazier, U – Driven Tube, V – Vibrocore, B – Block, D – Bulk (Disturbed), L – Liner.
- (3) Suggested descriptions are: SAND, SILT, CLAY or combinations (Geological origin if known, e.g. FILL, COLL, ALL, MARINE, RS, CDG, HDG, MDG, CDV, HDV). (In accordance with Geoguide 3).
- (4) MC: Moisture Content, specify test type as (a), (b) or (c). For type (c), the test will be performed on the same test specimen unless otherwise specified.
- (5) (Tick if required) AL: Atterberg Limits – Plastic Limit & Liquid Limit tests. PL tests will first be carried out and if the sample is found to be non-plastic, then LL will not be determined. Also, if PSD tests on the same sample indicate the sample contains less than 15% by weight of particles finer than 63  $\mu$ m, then Atterberg Limits will not be determined unless specifically requested.
- (6) PSD: Particles Size Distribution - Wet sieving analysis for medium-grained to coarse-grained material (with or without dispersant)  
 - Hydrometer method for fine-grained material (with or without dispersant)  
 Wet sieving will be carried out first. If the sample contains less than 10% by weight of particles finer than 63  $\mu$ m, then sedimentation analysis will not be performed unless specifically requested. The test type(s) should be specified (viz. (a) or (b), and (c) or (d), plus (e) if required). Refer to Appendix 3 for description of the test types. Test No. 8.7 (2.9.6) is for construction of a continuous particle size distribution curve from the results of wet sieving and sedimentation tests.
- (7) CD : Consolidated Drained Test   S : Single-Stage                         For example : CUS  
 CU : Consolidated Undrained Test with PWP measurement             M : Multi-stage  
 UU : Unconsolidated Undrained Test
- (7a) Specify particle density test: (a) GEOSPEC 3 Test No. 7.1; (b) GEOSPEC 3 Test No. 7.2; or (c) assumed 2.65 Mg/m<sup>3</sup>
- (8) Specify the cell pressure required for UU tests and whether side drain is to be used in CU and CD tests under this column.
- (9) Only triaxial test data will be provided on either CD-ROM or floppy disk. Suggested file name of computer data disk ..... (if required).
- (10) Specify under this column the MC test type required for any triaxial or oedometer testing scheduled. (See note 4)
- (11) For oedometer tests, each increment of loading and unloading should be stated.
- (12) Specify sulphate content test: (a) Total Sulphate of Soil; (b) Sulphate Content of Ground Water; or (c) Sulphate Content of Aqueous Soil Extracts.
- (13) For tests not included in the Standards & Testing Division Laboratory Testing Service Contract Document and GEOSPEC 3, provide a detailed test specification on a separate sheet.

## APPENDIX 3

### Minimum Mass of Soil Required for Testing of Disturbed Samples

Type of Test	Test Method Description	Test No.	Soil Grouping		
		GEOSPEC 3	Fine-grained Soils	Medium-grained Soils	Coarse-grained Soils
Moisture content	Determination of Moisture Content by Oven-Drying at 105 C ± 5 C	5.2			
	Determination of Moisture Content by Oven-Drying at 45 C ± 5 C	5.1	50 g	350 g	4 kg
	Comparative Test for the Determination of Moisture Content by Oven-Drying	5.3			
Liquid and Plastic Limits	Determination of Liquid Limit, Plastic Limit and Plasticity Index	6.1	550 g	1.1 kg	2.2 kg
Particle size distribution (wet sieving)	Determination of Particle Size Distribution by Wet Sieving (with Dispersant)	8.1	150 g	2.5 kg	17 kg
	Determination of Particle Size Distribution by Wet Sieving (without Dispersant)	8.2			
Particle size distribution (sedimentation)	Determination of Particle Size Distribution by Hydrometer Method (with Dispersant)	8.5	250 g	250 g+	250 g+
	Determination of Particle Size Distribution by Hydrometer Method (without Dispersant)	8.6			
Compaction	Determination of the Dry Density/ Moisture Content Relationship of Soils Containing Particles Which are Not Susceptible to Crushing (Using a 1000 cc Mould and 2.5/4.5 kg Rammer)	10.1/10.5	10 kg	10 kg	10 kg
	Determination of the Dry Density/ Moisture Content Relationship of Soils Containing Particles Which are Susceptible to Crushing (Using a 1000 cc Mould and 2.5/4.5 kg Rammer)	10.2/10.6	25 kg	25 kg	25 kg
	Determination of the Dry Density/ Moisture Content Relationship of Soils Containing Particles Which are Not Susceptible to Crushing (Using a CBR Mould and 2.5/4.5 kg Rammer)	10.3/10.7	50 kg	50 kg	50 kg
	Determination of the Dry Density/ Moisture Content Relationship of Soils Containing Particles Which are Susceptible to Crushing (Using a CBR Mould and 2.5/4.5 kg Rammer)	10.4/10.8	80 kg	80 kg	80 kg
Triaxial test	Determination of shear strength of soils using triaxial apparatus	15	See Table 13.1 of GEOSPEC 3		
Direct shear test	Determination of shear strength of soils using shear box apparatus	16			

