



**The Institution of Engineers, Malaysia.**

**THE PROFESSIONAL INTERVIEW**

**2001**

# **The Institution of Engineers, Malaysia**

## **The Professional Interview**

1. The Professional Interview will be held throughout the year.
2. All applications must be forwarded to the Hon. Secretary of the Institution. The Hon. Secretary will process the applications for approval by relevant Committees and those which have the required qualifications and practical experience will be informed by the Hon. Secretary that their applications to attend the Professional Interview has been approved.
3. Each candidate will be informed only after the relevant committees have approved their sitting for the Interviews. The names and addresses of the Principal Interviewers will then be posted to them following which the Interviewers will communicate with the candidates.
4. The Principal Interviewer shall write to each of his candidates on:—
  - (a) the date by which the documents are to be sent to him
  - (b) the place, time and date of the Professional Interview
  - (c) and the Essay Writing.
5. At the end of the Interview for each candidate, the drawings/documents, etc. are returned to him.

The Principal Interviewer retains:

- (a) two copies of the Report; and
- (b) the IEM/PI (3) certifying that the drawing/documents concerned were prepared by the candidate during his employment.

# The Institution of Engineers, Malaysia

## The Professional Interview Regulations for Entry and Submission of Documents

### 1. General

- 1.1 The Professional Interview will be held in approved centres in Malaysia.
- 1.2 An applicant to attend the Professional Interview must have attained the age of 24 on the last day for entry. He shall either be a Graduate of the Institution or he shall have followed in an engineering college or university, a regular course of study, extending over at least 3 years; approved by the Institution, leading to a degree or diploma; and in addition he shall have had at least 3 years approved experience in planning, design, execution or management of such works as are comprised within the profession of an Engineer or 3 years approved experience under the IEM training scheme.
- 1.3 A candidate for the Professional Interview must submit his application to the Institution with Form IEM/PI (1) and IEM/PI (2) together with the appropriate fees.
- 1.4 The Principle Interviewer shall write to each of his candidates on the date by which the documents are to be sent to him and the place, time and date of the Professional Interview and the Essay Writing.
- 1.5 The documents should be sent by the candidates to the Principal Interviewer by registered post securely packed. The parcel should be marked, at the top left hand corner, 'Professional Interview Documents'. Each sheet of drawing and every document must bear the candidate's name and must be fully described in Form IEM/PI (3).
- 1.6 **UNDER NO CIRCUMSTANCES MUST THE CANDIDATE'S DOCUMENTS BE SENT TO THE SECRETARIAT OF THE INSTITUTION OF ENGINEERS, MALAYSIA.**
- 1.7 Each accepted candidate will be required to be present at an appointed place and and time for an interview on the report submitted. After this interview the candidate may be required to return later that day or the next day to write an essay on a subject or subjects selected by the Interviewers, which may include writing specification. A candidate will not be permitted to introduce into the room any book or note other than a personal diary of engineering work carried out by him. A candidate may bring such a diary with him when he attends the interview.

1.8 Unsuccessful candidates will be informed of the reason for failure but no correspondence will be entertained. A list of successful candidates will be published within three months after the interview.

## 2. Documents to be Submitted

2.1 All candidates are required to submit:

- (a) two copies of a typewritten Report on A4 paper, giving an account of their training and experience, prepared in accordance with Section 4: and
- (b) Single copies of other documents and/or drawings (for details see Appendix A to D) duly certified and conforming to one of the alternatives in 2.2. Candidates are required to indicate under which alternatives they wish to apply.
- (c) For candidates under the IEM training scheme, their training record books.

## 2.2 Details of Documents

2.2.1 At least two and not more than four working drawings, detailed design calculations relating to one or more of the candidate's own submitted drawings, and specifications and a set of quantities, comprising abstract, take off sheets or shop list relating either to one of the submitted drawings or to another drawing, not prepared by the candidate, which must also be submitted. A candidate may submit an additional drawing not necessarily prepared by him, to illustrate his experience in the engineering works; OR

2.2.2 A part of a feasibility study involving functional and economic comparison of preliminary designs of an engineering system, OR a comprehensive report of a major engineering project, OR a system design of a major engineering works. The above documents should include the following:

