

1. COMMON CORE OBJECTIVES	Code	ES initials and Date of Assessment			
		C	E	K	G
<p>(c) Inherent responsibilities for a professional engineer/geologist in relation to :</p> <p>(i) Ethics (ii) Codes of behaviour (iii) Professionalism</p>	K				
<p>1.3 GENERAL PERSONAL DEVELOPMENT</p>					
<p>(a) Keeping updated on local, regional and international current affairs in :</p> <p>(i) Geotechnical engineering and engineering geology by reading relevant local, regional and international publications such as 'Asia Engineer'. (ii) Current affairs both locally/regionally and internationally by reading, at least a quality local and national newspaper.</p>	K				
<p>(b) Involvement with other local learned societies such as the Geological Society of Hong Kong.</p>	G				
<p>(c) Record of Continuing Professional Development (CPD) attendance in CPD Log Book and satisfying the ES/CTG as to the value of each activity attended.</p>	C				
<p>1.4 PERSONAL QUALITIES</p> <p>Demonstrating personal activities with respect to:</p> <ul style="list-style-type: none"> - Technical Competence - Creativity - Innovative Abilities - Professional & Social Confidence 	C				

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1.5 OCCUPATIONAL SAFETY & HEALTH (S&H) (a) Relevant S&H Legislation (b) S&H Responsibilities of Professional Engineers to : (i) Employers (ii) Employees (iii) General Public (c) S&H related to geotechnical works	 K K C				
1.6 ENVIRONMENT (a) Be familiar with the provisions of the Environmental Impact Assessment Ordinance as it relates to the construction industry (b) Inter-relationship of technology with the environment in :- (i) The work place (ii) Society generally	 K C K				
1.7 COMMUNICATION Be able to communicate confidently and accurately in the professional manner required:- (i) Orally - Informally at discussion - Formally at presentations - At meetings (ii) Written - Reports - Memos - Instructions to junior staff - Letters - Bibliography	 C				

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<p>1.8 OWN ORGANISATION</p> <p>Know the structure of the Geotechnical Engineering Office with respect to :-</p> <ul style="list-style-type: none"> - Size and History - Relationships with Government Departments and other organisations - Management Structure and Functions - Office Manuals, Procedures and Practices - Communications Systems - Training Programmes and Career Development Paths 	C				

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<p>2.1 GEOTECHNICAL ENGINEERING DESIGN PRACTICE</p> <p>(a) Have a working knowledge of HKSAR Government design manuals, codes of practice and British Standards in regular use in GEO, especially :</p> <p>(i) GEO publications including Geoguides and Geospecs, (ii) Geological Maps and Memoirs published by Hong Kong Geological Survey, (iii) GEO Technical Circulars.</p> <p>(b) Have a working knowledge of computer programs in regular use in GEO.</p> <p>(c) Be familiar with sources of information in HKSAR (See Geoguide 2, Appendix B)</p>	<p>K</p> <p>E</p> <p>E</p>				
<p>2.2 DEFINING A PROBLEM</p> <p>Have experience in identifying and defining a problem accurately.</p> <p>Take an active part, probably in a supporting role, in researching, assembling and assessing basic data.</p>	E				
<p>2.3 ALTERNATIVE SOLUTIONS</p> <p>Gain practical experience in the identification and evaluation of alternative solutions to a problem.</p> <p>Assist in the technical and financial evaluation of alternatives by, for example, assisting with a feasibility study covering such aspects as : concepts and precedents, sources of information, estimates and budget quotations, quick design methods, writing, production and interpretation of feasibility reports, and briefs for detailed design, etc.</p>	E				

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<p>2.4 APPLY STANDARDS</p> <p>Know the application and limitations of national and international standards, codes of practice, technical memoranda, etc.</p> <p>List the documents you have used</p>	K				
<p>2.5 DESIGNING A SOLUTION</p> <p>Produce the solution to a problem</p> <p>Draw together all the relevant data and analytical work under 2.1, 2.2 and 2.3 appropriate to engineering geology and geotechnical engineering.</p>	E				
<p>2.6 DRAWINGS</p> <p>Present the solution to a problem.</p> <p>Produce documentation on the solution containing diagrams, sketches, charts etc. and/or produce general arrangement and detailed drawings using scales and drawing sizes appropriate to the information to be conveyed.</p>	E				
<p>2.7 THE ENVIRONMENT</p> <p>Appreciate the way a report on environmental issues is used in arriving at an engineering solution.</p> <p>Understand the relevance of an environmental impact assessment as it affects the solution of a problem within GEO.</p>	G				

