THE HONG KONG INSTITUTION OF ENGINEERS
SCHEME "A" GRADUATE TRAINING
CONSOLIDATED MODEL TRAINING GUIDE
LOGISTICS AND TRANSPORTATION 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	
	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	

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	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 Occupational Safety and Health			
Location 4	***Description 4***			
	a) Demonstrate an understanding of the statutory health and safety requirements.	*CCO 1.5*	9	
	b) 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	
	c) Apply the safety management system in accordance with the industry standards and regulatory requirements.	*CCO 1.5*	7	
	2.3 Environment			
Location 5	***Description 5***			
	a) Demonstrate an understanding of the relevant statutory environmental requirements related to the trainee's discipline.	*CCO 1.6*	9	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	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	
	d) Demonstrate the awareness of the impact of transport pollution to the environment.	*New CO*	9	
	3. Engineering Practices			**62**
	3.1 Policy, Regulation and Basics			8
Location 6	***Description 6***			
	a) Recognise transport policies.	*CO 1.1*	1	
	b) Recognise regulatory framework.	*CO 1.1*	2	
	c) Recognise relevant laws, regulations and ordinances, customs and tariff rules.	*CO 1.1*	2	
	d) Recognise standards and codes of practice.	*CO 1.1*	2	
	e) Outline design manuals and statutory requirements.	*CO 1.1*	2	
	3.2 Data Collection, Survey, Measurement and Statistical Analysis			12
Location 7	***Description 7***			
	a) Perform data / information collection, treatment and analysis on quantitative and qualitative data	*CO 1.2*	3	
	<u>Plus select at least ONE of the following:</u>			
	i. Comprehend quality control sampling method.	*CO 1.2*	1	
	ii. Comprehend Statistical Process Control (SPC) / Statistical Quality Control (SQC) method.	*CO 1.2*	1	
	iii. Apply measuring instruments.	*CO 1.2*	1	
	iv. Explain database systems design and implementation.	*CO 1.2*	1	
	v. Summarise statistical analysis and practical recommendations.	*CO 1.2*	1	
	vi. Implement systems performance measurement.	*CO 1.2*	1	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	vii. Explain the planning, design and execution of traffic and transport surveys.	*CO 1.2*	1	
	viii. Comprehend automatic traffic counting technologies and devices.	*CO 1.2*	1	
	ix. Interpret transport statistics and data.	*CO 1.2*	1	
	x. Perform research for improvement initiatives.	*CO 1.2*	3	
	xi. Perform computer simulation to support analysis.	*CO 1.2*	3	
	3.3 Management, Operation and Other Activities Related to Logistics Systems or Transport Systems and Functional Specialist Training (choose 3.3.1 or 3.3.2, and 3.3.3)			42
Location 8	***Description 8***			
	3.3.1 Activities related to Logistics Systems			16
	3.3.1.1 Logistics Operations			
	a) Develop resource planning and allocation.	*CO 1.3.1*	4	
	b) Carry out environmentally responsible logistics operation.	*CO 1.3.1*	5	
	<u>Plus select at least ONE of the following:</u>			
	i. Apply logistics information systems.	*CO 1.3.1*	4	
	ii. Carry out warehouse operations.	*CO 1.3.1*	6	
	iii. Carry out freight forwarding process.	*CO 1.3.1*	6	
	iv. Integrate supply chain operation and management.	*CO 1.3.1*	6	
	v. Carry out third part logistics operation.	*CO 1.3.1*	6	
	vi. Carry out shipping and port logistics operation.	*CO 1.3.1*	6	
	vii. Carry out air logistics operation.	*CO 1.3.1*	6	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	viii. Support transportation management.	*CO 1.3.1*	6	
	ix. Comply with the logistics systems safety and security requirements, TAPA, C-TPAT, and AEO.	*CO 1.3.1*	5	
	x. Appraise the Digital Trade and Transportation Network (DTTN).	*CO 1.3.1*	1	
	xi. Carry out procedures to handle cold-chain, special and/or dangerous goods.	*CO 1.3.1*	5	
	3.3.1.2 Associated Technical Activities on Logistics Systems <u>Select at least ONE of the following:</u>			
	i. Carry out demand forecasting.	*CO 1.3.1*	6	
	ii. Carry out inventory control.	*CO 1.3.1*	6	
	iii. Appraise transportation operations and management.	*CO 1.3.1*	1	
	iv. Develop solutions on vehicle routing, scheduling and fleet dispatching.	*CO 1.3.1*	4	
	v. Carry out optimisation of transportation carrier operations.	*CO 1.3.1*	4	
	vi. Design supply chain network.	*CO 1.3.1*	4	
	vii. Carry out procurement and sourcing processes.	*CO 1.3.1*	6	
	viii. Plan supply chain management.	*CO 1.3.1*	6	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	ix. Carry out supply contracts management and collaboration.	*CO 1.3.1*	6	
	x. Support distribution management.	*CO 1.3.1*	6	
	xi. Carry out material handling and transfer automation processes.	*CO 1.3.1*	6	
	xii. Support warehouse operations and management.	*CO 1.3.1*	6	
	xiii. Design standard operations procedures.	*CO 1.3.1*	4	
	xiv. Apply wireless and mobile applications in logistics.	*CO 1.3.1*	1	
	3.3.1.3 Industrial Management and Commercial Activities			
	<u>Select at least TWO of the following:</u>			
	a) Examine organisation and methods in corporation.	*CO 1.3.1*	3	
	b) Appraise training / human resources management.	*CO 1.3.1*	1	
	c) Appraise purchasing / supply / supplier relationship management.	*CO 1.3.1*	1	
	d) Plan receiving and warehousing operations.	*CO 1.3.1*	4	
	e) Plan dispatch and transportation operations.	*CO 1.3.1*	4	
	f) Develop sales / marketing and business activities.	*CO 1.3.1*	4	
	g) Plan plant engineering / maintenance operations.	*CO 1.3.1*	4	
	h) Plan logistics and relevant support operations.	*CO 1.3.1*	4	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	i) Carry out security measures of plant, product and service.	*CO 1.3.1*	5	
	j) Carry out services product development and/or customer liaison.	*CO 1.3.1*	6	
	k) Carry out materials management e.g. sourcing, specifications and requirements.	*CO 1.3.1*	6	
	3.3.2 Activities related to Transport Networks / Systems			
	3.3.2.1 Network / System Assessment			
	a) Carry out multi-objective evaluations.	*CO 1.3.2*	5	
	b) Develop feasible solutions to transport problems.	*CO 1.3.2*	4	
	<u>Plus select at least ONE of the following:</u>			
	i. Analyse network demand and capacity.	*CO 1.3.2*	3	
	ii. Assess accessibility and risk of transport networks / systems.	*CO 1.3.2*	7	
	iii. Apply results from traffic impact assessment.	*CO 1.3.2*	1	
	iv. Apply results from pedestrian simulation and evacuation assessment.	*CO 1.3.2*	1	
	v. Support road safety audits.	*CO 1.3.2*	5	
	vi. Evaluate the results from economic, social and environment impact assessments.	*CO 1.3.2*	9	

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Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	3.3.2.2 Planning, Design of Transport Networks / Systems <u>Select at least FOUR of the following:</u>			
	a) Appraise the importance of territorial and regional transport planning.	*CO 1.3.2*	1	
	b) Appraise the importance of integration of land use and transport planning.	*CO 1.3.2*	1	
	c) Appraise the importance of autonomous / smart / sharing mobility, ICT.	*New CO*	1	
	d) Carry out transport master planning.	*CO 1.3.2*	4	
	e) Carry out highway planning, design and construction.	*CO 1.3.2*	4	
	f) Carry out public transport network planning.	*CO 1.3.2*	4	
	g) Carry out the design and planning of a Public Transport Interchange (PTI).	*CO 1.3.2*	4	
	h) Develop pedestrian network and pedestrianisation schemes.	*CO 1.3.2*	4	
	i) Develop cyclist network and bike plan.	*CO 1.3.2*	4	
	j) Develop goods vehicle plan.	*CO 1.3.2*	4	
	k) Design streetscape.	*CO 1.3.2*	4	
	l) Design layout of road junction and/or other traffic facilities.	*CO 1.3.2*	4	
	m) Develop traffic management schemes / calming measures.	*CO 1.3.2*	4	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	n) Design traffic signage, road markings and traffic aids.	*CO 1.3.2*	4	
	o) Develop traffic signal plan, ducting and details.	*CO 1.3.2*	4	
	p) Plan urban traffic control.	*CO 1.3.2*	4	
	q) Apply traffic and transport information systems.	*CO 1.3.2*	1	
	r) Plan parking management and control.	*CO 1.3.2*	4	
	s) Plan temporary traffic management and traffic diversion details.	*CO 1.3.2*	4	
	3.3.3 Functional Specialist Training (choose 3.3.3.1 or 3.3.3.2)			
	3.3.3.1 Logistics Industry			26
	a) Assess the solutions of demand forecasting and inventory control.	*CO 2*	12	
	<u>Plus at least ONE of the following:</u>			
	i. Plan warehouse operations.	*CO 2*	4	
	ii. Support procurement and supplier management.	*CO 2*	6	
	iii. Support resource planning and management.	*CO 2*	6	
	iv. Support air and port management.	*CO 2*	6	
	v. Support transportation management.	*CO 2*	6	
	vi. Support distribution management.	*CO 2*	6	
	vii. Develop logistics services.	*CO 2*	4	
	viii. Plan freight forwarding operations.	*CO 2*	4	

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Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	ix. Plan logistics systems development and implementation.	*CO 2*	4	
	x. Carry out reverse logistics operations.	*CO 2*	6	
	3.3.3.2 Transportation Industry			26
	i. Assess the solutions of demand forecasting and capacity estimation.	*CO 2*	12	
	Plus at least ONE of the following:			
	a) Develop traffic / transport models.	*CO 2*	4	
	b) Plan border and gateway operations.	*CO 2*	4	
	c) Apply GIS applications and spatial analysis.	*CO 2*	1	
	d) Apply Global Positioning Systems (GPS).	*CO 2*	1	
	e) Support operations of area licensing scheme, congestion charging and user toll systems.	*CO 2*	6	
	f) Apply Traffic Control and Surveillance Systems.	*CO 2*	1	
	g) Apply Intelligent Transport Systems (ITS).	*CO 2*	1	
	h) Carry out traffic accident investigation.	*CO 2*	3	
	i) Develop traffic accident prevention procedures.	*CO 2*	4	
	j) Apply parking control and information systems.	*CO 2*	1	
	k) Develop procedures for crowd control.	*CO 2*	4	
	l) Plan access control and security.	*CO 2*	5	

Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	m) Support the operation and management of public transport services.	*CO 2*	6	
	n) Design public transport routing / scheduling / service.	*CO 2*	4	
	o) Support public transport fares and ticketing systems.	*CO 2*	6	
	p) Carry out inter-modal hub/PTI design.	*CO 2*	4	
	q) Support railway signal system and control operations.	*CO 2*	6	
	r) Develop transport operations simulation applications.	*CO 2*	4	
	s) Support automatic fare / toll collection systems.	*CO 2*	6	
	t) Support regulatory control and enforcement systems.	*CO 2*	6	
	u) Support maintenance and assets management systems.	*CO 2*	6	
	4. Objective Training (the balance)			**41**
	This section covers any activities related to Logistics and Transportation Engineering. It should aim to develop skills and knowledge relating to personal qualities, communication, human resources management and business operational sense in addition to the technical, commercial and engineering knowledge acquired by the trainees during earlier parts of their training. Latest developments in the discipline should be included. All Training Outcomes, if not yet achieved in earlier parts of training, should be completed here.			

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	5. Other Common Core Outcomes for Continuous Development			**Conti-nuous**
	5.1 Human Resources Management			
Location 9	***Description 9***			
	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	
	5.2 Leadership and Management			
Location 10	***Description 10***			
	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	
	5.3 Stakeholder engagement / public consultation			
Location 11	***Description 11***			
	a) Demonstrate negotiating skills required for various engineering activities.	*CCO 1.4*	10	

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Location where Training will be done	Training Outcomes	Previous Reference	HKIE Compe-tence Ref.	Length of Time (weeks)
	5.4 Report writing and presentation			
Location 12	***Description 12***			
	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	
	5.5 Development of Personal Qualities			
Location 13	***Description 13***			
	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 sound time management skills for professional development.	*CCO 1.4*	11	
	d) Demonstrate a commitment to continuous development and enhancement.	*CCO 1.4*	11	
	5.6 Business Operations			
Location 14	***Description 14***			
	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	

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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 operating 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 104 weeks (24 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. This guide should be read in conjunction with Section 3 of the M3 Routes to Membership.
4. During the training, each trainee is required to maintain a Graduate Training Log Book, Record of Continuing Professional Development and Record of Training Outcomes.