The background features a blue and white grid pattern. Two stylized diagrams of lift or escalator cars are positioned vertically, one above the other. A network of blue lines, representing cables or tracks, weaves across the grid, connecting the two car diagrams and extending towards the right edge of the page.

# Code of Practice for Safety at Work (Lift and Escalator)



Occupational Safety and Health Branch  
Labour Department

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Occupational Safety and Health Branch  
Labour Department  
October 1997

This Code of Practice is prepared by the  
Occupational Safety and Health Branch  
Labour Department

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# Contents

Section		Page
1	Foreword	1
2	Introduction	2
3	Definitions	3-4
4	Responsibilities	5-7
	4.1 General	5
	4.2 Responsibilities of Proprietors or Contractors	5-7
	4.3 Responsibilities of Workers	6-7
5	Training, Information and Instruction	8-9
	5.1 All Personnel	8
	5.2 Engineers/Supervisors	9
6	Management System for Safety and Health	10-15
	6.1 Work Procedures	10
	6.2 Responsibility for Work on Site	10
	6.3 Well-being of Persons Working Alone	10-11
	6.4 Communication	11
	6.5 Record Keeping System	11-12
	6.6 Site Safety Assessment	12-15
7	Basic Safety Precautions	16-30
	7.1 Working at Height	16-18
	7.2 Manual Handling	18-20
	7.3 Mechanical Lifting	20-22
	7.4 Fire Prevention	22-23
	7.5 Welding and Cutting	23-27
	7.6 Rope Socketing	27-29
	7.7 Environment	29
	7.8 Protective Equipment	29-30
	7.9 Display of Warning Signs/Notices	30

Section		Page
8	Facilities Safety	31-37
	8.1 Tools and Equipment	31-33
	8.2 Portable Ladders	33-34
	8.3 General Electrical Safety	34-37
9	Safety Practices for Working on Lifts	38-46
	9.1 General Safety Practices for Working on Lifts	38-39
	9.2 Safety Practices for Working on Car Top	39-41
	9.3 Safety Practices for Working below a Lift Car	41
	9.4 Safety Practices for Working at Lift Landings	41-42
	9.5 Safety Practices for Working in Lift Machine and Pulley Rooms	42-44
	9.6 Safety Practices for Working on Observation or Partially-enclosed Lifts	45
	9.7 Safety Practices for Working on Dumbwaiters	45-46
10	Safety Practices for Working on Escalators	47-49
11	Safety Practices for Installation and Dismantling of Lifts/Escalators	50-51
12	Safety Practices for Special Overhaul/ Repair Works on Lifts/Escalators	52-54
13	References	55-56
	Appendices	57-64

This Code of Practice focuses on workers' safety and it recommends safe practices for those proprietors or contractors to protect their employees engaging in lift and escalator works, i.e. installation, commissioning, alteration, examination, inspection, testing, servicing/maintenance, repairing and dismantling work on lifts and escalators (excluding fabrication of lifts/escalators during manufacturing process).

This is an approved code issued by the Commissioner for Labour under Section 7A(1) of the Factories and Industrial Undertakings Ordinance (FIUO), Cap. 59. It is important to note that compliance with this Code does not of itself confer immunity from legal obligations in Hong Kong. Proprietors and contractors are also reminded to observe other government departments' requirements, such as the Electrical and Mechanical Services Department's Codes of Practice and regulations so as to discharge their legal duties in respect of lift and escalator work.

Throughout this Code, we have quoted the relevant safety standards of the British Standards Institution. However, if there are some other national, international standards or provisions which are equivalent, they would be acceptable as alternatives. In addition, statutory provisions referred to or cited in this Code are those in force as at 1st October 1997.

This is to acknowledge the British Standards Institution for permission to make reference to the relevant British Standards on lift and escalator safety in this Code.

In the lift/escalator trade, the safety of the persons engaged in lift/escalator work is the responsibility of the proprietors/contractors, the supervisors and the persons working on lifts/escalators. Besides, the persons having effective control of those premises containing the lifts/escalators also have their role in the issue.

All persons working on lifts/escalators are expected to take due care and pay attention to potential hazards, make proper use of safeguards provided and follow defined working procedures such that accidents and ill health can be avoided.

