

THE HONG KONG INSTITUTION OF ENGINEERS
CONSOLIDATED MODEL TRAINING GUIDE
FOR FORMAL TRAINING SCHEME TO ASSOCIATE MEMBERSHIP
CIVIL ENGINEERING

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Competence Ref. (Associate Members)	Length of Time (weeks)
	1. Introduction			1
	1.1 Information about the Company			
<i>Location 1</i>	<i>Description 1</i>			
	1.1.1 Own Organisation			
	a) Discuss the size, history and internal culture of the trainee's own organisation.	CCO(AM) 1.2(a)	11	
	b) Discuss an overview of the relationship between the trainee's own organisation, government departments and other organisations.	CCO(AM) 1.2(b)	11	
	c) Discuss the structure and functions of different units within the trainee's own organisation.	CCO(AM) 1.2(c)	11	
	d) Demonstrate the awareness to follow operational procedures and practices as required by the trainee's own organization.	New CCO	11	
	e) Discuss the objectives, requirements and processes that support the quality assurance system within the trainee's own organisation.	CCO(AM) 1.7(b)	11	
	f) Apply the quality assurance system according to the policy of the trainee's own organisation.	CCO(AM) 1.7(b)	11	
	g) Appraise quality assurance tools and procedures in work.	CO(AM) 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 organization.	New CCO	11	
	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(AM) 1.3(d)	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(AM) 1.6(a)	11	
	d) Demonstrate a commitment to participate in the local organisations or community services for general personal development.	CCO(AM) 1.6(b)	11	
	1.2 Information about the HKIE			
<i>Location 2</i>	<i>Description 2</i>			
	a) Discuss an overview of the HKIE organisation as well as its history and role in society.	CCO(AM) 1.1(a)	11	
	b) Demonstrate a commitment to participate in relevant activities organised by the HKIE.	CCO(AM) 1.1(b)	11	

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	2. Professionalism			Continuous
	2.1 Conduct and Responsibilities			
Location 3	Description 3			
	a) Discuss the social and ethical responsibilities expected in the society.	CCO(AM) 1.3(a), (c)	8	
	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(AM) 1.3(b)	8	
	c) Explain the ethical standards and responsibilities required by the HKIE.	CCO(AM) 1.3(c)	8	
	d) Demonstrate the awareness to follow the codes of practice required by the industry.	CCO(AM) 1.3(c)	8	
	e) Demonstrate the awareness to uphold the dignity, standing and reputation of the engineering profession.	New CCO	8	
	f) Demonstrate the awareness to protect the interests of the community including the environment, welfare, health and safety in conducting engineering activities.	New CCO	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(AM) 1.4(a)	9	
	b) Demonstrate the awareness of the inter-relationship of technology with the environment in the work place.	CCO(AM) 1.4(b)	9	
	c) Demonstrate the awareness of the impact of technology on the environment in society.	CCO(AM) 1.4(c)	9	
	d) Explain the development, implementation and audit of environmental plan and waste management plan for energy saving, conservation or minimizing environmental nuisance.	CO(AM) 3.11	2	
	3. Design and Associated Office Practice			26
	<i>Trainee should have a total of at least six months of full-time training and experience in design office.</i>			
	3.1 Civil engineering design of permanent and/or temporary works			
Location 5	Description 5			
	a) Explain the local and / or international Standards, Codes of Practice, Technical Memoranda etc. in producing engineering solutions.	CO(AM) 2.1	2	
	b) Analyse the selection of design approach by identifying the major factors on which the solution depends for accuracy or completeness.	CO(AM) 2.2	12	
	3.2 Designing an Engineering Solution			
Location 6	Description 6			
	a) Carry out procedures to produce an engineering solution.	CO(AM) 2.2	12	
	b) Apply appropriate software to produce a design drawing (including Building Information Modeling (BIM)) and calculation for the engineering problem.	CO(AM) 2.3	4	