- (i) at least one relevant drawing conveying essential features of details of a structure or systems:
- (ii) where appropriate at least three and not more than six sketches containing sufficient details to enable a draughtsman to work them up into drawings without further guidance.
- (iii) preliminary stress or systems analysis;
- (iv) quantity, cost or economic analysis as appropriate; OR

2.2.3 A candidate, who at the time of his application is engaged in engineering research work, may as an alternative submit, in duplicate, a report or published papers, evidence of research carried out by him. A thesis already accepted for a higher degree may not be acceptable but a candidate may submit a report incorporating a reasonable proportion of the matter for a higher degree thesis, together with evidence of new matters in extension of his research work. This is in addition to the Report on training and experience. The subject of his research should be related to the practice of engineering. The report may be illustrated by drawings, and must describe work actually carried out by the candidate, or for which he was substantially responsible. A survey of existing knowledge of the subject will be not be considered adequate. A candidate will be tested on his knowledge of matters

arising out of his research, and his command of the methods appropriate to the handling of them. A thesis, published papers or report must be certified, OR

- 2.2.4 A candidate whose experience lies in the maintenance of an electrical/mechanical plant or engineering system, can submit a detailed description of the operations of the plant or system together with the maintenance schedule which he has formulated. In his submission he should clearly indicate his contributions which would show sound applications of engineering principles. A critical appraisal of the design of the engineering system which may not be the work of the candidate, should be included. Details of modifications made to the existing system which are the work of the candidate should also be submitted. OR
- 2.2.5 A candidate over 45 years of age with at least 15 years experience, who is unable to produce drawings and documents prepared by him within recent years, may submit a detailed report of some of the major work(s) upon which he has been engaged, preferably accompanied by not more than six drawings (not necessarily prepared by him) to illustrate this work. This report, which is in addition to the Report of training experience should be of 3000 to 4000 words and must be submitted in duplicate.

### **3. Certification of Documents**

- 3.1 Every drawing and document is to be signed by the engineer, who is in a responsible position as the employer or the principal for it or under whom it was prepared. This person must also certify on the prescribed Form that these are the work of the candidate and if only a portion of the documents has been prepared by the candidate, this must be clearly indicated and initialled by the engineer. It is essential that the drawings and documents submitted shall be the work of the candidate in the ordinary course of his employment. Drawings and documents prepared as exercises during university or college courses are not admissible. The Report need only be signed by the candidate. All reasonable care will be taken of drawings, sketches, photographs, and other documents which will be returned to candidates, normally immediate after the Interview, but the Institution can accept no responsibility for them.

### **4. Report on Training and Experience**

- 4.1 The object of this Report is to inform the Interviewers about the candidate's engineering training and experience throughout his career. The Report, which should be of 1500 to 2000 words, must be typewritten on A4 paper and submitted in duplicate.
- 4.2 At the head of the Report the candidate must set out in chronological order, giving the months and years in each case, the inclusive dates of the particular periods of the training and experience he has had. He should include in this list any periods devoted to a degree or diploma course or other fulltime or sandwich course at an engineering college, to any vacation employment on engineering work, and to any post-graduate study or research. All time spent in military service or in any other capacity should be included to avoid any gaps in this list.

- 4.3 Immediately below this summary a candidate must state the total time he has spent:
- (a) in an engineer's office (or on research or as a teacher in engineering):
  - (b) in initial pre-design field and feasibility studies, e.g. surveying, soil investigations, system analysis, etc.;
  - (c) in or upon works, e.g. supervision or organisation of works, operations and maintenance.

When periods of time on works or in the office have to be aggregated to make up the periods required by the Bylaws, full details must be tabulated.

- 4.4 In the Report (which must strictly avoid resemblance to a mere inventory of works prepared and executed) the candidate must deal fully with the tasks on which he has been employed, whether in design, construction, operations, manufacture or research. This account should be in chronological sequence and should be explained clearly the precise position, the candidate has occupied in each case, and the degree of responsibility assigned to him. He should enlarge on any special problems he has met and, within the permissible limits, explain how they were dealt with, and should also enlarge on any subject in which he has specialised or obtained exceptionally good experience. Where possible, some indications of the size and cost of the works should be given.

- 4.5 Throughout the Report reference should be made to the candidate's employers or immediate superiors who have been responsible for his practical training or under whom he has served, giving the names and appointments and stating their grade, if any, in the Institution.