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<p>2.8 SPECIFICATIONS</p> <p>Appreciate the way technical specifications are an essential part of the solution of a problem.</p> <p>Select or write a specification and/or amend an existing specification for a particular item or work.</p>	G				
<p>2.9 PROJECT COSTING</p> <p>Have experience of costing the solutions to problems by taking off quantities and building up cost estimates.</p> <p>Present examples for discussion and comment.</p>	E				
<p>2.10 SAFETY IN DESIGN</p> <p>Know the requirements for safety in problem solving by being familiar with the regulations applying to your work.</p> <p>State regulations used and safety criteria followed</p>	K				
<p>2.11 THE CONTRACT & ITS OPERATION</p> <p>(a) Know how all parties to a contract exercise their duties and responsibilities by appreciating the practical application of the various documents forming a particular contract.</p> <p>(b) Know the procedure for the issue and/or receipt, registration and filing of work instructions and/or drawings and amendments.</p> <p>(c) Be able to keep an accurate daily record of events and instructions.</p> <p>(d) Read and co-ordinate drawings and/or implement work instructions by being involved on a day-to-day basis in this process.</p>	K K C C				

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<p>2.12 SETTING OUT</p> <p>Participate in the dimensional control and accuracy of the work you are implementing.</p> <p>Demonstrate competence by the quality of your work.</p>	C				
<p>2.13 METHODS AND PLANT</p> <p>Know the use, performance and cost of equipment and/or plant used in implementing a solution.</p> <p>Include in Log Book all major items of which you have first-hand experience.</p>	K				
<p>2.14 PLANNING AND PROGRAMMING</p> <p>Participate in planning, programming, and monitoring work progress and reporting.</p> <p>Discuss programme with your TT.</p>	C				
<p>2.15 MEASUREMENT</p> <p>Be able to measure and record or independently check work done for payment purposes.</p> <p>Take part in this work for the preparation or checking of interim valuations and/or final accounts.</p>	C				

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<p>2.16 SAFETY AT WORK</p> <p>Have a critical approach to safety matters in the implementation process and to the observance of safe working practices.</p> <p>Know your responsibilities relating to safety and be familiar with legislation relating to your particular work.</p> <p>Appreciate good safety practices relevant to your work by reference to the Government's Construction Site Safety Manual.</p>	E				
<p>2.17 QUALITY CONTROL AND QUALITY ASSURANCE</p> <p>Know the principles of quality control to meet a specification.</p> <p>Record your involvement with quality control and any involvement with quality assurance.</p>	K				
<p>2.18 PROCEDURAL</p> <p>(a) Have experience in the procedures to be followed for including projects in the Public Works Programme.</p> <p>(b) Know the procedures involved in calling for tenders and assessing tenders.</p> <p>(c) Know the procedures for land acquisition.</p> <p>(d) Have a working knowledge of relevant ordinances containing geotechnical provisions (e.g. Buildings Ordinance).</p>	G K K K				
<p>2.19 TECHNICAL</p> <p>(a) Be able to produce working drawings and have knowledge of correlating drawings with technical specifications.</p> <p>(b) Have experience in applying the Conditions of Contract.</p>	C E				

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<p>2.20 FINANCIAL</p> <p>(a) Appreciate how departments' budgets are computed and controlled.</p> <p>(b) Appreciate the operation of cost indices.</p> <p>(c) Understand the financial authorities and financial limits of officers in Government departments.</p>	G				
<p>2.21 CONTRACTUAL</p> <p>Have some knowledge of the relative merits of implementing construction works by use of :</p> <p>(i) Lump Sum contracts,</p> <p>(ii) Remeasurement contracts, and</p> <p>(iii) Schedule of Rates contracts.</p>	K				

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3.1 TERRAIN EVALUATION & AERIAL PHOTOGRAPH INTERPRETATION (API)					
(a) Understand the basic principles and limitations of terrain evaluation methods.	K				
(b) Have a thorough knowledge of terrain classification mapping.	E				
(c) Know how to apply aerial photograph interpretation to engineering problems, including: (i) routine API, and (ii) API in a major landslide study.	E				
(d) Understand the use of API and terrain evaluation concepts in the GEO's Geotechnical Area Studies Programme (GASP) and Natural Terrain Landslide Study (NTLS), and the Geographic Information Systems (GIS) products from these studies	K				
(e) Have a working knowledge of GEO's slope identification and registration system, and the technical content of the Slope Information System (SIS) database and its GIS products	K				
3.2 GEOLOGICAL SURVEY					
(a) Know how to carry out geological field mapping at the regional scale.	C				
(b) Be able to use and interpret other methods of geological surveying/problem solving (e.g. geophysical, geochemical methods)	E				
(c) Know how to use and interpret aerial photographs for geological mapping.	C				
(d) Be able to identify and classify soils and rocks.	C				
(e) Have a working knowledge of petrology and petrography and sedimentology (including use of palaeontology for dating)	C				