### 3.1 “Proprietor/Contractor”

They are defined in Section 2(1) of the FIUO as follows:-

“Proprietor” in relation to any industrial undertaking or notifiable workplace includes the person for the time being having the management or control of the business carried on in such industrial undertaking or notifiable workplace and includes a body corporate and a firm and also the occupier of any industrial undertaking or notifiable workplace and the agent of such occupier.

“Contractor” in relation to construction work, means any person or firm engaged in carrying out construction work by way of trade or business, either on his own account or pursuant to a contract or arrangement entered into with another person, including the Government of the Hong Kong Special Administration Region or any public body.

### 3.2 For section 7.3 of the Code, the following terms have the same meaning as those defined in Regulation 3 of the Factories and Industrial Undertakings (Lifting Appliances & Lifting Gear) Regulations [FIU(LALG)R]:-

“Competent examiner”

“Competent person”

### 3.3 Reference for the definitions of the following terms found in the Code can be made to the Code of Practice on the Design and Construction of Lifts and Escalators published by the Electrical and Mechanical Services Department (EMSD): -

#### 3.3.1 For lift works

- Counterweight
- Landing
- Lift car
- Lift machine
- Machine room
- Main switch
- Multiple installation

- Pit
- Pulley room
- Well

### 3.3.2 For escalator works

- Combs
- Handrail
- Main switch

## 4.1 General

4.1.1 It is the general duty of a proprietor of an industrial undertaking or a contractor of a construction site in carrying out work concerning lift or escalator installation, maintenance, repair, alteration or demolition in existing building or construction site to ensure, so far as is reasonably practicable, the health and safety at work of all persons employed by him at the industrial undertaking (Section 6A of the FIUO).

4.1.2 The following summarizes the responsibilities of various parties involved in carrying out work concerning lift or escalator installation, maintenance, repair, alteration or demolition in fulfilling the provisions under the general duties clauses, Sections 6A and 6B of the FIUO which are set out in Appendix I for reference.

## 4.2 Responsibilities of Proprietors or Contractors

4.2.1 In carrying out work concerning lift or escalator installation, maintenance, repair, alteration or demolition, the proprietor or contractor has the direct responsibility for ensuring, so far as is reasonably practicable, the health and safety of all persons employed by him (Section 6A of the FIUO).

4.2.2 Particular responsibilities of the proprietors or contractors include:-

- a) planning and carrying out an assessment of the works including selection of appropriate methods of carrying out such works;
- b) appointing suitable supervisors and engineers in writing to take charge of immediate control of the work on lift/escalator;
- c) employing sufficient number of workers who are competent in lift/escalator works to carry out the works, and that they should be over age of 18 years with the exception for those under the apprentice training

- scheme or the approved training course of the Construction Industry Training Authority;
- d) ensuring that the training and experience of all team members are commensurate with the assigned task and providing training if necessary;
  - e) ensuring that necessary tools, plant and equipment are properly maintained and are available for immediate use and that a plant/equipment register is kept up-to-date containing maintenance records and test and examination certificates;
  - f) providing and ensuring the maintenance of a Job Record Book;
  - g) providing necessary information, drawings, manuals, instructions and training to the workers on all aspects related to the works including the use of tools, plant/equipment, safe practices and emergency procedures;
  - h) ensuring that adequate number of persons trained in first aid are included in the site working personnel and that necessary first aid equipment such as the first aid box, etc. are provided and maintained in accordance with the requirements under the Construction Sites (Safety) Regulations [CS(S)R];
  - i) ensuring that the work is carried out in a suitable and safe place with the consent of persons having control of that place; and
  - j) ensuring that effective communication exists between the place at which the work is being carried out, the persons having control of that place, and the emergency services including police, fire and ambulance service.