## 5. The Professional Interview

- 5.1 When a candidate attends the Professional Interview all his practical experience will be assessed not only on a time basis but also on merit. In general the Interview is intended to test the candidate's:

- (a) grasp of the application of engineering principles to the solutions of problems arising in the investigation, planning, design or construction of engineering works or in research;
- (b) capacity to accept professional responsibility;
- (c) ability to communicate.

- 5.2 Thus, at the Professional Interview a candidate, regardless of his branch or speciality, will be required to show that he can apply in practice the theory of at least one of the branches of engineering science, and has acquired an understanding of the fundamental processes of investigation, planning, design or construction by actually taking part in, making a contribution to, one or more, of these processes in connection with an engineering project, whether or not it is brought to fruition.

- 5.3 A candidate is required to submit certain documents, to attend for an oral examination, to write an essay and to answer question(s) on topics relating to the Code of Professional Conduct. A candidate is expected to satisfy the Interviewers in all these aspects of the Interview.

5.4 **The Oral Examination:** Each accepted candidate will be required to attend at an appointed place and time to be questioned by two senior Corporate Members of the Institution on his practical experience with particular reference to its quality.

5.5 **The Essay : Section A and Section B**

5.5.1 A candidate shall, after the oral examination, be required to write an essay on one or two alternative subjects selected by the Interviewers (Section A) and answer a question on the Code of Professional Conduct (Section B).

5.5.2 Both sections of the essay are intended primarily as a test of the candidate's knowledge of and ability to communicate in good English, and to marshal his thoughts and then express them on paper in a clear and concise manner. The subject will be chosen with this in mind and be ones with which the candidate may be expected to be familiar with and which he should be able to answer. 1½ hours will be allowed for each section.

5.5.3 In Section B the candidate will be asked to answer one question from two alternative questions selected by the Interviewers from a list of 12 questions previously available to the candidate.

These questions will be in relation to the Code of Professional Conduct.

5.5.4 It is the hope of the Council that young engineers will be encouraged to read and discuss a wide range of current topics and be aware of the Code of Professional Conduct.

#### APPENDIX A: GUIDANCE ON DOCUMENTS

A. A candidate whose academic qualification is in engineering (other than a research candidate or a teacher in engineering)

A1. A candidate, other than a research candidate whose academic qualification is in engineering must:

(a) have obtained an exempting degree, or equivalent qualification in engineering; and

(b) have had a minimum period of practical experience of a satisfactory nature.

This minimum period of experience is as stated in para. 1.2 of the Professional Interview Regulations.

A2. A candidate will be required to have had experience in:

(a) (i) the investigation, planning, design construction or management of engineering works and/or

(ii) specialist experience (that have contributed to the investigation, planning, design, construction or management of engineering works); and

(b) will be required to satisfy the Interviewers that he had had sufficient field or other experience to enable him to appreciate the problems involved in the practical application of his studies and the contribution made by those studies to the carrying out of engineering projects.

- A3. Provided a candidate has met the requirements of para A2 the period of practical experience required to comply with para A1 (b) may include experience in one of the following:
- (a) engineering research;
  - (b) the teaching of engineering
  - (c) approved courses of full-time postgraduate studies.
- A4. A candidate will be required to submit two copies of a report giving an account of his training and experience prepared in accordance with The Professional Interview Regulations.
- A5. A candidate will also be required to submit single copies of documents prepared in the course of this experience as required under the Professional Interview Regulations.
- A6. It is essential that the drawings and documents submitted should have been made in the ordinary course of the candidate's employment. Drawings and documents prepared as exercises during university or college courses are not admissible.
- A7. It is essential for drawings submitted by candidates to be of works that is intended to be carried out. Designs for substantial temporary works incidental to construction will be accepted. Drawings should be complete, and properly dimensioned and annotated having regard to the purpose they are required to serve. They should show the candidate's intention clearly and unmistakably.
- A8. Calculations, including those using standard computer programs, should be of the form usually required for the particular type of work or, where this is not applicable, notes explaining the considerations affecting the design and reasons for the methods adopted should be submitted. If specialist computer programs are submitted they must be substantially the candidate's own work and must be accompanied by proper documentation.
- A9. A candidate submitting documents of single copies only relating to a feasibility study or report work must submit part of a feasibility study or report for a project, or a functional and economic comparison of preliminary designs for a works or system, or a study of a technical design aspect of a chosen layout or system involving several works, which must include, in all cases, the following:
- (a) at least 2 and not more than 4 drawings conveying essential features or details of a works or system; the drawings, which need not have been prepared entirely by the candidate, must none-the-less have been based on preliminary drawings and sketches prepared by him; and
  - (b) preliminary stress or systems analyses or other relevant details as appropriate, or properly documented computer programs for such analyses which have been written by the candidate; and
  - (c) quantity, cost or economic analyses as appropriate.