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	c) Produce adequate documentation on the solution containing diagrams, sketches, charts etc.	CO(AM) 2.4	10	
	4. Site Experience			52
	<i>Trainee should have a total of at least twelve months of full-time training and experience on site.</i>			
	4.1 Planning and programming of construction			8
Location 7	Description 7			
	a) Carry out procedures to develop project planning and programming.	CO(AM) 3.7	4	
	b) Carry out procedures to plan necessary schedule amendment by critically assessing the project progress.	CO(AM) 3.7	5	
	c) Produce project progress reports.	CO(AM) 3.7	10	
	4.2 Methods of Construction, including dimensional control			28
Location 8	Description 8			
	a) Appraise dimensional control and accuracy during the work implementation process.	CO(AM) 3.4	1	
	b) Examine the principle of engineering survey.	CO(AM) 3.5	1	
	4.3 Site records and reports			8
Location 9	Description 9			
	a) Produce accurate daily records of events and instructions.	CO(AM) 3.2	6	
	4.4 Measurement of works, interim statements and certificates, valuation of variations including variation orders			8
Location 10	Description 10			
	a) Examine project work done for payment purposes.	CO(AM) 3.8	6	
	5. Other General Training (which may be applicable to office experience or site experience)			25
	<i>This section of training may be carried out in office or on site.</i>			
	5.1 Defining a Problem and Alternative Solutions			
Location 11	Description 11			
	a) Demonstrate a general understanding of overall civil engineering principles and civil engineering procedures.	CO(AM) 1.1	1	
	b) Develop process to define the client requirement and to identify external restraints.	CO(AM) 1.2	4	
	c) Assess the possible solutions to problems.	CO(AM) 1.2	7	
	5.2 Materials including their cost, storage and handling problems, testing, quality and other characteristics; methods of construction			
Location 12	Description 12			
	a) Analyze various requirements affecting the construction method and technical specifications relevant to the design of solution.	CO(AM) 2.6	3	
	b) Develop design or construction method to comply with the technical specifications for a particular item of work.	CO(AM) 2.6	10	
	5.3 Statutory requirements, laws and ordinances affecting project implementation relating to site safety and environment			
Location 13	Description 13			
	a) Analyze safety risks at work.	CO(AM) 3.9	7	
	b) Carry out safe working practices.	CO(AM) 3.9	4	
	c) Discuss the safety requirements and regulations in the engineering solution.	CO(AM) 2.8	2	

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	d) Demonstrate an understanding of the statutory health and safety requirements.	<i>CCO(AM) 1.4(a)</i>	9	
	e) Demonstrate an understanding of the responsibilities of for the health and safety of the employers, employees and general public when engaging in engineering activities.	<i>CCO(AM) 1.4(b)</i>	9	
	f) Plan the operation of safety management system in accordance with the industry standards and regulatory requirements.	<i>CCO(AM) 1.4(c)</i>	7	
	g) Demonstrate an understanding of environmental issues in arriving at an engineering solution.	<i>CO(AM) 2.5</i>	9	
	h) Explain the impacts of environmental protection issues to an engineering solution.	<i>CO(AM) 2.5</i>	9	
	5.4 Mechanical plant including knowledge of use, capacity, output and cost			
Location 14	Description 14			
	a) Examine the use, performance and cost of equipment used in implementing a solution.	<i>CO(AM) 3.6</i>	3	
	b) Produce Quarterly Reports to demonstrate the first-hand knowledge possessed.	<i>CO(AM) 3.6</i>	10	
	5.5 Estimating costs, taking off quantities and preparation of bills of quantities to standard methods of measurement			
Location 15	Description 15			
	a) Produce project costing by taking off quantities and building up cost estimates.	<i>CO(AM) 2.7</i>	6	
	5.6 Knowledge of conditions of contract and specifications			
Location 16	Description 16			
	a) Explain the duties and responsibilities of all parties in a contract by appreciating the practical application of the various documents forming a particular contract.	<i>CO(AM) 3.1</i>	6	
	5.7 Technology in Specialized Area			
	<i>(optional: Trainee should have in depth experience of technology application in either Design Activities, Construction Activities or Project Management)</i>			
Location 17	Description 17			
	a) Apply appropriate technology to conduct design activities with one of the following streams: <ul style="list-style-type: none"> ▪ Earth and ground engineering works ▪ Building or structural works ▪ Marine engineering works ▪ Roads and drainage works ▪ Water supply works ▪ Municipal works ▪ Others as proposed by the employer OR	<i>CO(AM) 4.1</i>	2	
	b) Apply appropriate technology to conduct construction activities with one of the following streams: <ul style="list-style-type: none"> ▪ Earth and ground engineering works ▪ Building or structural works ▪ Marine engineering works ▪ Roads and drainage works 	<i>CO(AM) 4.2</i>	2	