### 4.3 Responsibilities of Workers

4.3.1 The workers have the general duty of care for their own safety at work as well as for other members working nearby (Section 6B of the FIUO). Before conducting any work on lift/escalator, the worker should:-

- a) have understood the instructions and information provided by his immediate supervisors; understand his own duties in the works;
- b) inform his supervisor if he judges himself to be unfit or

incapable to carry out such works and terminate his work immediately;

- c) prepare and check his own tools and equipment; and report to his supervisor of any defects or abnormalities found;

4.3.2 The worker should attend any training or briefing sessions arranged by his proprietor/contractor.

4.3.3 The worker should carry out works in accordance with the instructions of his supervisor, and should follow closely the safe practices and any emergency procedures that have been set down.

4.3.4 The worker should maintain the Job Record Book up-to-date and containing the required specific information. He should sign every entry and ensure that it is countersigned by his supervisor.

# Training, Information and Instruction

[This section and the following sections 6 to 12 provide practical guidance on the requirements of Sections 6A and 6B of the FIUO.]

Under the general duties provisions of the FIUO, the proprietors or contractors engaging in lift/escalator works should, among other requirements, provide safety training, information and instruction to their employees. For example, training should be provided for the workers involved in safe manual handling operations or safe use of the lifting appliances and lifting gear for mechanical handling, and also for all workers on the proper usage and maintenance of the personal protective equipment. Refresher training should also be provided to them for the sake of maintaining their safety awareness and updating their knowledge on occupational safety and health. Safety information and instruction should be provided to the employees which include the hazards of the work, the information leading to safe manual handling operations, and other relevant information contained in the manufacturer's manual. Besides, changes in lift/escalator technology impose a need for the personnel being employed in the lift/escalator industry to receive appropriate additional training, information and instruction.

## 5.1 All Personnel

All personnel, including workers, supervisors and engineers, who might at any time be authorized by the proprietors or contractors to work on a lift/escalator installation should be instructed in appropriate basic safety procedures, including those recommended in this Code, and any other Code(s) produced by EMSD in this area. Also the information on appropriate first-aid treatment should be given to the worker, with practical training including in the event of receiving electric shock.

## 5.2 Engineers/Supervisors

In addition to the basic safety training as described in section 5.1 above, it is recommended that all the engineers/supervisors should receive further safety training relating to the hazards associated with the installation, thorough examination, inspection, testing, services/maintenance, repair, and dismantling of lifts/escalators and knowledge of safe working practices to be adopted to avoid those hazards, the statutory safety regulations, standards and codes [which include this Code and any other Code(s) produced by EMSD in this area]. Relevant safety instructions should also be provided to them.

### 6.1 Work Procedures

All the work carried out on lifts/escalators should be conducted by workers authorized by the proprietors or contractors. They should be strictly supervised and instructed clearly in the work to be performed and how it is to be done in a manner that is safe and without risk to health. Generally speaking, the instructions should be in the form of written procedures. However, concise and clear verbal instructions on the safe working procedures would be considered as adequate for some simple and repetitive tasks. These cater for the safety of the worker himself and other persons who might not involve in the actual work being undertaken on the lift/escalator.

### 6.2 Responsibility for Work on Site

One of the workers (probably a more senior and experienced one) authorized to perform work by the proprietor or contractor on a particular work site should be in charge of the work on site, including the safety aspect. He should have full knowledge of his duties and responsibilities and should identify clearly the lift/escalator or building owner or his representative to which the work is being carried out.

### 6.3 Well-being of Persons Working Alone

6.3.1 As far as practicable, workers should not be allowed to work alone on lifts or escalators in premises.

6.3.2 When it is unavoidable to have a worker working alone on a lift or escalator in occupied premises, special safety procedures should be adopted which include:-

- a) Before commencing work, any person working alone should make suitable arrangements to periodically confirm his continued well-being, especially when

working inside the well. Confirmation methods should in particular include one of the following:-

- i) confirmation by regularly calling to others who might be working in another part of the building by the worker working alone; or
  - ii) confirmation regularly with the person working alone via telephone or radio, such as mobile phone, walkie talkie, radio pager and etc. by the engineer/supervisor or a worker of other working team.
- b) Experienced engineers/supervisors should be assigned to check the well-being of those working alone and they should know how to organize assistance in the event of an emergency.
  - c) The actual arrangements and frequency for confirming a person's continued safety should be defined in the relevant safe working procedures [see section 6.1 above and item (i) of section 6.6.1(j) below].
  - d) Also, a worker/supervisor/engineer making site visits without any companion should beforehand inform other relevant persons of his proposed movements, itinerary, etc. during the periods.

