

GUIDELINES FOR APPLICATION FOR REGISTRATION AS SPECIALIST PROFESSIONAL ENGINEER IN LIFT AND ESCALATOR ENGINEERING

Introduction

1. A PE in electrical or mechanical engineering may apply to be registered as a specialist professional engineer in lift and escalator engineering if he has a valid practicing certificate and meets one of the following sets of conditions as specified in the Fourth Schedule of the PE Rules as follows:

Set (A)

- (i) the applicant is approved by the Commissioner for Workplace Safety and Health under section 33 of the Workplace Safety and Health Act (Cap. 354A) as an authorised examiner for the purpose of carrying out any prescribed examination or test of any hoist or lift; and
- (ii) the application for registration as a specialist professional engineer is submitted before 18 January 2018.

Set (B)

- (i) the applicant is approved by the Commissioner for Workplace Safety and Health under section 33 of the Workplace Safety and Health Act as an authorised examiner for the purpose of carrying out any prescribed examination or test of any lifting machine as defined in section 4 (1) of the Workplace Safety and Health Act;
- (ii) the applicant has sat for and passed a specialist registration examination on lift and escalator engineering conducted by the Board; and
- (iii) the application for registration as a specialist professional engineer is submitted before 18 January 2018.

Set (C)

- (i) the applicant has not less than 5 years (in aggregate) of such experience in lift and escalator engineering or in any field related to lifting equipment engineering or building services engineering (whether in Singapore or elsewhere) as may be acceptable to the Board, of which at least 3 years of that experience was obtained whilst practising as a registered professional engineer in Singapore;
- (ii) the applicant has successfully completed a training course conducted by the Building and Construction Authority on lift and escalator engineering as specified by the Board; and
- (iii) the applicant has sat for and passed a specialist registration examination on lift and escalator engineering conducted by the Board.

(Note: For the purpose of condition Set (C) (ii), the training course specified by the Board is the 'Lift and Escalator Course for Engineers' conducted by the BCA Academy.)

Examination

2. One of the requirements as mentioned in para 1 above is that a Set (B) or Set (C) applicant must sit for and pass a specialist registration examination on lift and escalator engineering conducted by the Board. The specialist registration examination on lift and escalator engineering conducted by the Board is an oral examination and will be conducted together with the professional interview for registration as specialist PE in lift and escalator engineering in a single session. The syllabus for the examination is as specified in Annex A below.

Report

3. An application by a Set (B) or Set (C) applicant shall be accompanied by a report on practical

experience that describes in particular the experience that the applicant has acquired in lift and escalator engineering or in any field related to lifting equipment engineering or building services engineering. It should include the tasks that the applicant has been involved in, the levels of his responsibilities, the identification of special engineering problems encountered and the demonstration of the use of engineering knowledge, experience and judgment to resolve them etc. The Report shall be about 2,000 words and must not be a mere inventory of work done.

4. The report shall be typewritten and 5 copies shall be submitted (i.e. 1 original and 4 photostat copies). The report must be signed by the applicant himself/herself and verified by his/her employers or any registered Professional Engineer in Singapore. Verification by an employer should be accompanied by a stamp with name, designation and name of company. Verification by a professional engineer should be accompanied by the professional engineer's stamp.

Interview

5. The Board would require a Set (B) or Set (C) applicant to undergo an interview. The interview would cover the following:
 - a) to determine the type and duration of practical experience in lift and escalator engineering or in any field related to lifting equipment engineering or building services engineering;
 - b) to assess the basic understanding, and scope and depth of the applicant's practical experience in lift and escalator engineering or in any field related to lifting equipment engineering or building services engineering, in particular, to establish the level of responsibility – i.e. whether the applicant's nature of work is at subordinate level or at the level of making technical decisions and to establish whether his experience is sufficient to enable him to act and take technical decisions independently.
6. The applicant could be queried on his involvement in one or more phases of a project such as planning, design & analysis, construction, and operation & maintenance in relation to lift and escalator engineering or in any field related to lifting equipment engineering or building services engineering.
7. An applicant is required to demonstrate that he has substantial practical experience and knowledge as to be competent in core areas of lift and escalator engineering or in any field related to lifting equipment engineering or building services engineering mentioned above. In addition, the conduct, attitude and professionalism that the applicant displays during the interview would also be considered.
8. When registering a professional engineer in the specialised branch of lift and escalator engineering, the Board may impose such conditions as it thinks fit.