A candidate may submit an additional drawing to illustrate his experience on site or in the field.



A10. A candidate submitting documents relating to the designs or construction of engineering works must submit single copies only.

- (a) At least 2 and not more than 4 working drawings; the drawing which need not have been prepared entirely by the candidate, must none-the-less have been based on preliminary drawings and sketches prepared by him; and
- (b) detailed design calculations relating to one or more of the candidate's submitted drawings; or properly documented computer programs for such calculations which have been written by the candidate; and
- (c) a set of quantities including taking-off sheets or cost estimates relating either to one of the submitted drawings or to another drawing not prepared by the candidate which must also be submitted.

A candidate may submit an additional drawing to illustrate his experience on site or in the field.

A11. A candidate submitting documents relating to specialist experience must submit single copies only:

- (a) appropriate drawings, and calculations or computer programs relating to the designs of a project or system analysis; and
- (b) notes of records of field work.

A12. A candidate over 45 years of age with at least 15 years' experience, who is unable to produce drawings and documents prepared by him within recent years, may submit a detailed report of some of the major engineering works(s) upon which he has been engaged, preferably accompanied by not more than 6 drawings (not necessarily prepared by him) to illustrate this work. This report, which is in addition to the report of training and experience, should be of 3000 to 4000 words and must be submitted in duplicate.

#### APPENDIX B: A CANDIDATE WHO IS A TEACHER IN ENGINEERING

B1. A candidate who wishes to be interviewed on the basis as a teacher of engineering must:—

- (a) posses the necessary academic qualification and
- (b) be engaged in teaching an approved engineering degree/advanced diploma course at the time of his application and
- (c) have been engaged, in teaching the final two years of the engineering course for a period of at least 1 year;
- (d) have had the equivalent of one year's practical engineering experience which can be made up of separate parts and

- (e) have had in addition to (c) and (d) either
  - (1) not less than 3 years's experience which may include a period on
  - (1) an approved course of full time post-graduate study or
  - (2) on research for the award of a higher degree or
  - (3) research done whilst holding the position of teacher in an approved degree course.

B2. A candidate must submit:

- (a) two copies of a report giving an account of his training and experience prepared in accordance with The Professional Interview Regulations; and
- (b) two copies of a report of not more than 4000 words in evidence of research carried out by him. This report should include a brief summary of the candidate's research work, stating the subject matter and objectives, together with a short list of any papers he has published. A thesis prepared for a higher degree is not acceptable but a candidate may include the matter of this thesis together with new matter.

The report may be illustrated by drawings, and must describe work actually carried out by the candidates, or for which he was substantially responsible. A survey of existing knowledge of a subject will not be considered adequate. A candidate will be tested on his knowledge of matters arising out of his research, his command of methods appropriate to the handling of them, and his understanding of the relevance of this work to engineering.

The report should include details of the engineering course taught by him.

#### APPENDIX C:

##### C. A RESEARCH CANDIDATE

C1. A candidate who wishes to be interviewed on the basis of engineering research must:

- (a) possess the necessary academic qualification and
- (b) be engaged on engineering research work at the time of his application; and
- (c) have been engaged, in a responsible position, on engineering research for a period of at least 2 years; and
- (d) have had, in addition to (c),

either

- (i) not less than 4 years' practical experience which may include
  - (1) up to 1 year on an approved course of full time post graduate study;
  - (2) up to 3 years on research for the award of a higher degree,
  - (3) research done whilst holding the position of teacher in an approved degree course;

or

- (iii) not less than 3 years practical experience of which not less than 2 years have been in the investigation, planning design, construction or management of engineering works.