#### 6.4 Communication

The site agent or client's representative should be informed and recorded on the log book whenever work is to be carried out on the lift/escalator. Communication channels should be established among the worker-in-charge on site as referred in section 6.2, the site agent, client's representatives, trade representatives and sub-contractors so that assistance can be sought in case of need. Besides, any special precautions or procedures needed to be taken in that particular work site can be made known to all persons involved.

#### 6.5 Record Keeping System

The technical data of the lift/escalator should be recorded in a register or file, drawn up once the lift/escalator is put into service. This register or file should be kept up-to-date and comprise of:-

6.5.1 a technical section indicating the technical data of the lift/escalator, including modifications or alterations. Layout drawings and wiring diagrams including amendments should also be attached; and

6.5.2 a section where inspection reports with dates, tests with observations as well as records of any accidents are kept.

This register or file should be available to those in charge of maintenance/repair and to the person or organisation performing the periodic inspections.

## 6.6 Site Safety Assessment

6.6.1 As an essence of a safe system of work for lift/escalator, an initial site safety assessment should be made to the work site by a person who is competent to do so before the commencement of every lift/escalator work. Such a person should preferably be a safety professional or an experienced engineer/supervisor, with adequate experience of safety and health at lift and escalator works. After making the assessment, the following should be identified and recorded as appropriate:-

- a) Safe means of access to and egress from each place of work should be provided [Regulation 38A of the CS(S)R]. For example, there should be safe access to/egress from the machine room and the lift shaft, etc.
- b) Rescue procedures and evacuation arrangements in case of fire, explosion, accident or other emergency situations, etc. occurring in any part of the building during the work should be provided.
- c) The make and type of lift/escalator, control system, the type of work to be carried out and other relevant information should be identified and recorded.
- d) The need for putting workers to work on live electrical equipment. If it is unavoidable, the safety precautions required to be carried out for such work.
- e) All dangerous parts of the machinery should be effectively guarded [Regulation 44 of the CS(S)R]. The anticipated removal of machine guardings during the work and the prompt re-instatement of those guardings after the completion of the work should be clearly specified.

- f) Arrangements for the use of communication equipment by the working personnel during the work should be made. Also, key words/signals to be used in the communication should be specified.
- g) Arrangements and procedures for safe manual handling operations which will be taking place during the work.
- h) For lift works:-
  - i. Safe spaces/clearances under the car in the pit and safe headroom above the car at the top of its travel should be ascertained. Relevant safety and warning signs should be displayed and other safety precautions should be considered if there are only limited spaces/clearances.
  - ii. The car top control station should be functioning properly. Especially, the effectiveness of those emergency stop switch and manual control mode switch should be checked.
  - iii. The car safety gear in electric lift or hydraulic rupture valve in hydraulic lift should be checked for their effectiveness if the working personnel are required to stand or travel on the car top.
  - iv. The car top should adequately support the anticipated loads, e.g. personnel and hand tools, etc.
  - v. The working conditions in the machine room, pulley room (if provided) and the lift well/pit should be assessed. For example, there should be adequate working space for the working personnel to manouvre especially when working at any electrical equipment where live conductors might be exposed during work. Environmental factors including temperature, ventilation, lighting and etc. inside the room and the lift well/pit should be suitable for working during different processes of work, such as the welding and cutting.
- i) For escalator works:-
  - i. Safe and easy ways and access routes with sufficient headroom to the machinery spaces should be provided.
  - ii. The enclosure and supporting structure should be sound and free from defects.