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	<ul style="list-style-type: none"> ▪ Water supply works ▪ Municipal works ▪ Others as proposed by the employer <p>OR</p> <p>c) Apply appropriate technology on project management (trainee should have project management experience in the following)</p> <ul style="list-style-type: none"> ▪ Design ▪ Selection of materials ▪ Tendering ▪ Budget planning ▪ Works programme preparation ▪ Progress monitoring ▪ Legal and contractual aspect of the project ▪ Management skill 	CO(AM) 4.3	2	
	6. Other Common Core Outcomes for Continuous Development			Contin-uous
	6.1 Staff relationship, human resource planning, motivation and enforcement			
Location 18	Description 18			
	a) Demonstrate the awareness of the duties and employment criteria for different job positions in an engineering project.	CCO(AM) 1.8(a)	6	
	b) Demonstrate an understanding of the relevant legal requirements and regulatory issues of labour employment and management.	CCO(AM) 1.8(b)	6	
	c) Identify the appropriate staff training and development programmes in the organisation.	CCO(AM) 1.8(c)	6	
	6.2 Report writing and presentation			
Location 19	Description 19			
	a) Communicate ideas orally in an accurate and clear manner under various situations (including presentations and meetings).	CCO(AM) 1.11(a), (c)	10	
	b) Formulate an oral presentation of complicated data and information in an effective and persuasive manner.	CCO(AM) 1.11(a)	10	
	c) Produce grammatically correct, clear and concise documents (including memos, letters, instructions, reports and resumes) which meet the business objectives.	CCO(AM) 1.11(b)	10	
	d) Evaluate the needs of the intended readers to design appropriate technical contents for communication.	CCO(AM) 1.11(b)	10	
	6.3 Technical and Commercial Leadership			
Location 20	Description 20			
	a) Discuss the various leadership qualities required of a leader including accountability, conflict management and resources management etc.	CCO(AM) 1.12(a)	6	
	b) Explain the importance of accountability and responsibility required by a leader for making decisions on engineering activities.	CCO(AM) 1.12(a)	6	
	c) Apply various management skills in engineering projects.	CCO(AM) 1.12(b)	6	

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	d) Distinguish the relationship between good leadership and good management skills. e) Demonstrate an understanding of the importance of teamwork, partnering and supervision skills in engineering projects.	CCO(AM) 1.12(c) CCO(AM) 1.12(d)	6 6	
Location 21	6.4 Development of Personal Qualities Description 21			
	a) Identify appropriate innovative approach and/or tools for professional development. b) Demonstrate interpersonal skills for professional development. c) Demonstrate negotiating skills required for various engineering activities. d) Demonstrate sound time management skills for professional development. e) Demonstrate a commitment to continuous development and enhancement.	CCO(AM) 1.10(a) CCO(AM) 1.10(b) CCO(AM) 1.11-(d) New CCO New CCO	11 10 10 11 11	
	6.5 Business Operations			
Location 22	Description 22			
	a) Recognise the importance of intellectual property to business operations. b) Describe the legal requirements in Hong Kong relevant to intellectual property rights. c) Identify appropriate tools and method to measure and improve the productivity of business operations. d) Identify appropriate information technology applications to manage business information and to facilitate business operations. e) Recognise the importance of research and development towards business operations. f) Demonstrate the awareness of financial considerations in operation business. g) Recognise the importance of business development in business operations.	New CCO New CCO CCO(AM) 1.7(a) CCO(AM) 1.7(d) CCO(AM) 1.7(e) CCO(AM) 1.7(c) New CCO	11 11 11 11 11 11 11	

- N.B.**
- The training period must not be less than 104 weeks (24 months).
 - 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.
 - This guide should be read in conjunction with Section 3 of the M4 Routes to Membership.
 - During the training, each trainee is required to maintain Training Log Book, Record of Continuing Professional Development and Record of Training Outcomes.