THE HONG KONG INSTITUTION OF ENGINEERS
SCHEME "A" GRADUATE TRAINING
CONSOLIDATED MODEL TRAINING GUIDE
CIVIL ENGINEERING

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	1. Introduction			**1**
	1.1 Information about the Company			
Location 1	***Description 1***			
	1.1.1 Own Organisation			
	a) Discuss the size, history and internal culture of the trainee's own organisation.	*CCO 1.10*	11	
	b) Discuss an overview of the relationship between the trainee's own organisation, government departments and other organisations.	*CCO 1.10*	11	
	c) Discuss the structure and functions of different units within the trainee's own organisation.	*CCO 1.10*	11	
	d) Demonstrate the awareness to follow operational procedures and practices as required by the trainee's own organisation.	*CCO 1.10*	11	
	e) Discuss the objectives, requirements and processes that support the quality assurance system within the trainee's own organisation.	*CCO 1.10*	11	
	f) Apply the quality assurance system according to the policy of the trainee's own organisation.	*CCO 1.10*	11	
	g) Apply quality assurance tools and procedures in work.	*CO 3.10*	6	
	1.1.2 Training Programme, Prospects and Career Development			
	a) Discuss an overview of the internal communication systems, training system and career development pathway within the trainee's own organisation.	*CCO 1.10*	11	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	b) Demonstrate a commitment to extend and develop up-to-date technical knowledge through reading relevant engineering publications, participating in seminars or conferences, and information searching.	*CCO 1.2*	11	
	c) Demonstrate a commitment to extend and develop up-to-date knowledge of local, regional and international current affairs through reading relevant engineering publications, participating in seminars or conferences, and information searching.	*CCO 1.3*	11	
	d) Demonstrate a commitment to participate in the local organisations or community services for general personal development.	*CCO 1.3*	11	
	1.2 Information about the HKIE			
Location 2	***Description 2***			
	a) Discuss an overview of the HKIE organisation as well as its history and role in society.	*CCO 1.1*	11	
	b) Demonstrate a commitment to participate in relevant activities organised by the HKIE.	*CCO 1.1*	11	
	2. Engineer as a Profession			**Conti-nuous**
	2.1 Professionalism			
Location 3	***Description 3***			
	a) Discuss the social and ethical responsibilities of engineers in society.	*CCO 1.2*	8	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	b) Explain the rules and standard requirements of conducting engineering activities to the HKIE, employers, clients, general public and colleagues in accordance with the HKIE Rules of Conduct.	*CCO 1.2*	8	
	c) Explain the ethical standards and responsibilities of professional engineers as required by the HKIE.	*CCO 1.2*	8	
	d) Demonstrate the awareness to follow the codes of practice of professional engineers.	*CCO 1.2*	8	
	e) Demonstrate the awareness to uphold the dignity, standing and reputation of the engineering profession.	*CCO 1.2*	8	
	f) Demonstrate the awareness to protect the interests of the community including the environment, welfare, health and safety in conducting engineering activities.	*CCO 1.2*	8	
	2.2 Environment			
Location 4	***Description 4***			
	a) Demonstrate an understanding of the relevant statutory environmental requirements related to the trainee's discipline.	*CCO 1.6*	9	
	b) Evaluate the inter-relationship of technology with the environment in the work place.	*CCO 1.6*	9	
	c) Demonstrate the awareness of the impact of technology on the environment in society.	*CCO 1.6*	9	