**C2 A Candidate must submit**

- (a) two copies of a report giving an account of his training and experience prepared in accordance with The Professional Interview Regulations; and
- (b) two copies of a report of not more than 4000 words in evidence of research carried out by him. This report should include a brief summary of the candidate's research work, stating the subject matter and objectives, together with a short list of any papers he has published. A thesis prepared for a higher degree is not acceptable but a candidate may include the matter of this thesis together with new matter. The candidate's experience should include designing and setting up equipment and carrying out the research, reporting on the results and drawing appropriate conclusions.

The report may be illustrated by drawings, and must describe work actually carried out by the candidate or for which he was substantially responsible. A survey of existing knowledge of a subject will not be considered adequate. A candidate will be tested on his knowledge of matters arising out of his research, his command of the methods appropriate to the handling of them, and his understanding of the relevance of this work to engineering.

**D GUIDANCE ON SPECIFIC REQUIREMENTS FOR THE SPECIALIST BRANCHES OF ENGINEERING IS LISTED BELOW:**

**D1 Aeronautical**

- (a) Where appropriate drawings and calculations for the design of part of an aircraft or guided missile, or the estimation of the performance of its engines or its structures; maintenance schedules for commercial airlines or the armed services;

and

- (b) Notes or records, such as wind tunnel tests on models of aircraft or on parts thereof; flights trials; strength tests on wings or other components; vibration and stiffness tests; methods of construction and joining parts.

**D2 Chemical**

- (a) Where appropriate drawings and calculations for the design, in whole or in part, of an item of work relating to chemical or process engineering, e.g. heat exchangers; absorption towers; distillation plant; liquor filters; gas dedusting equipment; plant layouts.

and

- (b) Notes or records such as: the operation and/or testing of chemical plant and items of equipment; the preparation of process flow sheets showing heat and mass balances; maintenance and planning co-ordination; the economic assessment of alternative schemes; the instrumentation and automatic engineering techniques.

**D3 Civil**

- (a) Drawings and calculations for the design of a civil engineering work.

and

- (b) A set of quantities relating to one of the drawings or, if this is not possible, quantities taken by the candidate from drawings not prepared by him will be accepted and in this case, a tracing or print of the drawings should be attached.

In lieu of the above, Civil engineering candidates of specialised area of study may submit their documents as follows:—

**D3.1 Hydrology**

(a) Drawings and calculations and quantities for the design of an item of work relating to hydrology, e.g. river gauging stations; lysimeters or percolation gauges; climatological stations; test wells.

and

(b) Records of fieldwork in surface or ground water hydrology; statistical analysis of hydrological data leading to the evaluation of water resources; methods of flood and drought forecasting.

**D3.2 Soil and Rock Mechanics**

(a) Drawings and calculations for the design of a project involving soil or rock mechanics, such as the stability of a dam and the adjoining valley; the stability and anticipated settlement of buildings; retaining walls; railway embankments, etc.

and

(b) Notes and records from site investigations; field and laboratory test; trial sections etc. for the purpose of the foregoing.

**D3.3 Permanent Way**

(a) Drawings and calculations for the detailed design of a major junction layout with a schedule of materials; details of timbering and programme for carrying out the work.

and

(b) Notes or records such as the survey for and setting out of a layout; investigation into the strength or stability of tracks, assessment of permissible speeds.

**Note:** Design and construction experience in some other branch of civil engineering will be required in addition to that described under 'Permanent Way'

**D3.4 Public Health Engineering**

(a) Drawings and calculations for the design of works related to any branch of public health engineering, e.g. water supply treatment, sewerage and sewerage treatment; land drainage and river improvement; refuse disposal plants.

and

(b) Notes or records of a field study for a public health engineering project.

**D3.5 Highway**

(a) Drawings, calculations and quantities to show adequate knowledge of the practical application of the theory of civil engineering design in relation to highway engineering e.g. the design of bridges; retaining walls; earthworks, paving and drainage.

and

(b) Notes or records on highway capacity standards in relation to estimated traffic volumes with particular reference to junction layout; highway materials and pavement design; road location in urban or rural areas.