- iii. The handrail, steps, combs, drive for steps should be functioning properly. Besides, the braking system and the manual control and emergency stop switches should also be functioning properly.
  - iv. The protections against risks of overspeeding and unintentional reversal of the direction of travel should be checked for their effectiveness.
- j) After making the site safety assessment, a method statement should be provided and include in particular the following:-
- i. The way in which work would be performed, and the number/trade of working personnel involved in carrying out the work (including those from the subcontractors) should be stated clearly.
  - ii. The anticipated equipment required to perform the work including the use of lifting appliances and lifting gear for mechanical handling, and the arrangements made for it to be available at the appropriate time should be ascertained and provided.
  - iii. The availability and location of secure fencing, portable access ladders, personal protective equipment such as safety boots, safety helmets, safety goggles, safety gloves, safety harnesses/belts, secure anchorage, fittings for the safety harnesses/belts, independent lifelines and etc. should be ascertained and provided.
  - iv. The time and duration available for the work to be performed should be identified and recorded.
- k) The number of parties, and the respective timing, working on the same lift/escalator installation should be ascertained.
- l) Emergency procedures and facilities, including first aid, should always be made available for dealing with emergencies on site. Such facilities should be regularly maintained and upkeep properly.
- m) The safety and health management system for the control of the safety performance of the subcontractor(s), if any, should be effective and efficient. Reference can be made to “A guide to Construction Safety Management” issued by the Labour Department for

an example of such safety and health management system.

- n) The application of any of the relevant safety regulations should be identified and recorded. Compliance of those regulations should be checked.

6.6.2 Besides, subsequent periodic re-assessment of the site conditions should be made. For most of the time the appropriate frequency for carrying out this re-assessment would be decided by the person performing the initial assessment. Generally speaking, the following factors should be considered for determining the frequency: the nature of the task, the likelihood of changes in the working personnel, the equipment and the location of the work.

The interval decided should be specified and recorded at the initial assessment and any changes to it should be recorded. Also, any changes to the initial safety assessment after the re-assessment should be recorded as well.

6.6.3 When work is to be carried out for the braking assemblies of lifts and escalators, it is the responsibility of the proprietor or contractor to ensure that the work does not involve any asbestos-containing material, especially in the brake linings. Otherwise safety measures in accordance with the provisions under the Factories and Industrial Undertakings (Asbestos) Regulation should be taken.

6.6.4 When work is to be carried out in certain work sites which are subjected to special regulations and working practices, e.g. power stations, gas installations, marine installations, container terminals and chemical works, additional safety requirements or permit to work systems might be required as agreed with the site management.

6.6.5 The safety of working personnel engaged in other activities within the working area should also be considered in the site safety assessment.

## 7.1 Working at Height

7.1.1 Where work cannot be safely carried out on the ground, from any part of a building or other permanent structure, suitable scaffolds with proper working platform(s) should be provided for working personnel [Regulation 38B of the CS(S)R]. The Code of Practice for Scaffolding issued by the Commissioner for Labour provides practical guidance on the construction and maintenance of bamboo or metal scaffolds.

7.1.2 In particular, the following should be adopted on safe erection, use and dismantling of metal scaffolds:-

- a) A method statement should be prepared by a professional engineer before commencing metal scaffolding erection. The method statement should include the following:-
  - i. layout, support details and construction details of the metal scaffold (so that all concerned know what are to be erected and what are to be controlled);
  - ii. justifications on the strength and stability of the scaffolding components during erection, use and dismantling;
  - iii. sequence of erection and dismantling; and
  - iv. standards of materials and workmanship.
- b) The professional engineer as mentioned in (a) above should have adequate training and practical experience to make decisions on whether the loads on the scaffold or on the supports can be resisted safely without undue movements.
- c) The method statement for metal scaffolds supported by fastenings (or anchors) to concrete or masonry should be checked by a qualified engineer of the structural discipline or equivalent.

7.1.3 For lift renovation works in occupied buildings, any scaffold utilized inside the lift well should be of non-combustible type. For illustration purpose, figure in Appendix II illustrates a typical metal scaffold with suitable working platforms erected inside a lift well.

7.1.4 The provision of a safe place of work or a platform for the persons working on lift/escalators should always be the first choice. If this is impracticable and there is a risk for a person working in the lift well, the escalator wellway or any other places to fall more than 2 m, a suitable safety net should be erected or the person should wear a safety harness/belt with suitable lanyard securely attached to an independent lifeline or an anchorage as an alternative [Regulation 38Q of the CS(S)R].