THE HONG KONG INSTITUTION OF ENGINEERS
SCHEME "A" GRADUATE TRAINING
CONSOLIDATED MODEL TRAINING GUIDE
CIVIL ENGINEERING

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	3. Design and Associated Office Practice			**52**
	Trainee should have a total of at least twelve months of full-time training and experience in design office.			
	3.1 Civil engineering design of permanent and/or temporary works.			26
Location 5	***Description 5***			
	a) Apply local and / or international Standards, Codes of Practice, Technical Memoranda etc. in producing engineering solutions.	*CO 2.1*	2	
	b) Compile all the relevant data and analytical work appropriate to your sector of industry.	*CO 2.2*	4	
	c) Justify the selection of design approach by identifying the major factors on which the solution depends for accuracy or completeness.	*CO 2.2*	12	
	3.2 Designing an Engineering Solution.			26
Location 6	***Description 6***			
	a) Produce an engineering solution.	*CO 2.2*	12	
	b) Produce adequate documentation on the solution containing diagrams, sketches, charts etc., and/or	*CO 2.3*	10	
	c) Produce adequate general arrangement and detailed drawings using scales and drawing sizes appropriate to the information to be conveyed.	*CO 2.3*	10	
	4. Site Experience			**52**
	Trainee should have a total of at least twelve months of full-time training and experience on site.			
	4.1 Planning and programming of construction.			8
Location 7	***Description 7***			
	(a) Develop project planning and programming.	*CO 3.7*	4	
	(b) Plan necessary schedule amendment by critically assessing the project progress.	*CO 3.7*	5	
	(c) Produce project progress reports.	*CO 3.7*	10	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	4.2 Methods of Construction, including dimensional control.			28
Location 8	***Description 8***			
	(a) Appraise engineering drawings, specifications, and other contract documents.	*CO 3.4*	6	
	(b) Take a leading role or supporting role to carry out work according to contract documents and instructions.	*CO 3.4*	6	
	(c) Appraise dimensional control and accuracy during the work implementation process.	*CO 3.5*	1	
	4.3 Site records and reports.			8
Location 9	***Description 9***			
	(a) Apply procedure to keep record for the issue and/or receipt, registration and filing of work instructions and/or drawings and amendments.	*CO 3.2*	6	
	(b) Produce accurate daily records of events and instructions.	*CO 3.3*	6	
	4.4 Measurement of works, interim statements and certificates, valuation of variations including variation orders.			8
Location 10	***Description 10***			
	(a) Assess project work done for payment purposes.	*CO 3.8*	6	
	(b) Prepare documentations of interim valuations and/or Final Accounts, OR	*CO 3.8*	6	
	(c) Assess interim valuations and/or Final Accounts and make correction if necessary.	*CO 3.8*	6	
	5. Other General Training (which may be applicable to office experience or site experience)			**51**
	This section of training may be carried out in office or on site.			
	5.1 Defining a Problem and Alternative Solutions			31
Location 11	***Description 11***			
	a) Demonstrate a general understanding of overall civil engineering procedures.	*CO 1.1*	1	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	b) Support the research, assembling, and assessing of basic data.	*CO 1.2*	3	
	c) Carry out thinking / analytical process to define a problem.	*CO 1.2*	3	
	d) Produce Quarterly Reports to show involvement in identifying and defining a problem.	*CO 1.2*	10	
	e) Support the evaluation of alternative solutions from various technical perspectives such as concepts and precedents, sources of information, budget estimates and quotations, quick design methods and briefs for detailed design etc.	*CO 1.3*	3	
	f) Support the evaluation of alternative solutions from various financial perspectives such as concepts and precedents, sources of information, budget estimates and quotations, quick design methods and briefs for detailed design etc.	*CO 1.3*	3	
	g) Develop implementation plan of the selected alternative.	*CO 1.3*	4	
	h) Develop briefs for detailed design of the selected alternative.	*CO 1.3*	4	
	5.2 Materials including their cost, storage and handling problems, testing, quality and other characteristics; methods of construction			4
Location 12	***Description 12***			
	a) Examine various requirements affecting the construction method and technical specifications relevant to the design of solution.	*CO 2.5*	3	
	b) Develop design or construction method to comply with the technical specifications for a particular item of work.	*CO 2.5*	10	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	5.3 Statutory requirements, laws and ordinances affecting project implementation relating to site safety and environment.			4
Location 13	***Description 13***			
	(a) Diagnose safety risks at work.	*CO 3.9*	7	
	(b) Develop safe working practices.	*CO 3.9*	4	
	(c) Comply with safety requirements and regulations in the engineering solution.	*CO 2.7*	2	
	(d) Demonstrate an understanding of the statutory health and safety requirements.	*CCO 1.5*	9	
	(e) Demonstrate an understanding of the responsibilities of professional engineers for the health and safety of the employers, employees and general public when engaging in engineering activities.	*CCO 1.5*	9	
	(f) Apply the safety management system in accordance with the industry standards and regulatory requirements.	*CCO 1.5*	7	
	(g) Demonstrate an understanding of environmental issues in arriving at an engineering solution.	*CO 2.4*	9	
	(h) Explain the impacts of environmental issues to an engineering solution.	*CO 2.4*	9	