+ Sufficient to give the stated mass of fine-grained material

Notes:

- The group of soils, as defined below, is based on GEOSPEC 3 Clause 1.2.  
 Fine-grained soils are those with particles not larger than 20 mm and not more than 10% by weight retained on a 2 mm test sieve.  
 Medium-grained soils are those with particles not larger than 37.5 mm, more than 10% by weight retained on a 2 mm test sieve but not more than 10% by weight retained on a 20 mm test sieve.  
 Coarse-grained soils are those with more than 10% by weight retained on a 20 mm test sieve but not more than 10% by weight retained on a 37.5 mm test sieve.
- The actual mass of sample required shall be assessed by multiplying the mass given above (which includes some allowance for drying, wastage and rejection of stones where required) by the number of test determinations to be carried out. Where the total mass of sample so calculated is less than the minimum mass given below for the appropriate soil group, then that minimum mass should be taken to ensure the sample is representative:

<u>Soil Grouping</u>	<u>Minimum Mass</u>
fine-grained soils	0.5 kg
medium-grained soils	5 kg
coarse-grained soils	30 kg

**APPENDIX 4**

**GI Site Supervisory Personnel Information and Declaration on Conflict of Interest  
(EXAMPLE)**

Project: \_\_\_\_\_  
\_\_\_\_\_

GEO Ground Investigation Task Order No: \_\_\_\_\_

The undersigned will undertake the site supervision of the captioned GI service. The undersigned are fully conversant with the requirements of the project, the standard of workmanship required, the contract Specification of the GEO term contract under which the service are carried out and the procedures in GEO GI Note No. 1/2022 or its update version. Our duties include but are not limited to the supervision of drilling, sampling, coring, field testing, instrument installation and backfilling; verification of the final depths of inspection pits, trial pits/trenches and drillholes; verification of reinstatement, site cleaning and tidying, handover of the site; and general inspection of the equipment used prior to these service. We will establish effective communication with our project office and the GEO for the GI service. The undersigned confirm that the full-time site supervisor will be full time on site/Affected Property during the fieldwork period of the above works task order and, in case the full-time site supervisor is not available, appropriate replacement as agreed by GEO will be arranged immediately.

The undersigned also declare that the content of ETWB TC(W) No. 18/2005 is noted and there is no conflict or potential conflict of interest with the GI term contractor.

Full-time (Technical) Supervisor : Signed : \_\_\_\_\_

Name : \_\_\_\_\_

Post : \_\_\_\_\_

Date : \_\_\_\_\_

Consultant Firm / Department : \_\_\_\_\_

Part-time (Professional) Supervisor : Signed : \_\_\_\_\_

Name : \_\_\_\_\_

Post : \_\_\_\_\_

Date : \_\_\_\_\_

Consultant Firm / Department : \_\_\_\_\_