7.1.5 The use of safety nets would be a better alternative than the use of safety harnesses in certain instances. Some of the examples are as follows:-

- a) where many workers working in one location, or
- b) where large open areas or long loading edges expose workers to height hazards and the use of safety harness is deemed impractical or not feasible for the work method.

The work of erecting and dismantling safety nets should be carefully planned and supervised and only undertaken by competent working personnel.

7.1.6 Safety nets should be fitted as close to the working surface as possible, and in no case further below than the maximum distance marked on the label attached to the net which would be either 1m or 6m. The gap between a net and the building should be as close as practicable but in no case should this be more than 200 mm.

7.1.7 Safety nets should not be stretched taut when erected, but should have an initial sag of between a quarter to a fifth of the length of the shortest side of the net.

7.1.8 Safety net will deflect when arresting a falling body and requires a minimum clearance below. The clearance should be equal to two-thirds of the length of the shortest side or 2 m minimum in order to prevent the contact with any surfaces or structures below.

7.1.9 Members supporting the safety net should be adequate in both the horizontal and vertical directions at the net perimeter to resist the downward fall.

- 7.1.10 A safety net must be inspected at regular intervals and after any fall. Test cords included in the net should be regularly tested in accordance with the recommendations made by reputable national or international standards. An example of such standard is appended in Appendix III.
- 7.1.11 The use of safety harnesses are preferred to the safety belts. The anchorage points should be as high as possible above the working position in order to limit the height of any fall. In some work activities, inertia reel may also be used.
- 7.1.12 Safety harnesses/belts should be worn and fitted correctly. They should be regularly inspected and maintained in good serviceable condition in accordance with the manufacturers' instructions. A typical use of safety harness/belt and independent lifeline for working personnel by the industry is shown in Appendix IV.
- 7.1.13 In using safety harness or belt, appropriate anchorage and suitable standards of safety harness/belt of national or international standards should be adopted. An example of acceptable standards is appended in Appendix III for reference.

## 7.2 Manual Handling

After carrying out the site safety assessment as per section 6.6, the proprietor/contractor should as far as reasonably practicable, avoid the need for workers to undertake any manual handling operations which may create safety and health risks. If it is not reasonably practicable, a further assessment should be made of the risks to the safety and health of those workers having regard to the tasks, the loads, the working environment, individual capability and etc. In addition, appropriate steps should be taken to reduce the risks to the workers who undertake the manual handling operations and arrangements for the preventive and protective measures should also be made by the proprietor/contractor and, if necessary, assisted by a person who is competent in carrying out the measures. Nevertheless, the safe manual handling practices should contain, as a minimum, the following elements prior to carrying out any manual handling works:-

- 7.2.1 Preparation of work;
- 7.2.2 Safe manual lifting procedures; and
- 7.2.3 Procedures for lifting large size or heavy loads.

7.2.1 Preparation of work:-

- a) If the actual weight of the load to be handled is not known, a rough estimate of the weight is to be made. When the load is heavy or bulky in size, assistance for additional manpower should be sought or suitable mechanical equipment such as hoist, jack, crane, forklift truck etc. should be used instead.
- b) Appropriate gloves should be worn if sharp edges, projecting nails, wire or splinters are found in the load to be lifted.
- c) Handles or holders should be used if possible in order to reduce the chance of getting fingers pinched or smashed.
- d) Steel-cap safety shoes should be worn when handling heavy loads.
- e) The manual handling work should be planned beforehand. Any obstructions in the path of handling should be removed. The load should either be seen over or around during handling at all time and there should be ample space for unloading it.

7.2.2 Safe manual lifting procedures:-

- a) The worker doing the lifting work should attend close to the load with feet slightly apart and with one foot a little advance of the other, pointing in the direction he intends to move.
- b) The worker should then tuck his chin in and bend his knees whilst keeping his back straight.
- c) He should pull his elbow as close to his body as possible and grip the article using his palms and roots of the fingers.
- d) Afterwards, he should raise his head up and look in the direction he intends to go.
- e) Finally the worker should straighten his knees using the thigh muscles rather than his back to lift the load. When the load is lifted and set, he can move on.