### **D3.6 Transportation**

- (a) Drawings, diagrams and appropriate calculations to show adequate knowledge of the application of the principles of transportation engineering to practical problems and of the use of current techniques in the analysis and planning of transport systems.

and

- (b) Notes or records on the conduct of traffic surveys, and estimation of future transport needs, and on any items such as the following:—

Statistical analysis of data derived from traffic studies; economic factors in relation to a transportation scheme; the functional design of terminal facilities for road, rail or air transport; design and operation of traffic management schemes; the functional design of road or rail networks; the design of traffic signal systems.

### **D3.7 Town Planning**

- (a) Drawing and maps, written statement, and report of the surveys which have been prepared for submission to the appropriate authority in the form of a Development Plan under the Town and Country Planning Act, or similar legislation.

and

- (b) Notes on the factors governing the proposals for population densities, zoning, communications, and basic layout.

### **D3.8 Drainage and Irrigation**

- (a) Feasibility Report on Drainage, Irrigation or Flood Mitigation Project

or

Drawings and Calculations for the Design of a Drainage, Irrigation or Flood Mitigation System

and

- (b) Records of Field Work in Drainage, Irrigation or Flood Mitigation Works

### **D4 Electrical, Electronics, and Communications**

- (a) Drawings, charts, calculations for the design, installation, construction and operation in whole or in part of a system or an item of work related to electrical engineering, for example, utilization of electric plant and equipment such as generating plant, switchgear, transformers, substations, transmission and distribution, electric drive, communications, radio, electronic, instrumentation and control, etc.

and

- (b) Notes or records on operation, maintenance, testing of electrical plant and equipment or telecommunications equipment; generation, transmission and distribution of power; applications of electricity to transport, industry, radio broadcasting and commercial and domestic premises, etc.

### **D5 Gas**

- (a) Drawings and appropriate calculations, including basic considerations for design of an item of work related to gas engineering e.g. gaswork plant in general; gas transmission or distribution system; boosting, storage, and control equipment; gas-consuming units — domestic, commercial or industrial.

and

- (b) A record of some particular practical work in the field such as: the operation of a gas — making plant and the evaluation of any special features; the installation of a gas-transmission pipeline; the performance of a gas-fired industrial furnace for a specific duty.

**D6 Marine**

(a) Where appropriate, drawings and calculations for the design in whole or in part, of an item of work related to marine engineering, such as: steam or internal combustion propulsion, or auxillary machinery, such as electrical generating sets;

and

(b) Notes or records, such as the operation or testing of one or more of the foregoing.

**D7 Mechanical**

(a) Where appropriate drawings and calculations for the design of an item of work related to mechanical engineering, such as: machinery or machine parts; power-house or machine-shop equipment; factory or workshop layouts; earth moving and quarry plants, compressed air, equipment, diesel traction units, pumps, engines, etc.

and

(b) Notes or records on methods of machiney; accuracy; workmanship, tolerances; testing properties of materials; performance of and tests on plant and machines; workshop organisation, maintenance, work study, etc.

**D8 Mining**

(a) Drawings and calculations relating to a mining or metallurgical project such as: shaft design; winding or haulage systems; design of underground or open pit workings; gravel pump and dredge operations, a major ventilation survey; items of metallurgical plant connected with crushing, ore dressings or extractive metallurgy; coal preparation plant.

and

(b) Notes or records on the operation or testing of mining or metallurgical plant and equipment, such as: power loaders; high-speed tunnelling equipment; fire-fighting ranges and equipment; pumping equipment; crushing and floatation equipment; furnaces, electro-metallurgical and hydro-metallurgical plant.

**D9 Naval Architecture and Shipbuilding**

(a) Drawing and calculations for an item of work relating to: a design study for a modern ship; the launching of a large ship; a typical ship's system, e.g. oil fuel, ballast, fresh and salt water, ventilation and air-conditioning; cargo handling.

and

(b) Notes or records such as: estimate of ship performance including model tests and propeller design; trials at sea; e.g. propulsive performance; sea keeping; vibration; planning, production and quality control applied to shipbuilding.

**D10 Production Engineering**

(a) Where appropriate, drawing and calculations for the design of an item of work related to production engineering, e.g. machine tool engineering; factory layout and materials handling; work analysis; manufacturing systems, automations, etc.

and

(b) Notes or records such as design for production; forming processes; quality and reliability; techniques of operational research; production cost analysis; human aspects, industrial safety consideration.