Fees

9. The fees for an application by a Set (B) or Set (C) applicant to sit for the specialist registration examination in the branch of lift and escalator engineering is \$450. The fees for an application by a Set (A), Set (B) or Set (C) applicant to register as a specialist professional engineer in lift and escalator engineering is \$300.

Submission

10. An application to sit for the specialist registration examination and/or register as specialist professional engineer in the branch of lift and escalator engineering shall be submitted in person and made on prescribed forms issued by the Professional Engineers Board, Singapore. The application must be legibly written in ink or type-written and 5 copies shall be submitted.

SYLLABUS FOR SPECIALIST REGISTRATION EXAMINATION IN LIFT AND ESCALATOR ENGINEERING

Legislations and Guidelines Related To Lift and Escalator Engineering

1. Building Control Act
2. Building Maintenance and Strata Management Act
3. Building Maintenance Strata Management (Lift, Escalator and Building Maintenance) Regulations 2016
4. Workplace Safety and Health Act
5. Workplace Safety and Health (General Provisions) Regulations
6. Workplace Safety and Health (Risk Management) Regulations

Codes and Standards Related to Lift and Escalator Engineering

The applicant shall have an in-depth understanding of the relevant local and international codes and standards including but not limited to the following:

1. ASME 18.1 – Safety Standard For Platform Lifts And Stairway Chairlifts
2. EN 81-41 – Safety Rules For The Construction And Installation Of Lifts – Special Lifts For The Transport Of Persons And Goods
3. EN 81-40 – Safety Rules For The Construction And Installation Of Lifts – Special Lifts For The Transport Of Persons And Goods
4. SS 595- Singapore Standards For Steel Wire Ropes For Hoisting
5. SS CP15 - Code of Practice for Installation, Operation and Maintenance of Escalators and Passenger Conveyors
6. SS CP 550 - Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts

Other Relevant Areas in Lift and Escalator Engineering

1. Other than possessing knowledge in the relevant prevailing codes and standards above, candidates applying to be a specialist professional engineer in lift and escalator engineering are required to possess knowledge in the fundamental principles of the following aspects of lift and escalator engineering:
 - a) Have good knowledge of the design, installation, operations, testing and commissioning of lift and escalators.
 - b) Conversant with the testing and examination of lift under the purview of Workplace Safety and Health Act including visual examination, functional test and load test.

Machine Dynamics

The applicant shall be knowledgeable in the following areas:

1. Kinetics of machines
2. Force analysis of mechanisms
3. Balancing
4. Rotational forces analysis
5. Brakes - types and uses
6. Geared and gearless drive systems
7. Chain drive (escalators)

Wire Ropes

The applicant shall be knowledgeable in the following areas:

1. Types of wire ropes
2. Discard criteria for wire ropes and typical failures
3. Wire rope terminations
4. Roping systems

Hydraulic Systems

The applicant shall be knowledgeable in the following areas:

1. Hydraulic power units
2. Hydraulic cylinders and rams
3. Pipes, control valves and rupture valves
4. Temperature effects on pressure systems
5. Critical parameters in pressure systems
6. Common failures

Control Systems

The applicant shall be knowledgeable in the following areas:

1. Understanding of control systems, example:
 - a) Programmable logic controller
 - b) Integrated circuit boards
2. System control hardware (relays, transducers, interlocks)

3. Trouble shooting control systems
4. Testing of control systems

Electrical System

The applicant shall be knowledgeable in the following areas:

1. Working knowledge of electrical installation
2. Understanding electrical drawings
3. Earthing methodologies
4. Electrical motors (AC and DC)
5. Electric drive systems
6. Switches

Welding and Non-destructive Testing (NDT)

The applicant shall be knowledgeable in the following areas:

1. General principles of NDT
2. Typical welding methods
3. Welding process knowledge
4. Welding metallurgy
5. Typical welding faults and its identification
6. Welding codes and standards (Including ASME Codes, AWS Standards, API Standards)
7. Uses and limitations of various NDTs
8. In depth knowledge of various NDTs