- f) If necessary, lifting can be carried out in several stages, i.e. from floor to knee, then from knee to the carrying position.
- g) The lifting method should be reversed when the load is set at the destination.
- h) The worker should not try to change his grip while carrying load.

### 7.2.3 Procedures for lifting large size or heavy loads:-

- a) When the size or the weight of any load is beyond the capability of a single person, the load should be handled by a team. A leader should be assigned to be completely in-charge of and solely responsible for the safe completion of the task. The leader should not take part in the actual lifting if possible.
- b) The leader should inform the lifting party of what the job involves and how it is to be done.
- c) He should ensure that the route is free from obstructions and the floor has secure footholds.
- d) Proper protective clothing should be worn by the lifting personnel.
- e) The leader should ensure that the load is evenly distributed to the party and check that they all have a secure grip.
- f) He should take up a position which gives an overall view.
- g) He should coordinate the lifting and moving efforts.
- h) He should keep a good all-round lookout for the development of any potentially hazardous situation.
- i) He should finally ensure that any equipment used in the operation is returned to its proper location afterwards.

## 7.3 Mechanical Lifting

7.3.1 In carrying out the lift or escalator work, the mechanical handling involved most frequently is the raising and lowering of equipment, parts and materials. The lifting operation should follow the legal requirements stipulated in the FIU(LALG)R and the CS(S)R.

7.3.2 Any lifting appliances and lifting gears used in the operation should be properly constructed and securely supported during the operation [Regulations 4 and 7D of the FIU(LALG)R].

- 7.3.3 The lifting appliances and lifting gears should be properly maintained, regularly tested, thoroughly examined and inspected as required in Regulations 5, 6A, 7A and 18 of the FIU(LALG)R.
- 7.3.4 For a crane that requires the provision of an automatic safe load indicator (ASLI), the ASLI should be functioning properly, and inspected and tested by a competent examiner [Regulation 7B of the FIU(LALG)R].
- 7.3.5 When a lifting appliance is used at or moved in the work site, its stability during operation should be considered by taking appropriate safety precautions, i.e. spreading the load, reinforcing the supports, etc. where the situation warrants [Regulation 7D of the FIU(LALG)R].
- 7.3.6 The safe working load of the lifting appliances and gears should be clearly identified and marked [Regulations 11 and 18 of the FIU(LALG)R]. Loading diagram if applicable should be provided in a conspicuous position for the worker to observe.
- 7.3.7 The load to be handled should be securely fastened in order to prevent any undesired movement or falling of the load [Regulation 7J of the FIU(LALG)R].
- 7.3.8 The erection, dismantling or alteration of the lifting appliance should only be conducted under the supervision of a competent person [Regulation 7H of the FIU(LALG)R].
- 7.3.9 The operator of a crane should be at least 18 years old, competent to operate the crane and holder of a valid certificate [Regulation 15A of the FIU(LALG)R].
- 7.3.10 The operator of a power-driven lifting appliance, other than a crane, should be at least 18 years old and is trained and competent to operate the appliance [Regulation 15A of the FIU(LALG)R].
- 7.3.11 A makeshift hook, damaged hook or a hook with a defective safety latch or catch should never be used.
- 7.3.12 The load should be hooked to the lifting block by clamp or through the loops of the sling. The end links, rings or shackles should be riding freely on the hook.

- 7.3.13 The slings should be protected from sharp edges damage by using soft packing.
- 7.3.14 A chain should not be shortened by tying knots in them [Regulation 18 of the FIU(LALG)R]. Wire ropes should not contain kink or twist.
- 7.3.15 Lifting block should never be dropped from a height or dragged under a load.
- 7.3.16 Before mounting any lifting gear from a point provided in the building, a beam or a girder, the lifting gear together with the building, a beam or a girder on which it is to be mounted should be checked to ensure it can withstand the load.
- 7.3.17 The operator should be familiar with the lifting appliance he is using. He should understand which direction the chain/rope should be pulled in order to raise or lower.
- 7.3.18 Warning to others in the vicinity should be given when the load is about to be lifted.
- 7.3.19 The load should be positioned directly under the lifting appliance to prevent swinging during lifting.
- 7.3.20 When the load is just lifting off the ground, it should be raised slowly and steadily. Stability should also be checked during such operation and sufficient space should be provided prior to unloading.
- 7.3.21 The load should not be allowed to revolve as this may cause the eyebolt to become loosened.
- 7.3.22 Nobody should work or stand below the path or within the swing radius or locus of the suspended load during the lifting operation.
- 7.4 Fire Prevention
  - 7.4.1 Prior to the commencement of any lift/escalator work, workers should be informed about the emergency arrangements in case of fire. The arrangements include the method of sounding the fire alarm, informing the Police and Fire Services Department, leaving via the means of escape from the work site and etc.