	5.4 Mechanical plant including knowledge of use, capacity, output and cost.			4
Location 14	***Description 14***			
	(a) Examine the use, performance and cost of equipment and / or plant used in implementing a solution.	*CO 3.6*	3	
	(b) Produce Quarterly Reports to demonstrate the first-hand knowledge possessed.	*CO 3.6*	10	
	5.5 Estimating costs, taking off quantities and preparation of bills of quantities to standard methods of measurement.			4
Location 15	***Description 15***			
	(a) Produce project costing by taking off quantities and building up cost estimates.	*CO 2.6*	6	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	5.6 Knowledge of conditions of contract and specifications.			4
Location 16	***Description 16***			
	(a) Examine the duties and responsibilities of all parties in a contract by appreciating the practical application of the various documents forming a particular contract.	*CO 3.1*	6	
	6. Other Common Core Outcomes for Continuous Development			**Conti-nuous**
	6.1 Staff relationship, human resource planning, motivation and enforcement.			
Location 17	***Description 17***			
	(a) Demonstrate the awareness of the duties and employment criteria for different job positions in an engineering project.	*CCO 1.8*	6	
	(b) Demonstrate an understanding of the relevant legal requirements and regulatory issues of labour employment and management.	*CCO 1.8*	6	
	(c) Discuss the appropriate staff training and development programmes in the organisation.	*CCO 1.8*	6	
	6.2 Report writing and presentation.			
Location 18	***Description 18***			
	(a) Communicate ideas orally in an accurate and clear manner under various situations (including presentations and meetings).	*CCO 1.7*	10	
	(b) Formulate an oral presentation of complicated data and information in an effective and persuasive manner.	*CCO 1.7*	10	
	(c) Produce grammatically correct, clear and concise documents (including memos, letters, instructions, reports, resumes and technical papers) which meet the business objectives.	*CCO 1.7*	10	
	(d) Evaluate the needs of the intended readers to design appropriate technical contents for communication.	*CCO 1.7*	10	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	6.3 Technical and Commercial Leadership			
Location 19	***Description 19***			
	(a) Discuss the various leadership qualities required of a leader including accountability, conflict management and resources management etc.	*CCO 1.9*	6	
	(b) Explain the importance of accountability and responsibility required by a leader for making decisions on engineering activities.	*CCO 1.9*	6	
	(c) Apply various management skills in engineering projects.	*CCO 1.9*	6	
	(d) Distinguish the relationship between good leadership and good management skills.	*CCO 1.9*	6	
	(e) Demonstrate an understanding of the importance of teamwork and partnering skills in engineering projects.	*CCO 1.9*	6	
	6.4 Development of Personal Qualities			
Location 20	***Description 20***			
	(a) Identify appropriate innovative approach and/or tools for professional development.	*CCO 1.4*	11	
	(b) Demonstrate interpersonal skills for professional development.	*CCO 1.4*	10	
	(c) Demonstrate negotiating skills required for various engineering activities.	*CCO 1.4*	10	
	(d) Demonstrate sound time management skills for professional development.	*CCO 1.4*	11	
	(e) Demonstrate a commitment to continuous development and enhancement.	*CCO 1.4*	11	
	6.5 Business Operations			
Location 21	***Description 21***			
	(a) Recognise the importance of intellectual property to business operations.	*CCO 1.11*	11	
	(b) Describe the legal requirements in Hong Kong relevant to intellectual property rights.	*CCO 1.11*	11	
	(c) Identify appropriate tools and method to measure and improve the productivity of business operations.	*CCO 1.11*	11	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	(d) Identify appropriate information technology applications to manage business information and to facilitate business operations.	*CCO 1.11*	11	
	(e) Recognise the importance of research and development towards business operations.	*CCO 1.11*	11	
	(f) Demonstrate the awareness of financial considerations in operation business.	*CCO 1.11*	11	
	(g) Recognise the importance of business development in business operations.	*CCO 1.11*	11	

N.B.

1. The training period must not be less than 156 weeks (36 months).
2. The programme set out is for guidance only but substantial departure should not be made. Employers should endeavour to provide training to their trainees in as many areas as possible as is appropriate to the sector of employment.
3. For training in Civil Engineering Discipline there are requirements for minimum total periods of training both on site and in office. However many of the modules to be covered are applicable to either or both of these situations and cannot be separated. The indicated training period is a recommendation only and subject to point 4 below, companies may adjust the times to suit their own circumstance.
4. For Section 2 (Office) and Section 3 (Site), it is expected (though not essential) that each of the minimum twelve months duration will be spent by the trainee in one continuous engagement. This would enable the trainee to take up some responsibilities and gain knowledge of as many aspects of civil engineering as possible associated with one working environment.
5. This guide should be read in conjunction with Section 3 of the M3 Routes to Membership.
6. During the training, each trainee is required to a Graduate Training Log Book, Record of Continuing Professional Development and Record of Training Outcomes.