<p>(f) Know how to interpret and describe a field area and produce cross-sections, reports, geological maps, etc.</p>	C				
<p>(g) Have an understanding of the GEO's Geoscience Database and its GIS products</p>	K				
<p>3.3 ENGINEERING GEOLOGY</p>	K				
<p>(a) Understand the principles and know how to interpret engineering geology maps at regional, district and local/site scale.</p>	C				
<p>(b) Be able to describe and classify soil and rock materials and masses for engineering use.</p>	K				
<p>(c) Understand the material and mass behaviour and the engineering properties of common rock and soil types in Hong Kong.</p>	E				
<p>(d) Be capable of assessing and improving the stability of a rock slope, including discontinuity data collection, kinematic analysis (including use of appropriate computer software) and design of improvement or remedial works.</p>	E				
<p>(e) Know how to apply and interpret shallow engineering geophysical methods (e.g. seismic refraction and reflection, ground penetrating radar, resistivity imaging, spectral analysis of surface waves and electromagnetic methods).</p>	E				
<p>(f) Know how to evaluate the stability of, and support requirements for, rock tunnels and caverns by rock mass classification systems (e.g. Q-Index, and RMR method).</p>	E				
<p>(g) Have experience in carrying out engineering geological field studies of major landslides.</p>					
<p>3.4 HYDROGEOLOGY</p>	K				
<p>(a) Understand and have some familiarity with the occurrence of groundwater, hydraulic boundary conditions, flow systems and hydrogeological parameters.</p>					

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(b) Understand the theory and principles of groundwater hydraulics and be able to assess the effect of groundwater on slope stability, including its representation in computer software based on limit equilibrium analytical techniques.	E				
(c) Understand the effect of engineering work on a groundwater regime and the physical and environmental changes this can produce.	K				
(d) Be able to analyse groundwater flow systems by use of flownets and mathematical modelling.	E				
3.5 CONSTRUCTION MATERIAL RESOURCES					
(a) Know how to evaluate natural construction material reserves and layout working areas.	K				
(b) Understand the methods of exploration, methods of working (blasting, loading, transport, etc.) and processing (crushing, screening, refining) of geological materials for construction use.	K				
(c) Know how to evaluate the suitability of geological materials for construction by laboratory testing.	E				
(d) Be able to evaluate the stability of working faces and waste disposal areas.					
3.6 GROUND INVESTIGATION AND LABORATORY TESTING					
(a) Understand the capabilities of different ground investigation techniques and equipment.	E				
(b) Be capable of carrying out technical supervision of ground investigation including land and marine-based drilling and boring, land and marine-based geophysics, trial pitting, slope stripping, sampling, insitu testing and piezometer installation.	E				

<p>(c) Be proficient in assessing laboratory testing requirements for soils and rocks and assessing test data to derive design parameters.</p>	E				
<p>(d) Be familiar with soil and rock laboratory testing standards and practice including sample description, sample preparation, testing techniques and reporting.</p>	E				
<p>3.7 GEOTECHNICAL ENGINEERING DESIGN</p>	E				
<p>(a) Be capable of conducting a desk study for a site investigation.</p>	E				
<p>(b) Be competent in the design of ground investigation for different types of geotechnical work (e.g. slope stability, foundations, borrow areas).</p>	E				
<p>(c) Know how to evaluate the stability of fill slopes, cut slopes, and retaining walls, and be familiar with computer software based on common limit equilibrium analytical techniques.</p>	E				
<p>(d) Be familiar with the range of measures used to improve the stability of existing slopes and retaining walls and to create stable new slopes and walls, including the use of geosynthetic products (e.g. for reinforcement, or in filters)</p>	K				
<p>(e) Know how to design common slope stabilization, improvement or remedial measures.</p>	K				
<p>3.8 CONSTRUCTION SITE EXPERIENCE</p>	E				
<p>(a) Be capable of supervising the construction of temporary and permanent geotechnical works such as :</p> <ul style="list-style-type: none"> (i) site formation, including slopes (cut and fill), and retaining walls, (ii) foundations and deep excavations, (iii) tunnels and rock caverns, and (iv) site drainage. 	E				

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(b) Have knowledge of the efficient and economical use of mechanical plant commonly used in the execution of geotechnical works.	K				
(c) Understand the principles of concrete production and quality control of the end product and constituent materials.	K				