- 7.4.2 The fire exit(s) and escape route(s) in case of emergency or fire should be clearly identified and indicated at the workplace. These exit(s) and route(s) should be kept free from obstructions and adequate lighting should always be provided and maintained for the exit(s)/route(s). All working personnel in the workplace should get familiar with such exit(s)/route(s).
- 7.4.3 A fire watch should be provided for the hot work process to make sure fires do not start.
- 7.4.4 No worker should be allowed to smoke while lift/escalator works are being carried out.
- 7.4.5 Sufficient number and correct type of fire extinguishers should be available at suitable work locations.
- 7.4.6 Flammable substances should be stored in a safe location and in suitable containers with secured lids and proper labels. All such containers containing flammable substances are required to be labelled in accordance with the Factories and Industrial Undertakings (Dangerous Substances) Regulations [FIU(DS)R]. The containers should be housed in a non-combustible cupboard or bin. Supervisor should be informed immediately for remedial action if any leakage of flammable liquid is detected.
- 7.4.7 Adhesives and solvents giving off flammable or harmful vapour should never be used in restrictive space without adequate ventilation or close to an ignition/heat source.
- 7.4.8 Oily rags and rubbish in the pits or on the top of the lift cars should be cleaned up before any work is to be carried out. Furthermore, they should be removed from the work site regularly, preferably on daily basis.

## 7.5 Welding and Cutting

Whenever welding or cutting work is carried out, basic safety precautions to be taken should in particular include the following:-

### 7.5.1 General safety precautions

- a) Before starting to weld, all the floors should be swept clean and the wooden flooring if any should be covered

with sheets of fire retarding material or other suitable alternatives. Flammable substances should be removed from the vicinity of the work site where welding/cutting work is carried out.

- b) All the combustible materials should be moved to a safe place, or covered with fire retarding material.
- c) A fire watch should be provided to make sure fires do not start. At the same time, suitable and adequate numbers of fire extinguishers or buckets of sand should be made readily available.
- d) Adequate measures should be taken to prevent sparks, flaming or hot debris arising in the process of welding or cutting from falling onto any person or combustible substances in the vicinity or down below the work site, hereby causing injury or starting a fire.
- e) Ventilation should be provided in order to maintain adequate fresh air for the workers during welding and cutting especially in restrictive spaces. Fresh air should be provided to the working area from a clean environment. As far as reasonably practicable, effective local exhaust for the welding or cutting process should be provided and maintained in the lift well to remove any hazardous fumes generated. The local exhaust should be installed as close as possible to the point of welding or cutting for effective fumes removal.
- f) Workers should never wear oil-stained clothing when they are carrying out the welding and cutting work.
- g) For gas welding work, lighted oxy-acetylene torches should always be held. For manual electric arc welding work, a safe space should be selected for resting a live electrode holder to avoid accidental striking of electric arc.
- h) Welding or cutting in old lift well where equipment is covered with oil or lint should be avoided as far as reasonably practicable. If welding or cutting has to be done, appropriate safety measures should be taken so as to prevent accidental ignition of the combustible oil or lint during the process.

#### 7.5.2 Gas welding/cutting

- a) Gas cylinders should be transported and used in a

trolley or stand made for the purpose. When in use, all gas cylinders should stand alone and be kept in the upright position. Valve handles or valve wrenches should be retained in place while the cylinders are in use. In regards to the quantity of compressed or flammable gas allowed in a work site, the provisions in the Dangerous Goods Ordinance (Cap.295) should be observed.

- b) