

**THE HONG KONG INSTITUTION OF ENGINEERS  
ENGINEERING GRADUATE TRAINING SCHEME “A”**

**MODEL TRAINING GUIDE**

**ENVIRONMENTAL ENGINEERING**

**Model Training Guide (MTG)**

The Model Training Guide is a guide to Companies on the practical experiences considered relevant in the formal training of potential Professional Engineers.

**Training Programme (TP)**

The Training Programme is the plan prepared by a Company which is designed to meet the experiences listed in the MTG and to meet the objectives set out in the Record of Objectives. This ‘plan’ is presented for approval on Form TD1 Part 2 as a part of the Assessment/Reassessment procedures.

**Training Period - Nominally 3 years**

The length of the training is based on meeting the objectives and not determined by time. The times shown below are indicators only of the time that a trainee would normally take to meet the relevant objectives.

**Training Aim**

It is important to note that the Scheme “A” Graduate Training is designed to be a fast track by which a graduate can obtain full professional status. The training therefore covers both Technical and Professional matters.

**Continuing Professional Development (CPD)**

An implicit part of the Scheme “A” training is related to CPD which should be an integral and relevant part of the development of the graduate trainee.

**Training Programme Contents**

*(C=Core, D=Desirable)*

1. Professional & General (minimum 1 month in total)
  - 1.1 Fundamentals of environmental protection (minimum 1 week C)

Develop basic understanding and general knowledge in major issues related to protection of the environment

    - (a) History and development of the global environmental protection movement, including local green groups and relevant stakeholders

- (b) The ecological environment of Hong Kong and the immediate region. Its current status and development trend
- (c) The social context of environmental protection, and how it may affect engineering decisions such as site selection and technological options
- (d) The concept of Environmental Costs and Life Cycle Costs
- (e) The role of engineering and technology in the protection and enhancement of the natural and urban environment

1.2 Quality Assurance (minimum 1 week C)

Acquire experience in the application of quality assurance procedure(s)

- (a) Understand the principles and functions of commonly employed quality assurance and Environment Health and Safety systems and standards
- (b) Application of quality control and assurance in the execution of tasks for your employer

1.3 Environmental Legislation & Practices (minimum 2 weeks C)

Familiarity with the contents and the application of:

- (a) Environmental protection ordinances in Hong Kong, including supporting Technical Memoranda and relevant guidelines and best practice notes
- (b) Major international conventions, treaties, protocols or practices for the protection or improvement of the global environment
- (c) Hong Kong Planning Standards and Guidelines

2. Environmental Engineering Practices, Design, Impact Assessment, Pollution Control and Prevention (minimum 15 months in total)

2.1 Common practices (minimum 2 weeks C)

Gain understanding and practical experience on:

- (a) Use of Codes of Practice
- (b) Stages of design or design related investigations or modelling
- (c) Application of specific computer software in design and modelling, with clear awareness of limitations
- (d) Use of technical specifications
- (e) Methods of information retrieval

2.2 Design or Design Related Investigations/Modelling (minimum 6 months C)

Identify and define objectives of the design or design related investigations/ modelling, and evaluate alternatives:

- (a) Use and application of Briefs
- (b) Reliability of data and source of information
- (c) Sampling and analysis
- (d) Evaluation criteria

- (e) Design calculations and reports
- (f) Interpretation of data
- (g) Identification and selection of solutions
- (h) Short and long term implications of solutions
- (i) Economic, financial, environmental aspects of solution formulation

2.3 Environmental Impact Assessment and Management (minimum 6 months C)

Examine environmental impact associated with design solutions, their control and prevention

- (a) Familiarity with stages of the EIA process
- (b) Use and application of Study Briefs
- (c) Collection & interpretation of Data
- (d) Mitigation of environmental impacts
- (e) Environmental Monitoring and Audit
- (f) Setting up or implementation of Environmental Management Systems

2.4 Pollution Prevention and Control (minimum 2 months C)

- (a) Reduction or minimization of pollution at source
- (b) Use of natural /renewable resources
- (c) Understanding the concepts of Embodied Energy in construction materials
- (d) Avoidance of cross pollution or transformation from one form of pollution to another
- (e) Use of environmental assessment tools
- (f) Mitigation of environmental impact

2.5 Presentation of Solutions (minimum 2 weeks C)

- (a) Preparation and presentation of reports
- (b) Use of drawings, charts, plates and diagrams
- (c) Use of visual aids
- (d) Awareness of professional appearance

3. Engineering Administration & Management (minimum 8 months in total)

3.1 Communication of Project Requirements (minimum 2 months C)

Interpret, prepare and communicate design or design related details through:

- (a) Specifications
- (b) Conditions of Contract
- (c) Drawings

3.2 Procurement Procedures (minimum 2 months C)

Undertake elements of procurement procedures, including:

- (a) Tender Procedures
- (b) Tender Evaluation
- (c) Award of Contract
- (d) Contract Administration

3.3 Estimating (minimum 2 months C)

Estimating the costs of solutions, including:

- (a) Project capital costs
- (b) Operational and maintenance costs

3.4 Project/Work planning, budgeting, scheduling & management (minimum 2 months C)

- (a) Undertaking work planning, budgeting, scheduling and management of an identifiable section of a study, survey or capital project
- (b) Understanding the characteristics of different forms of contracts commonly used for environmental facilities such as: conventional design, then build; Design-and-Build; BOT, BOO and EPC

4. Environmental Engineering Field Experience (minimum 6 months in total)

4.1 Environmental Field Experience (minimum 3 months C)

Undertake, supervise or assist in managing the implementation of an environmental engineering project, including:

- (a) Construction or installation or testing of mitigation measures of environmental impacts
- (b) Interpretation of data, design manuals, drawings & specifications
- (c) Keeping of site records

4.2 Environmental Survey & Monitoring (minimum 3 months C)

Undertake, supervise or assist in managing an environmental survey or monitoring program

- (a) Planning, programming and control of the environmental monitoring work
- (b) Sampling and analysis
- (c) Quality control and data reliability
- (d) Maintenance of good site records
- (e) Data storage, retrieval and usage

5. Consolidation (minimum 6 months in total)

**N.B.**

1. The minimum training period must not be less than 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. This guide should be read in conjunction with Section 3 of the Membership Admission Requirements booklet.
4. During their training, each trainee is required to maintain a Graduate Training Log Book, CPD Logbook and Record of Objectives.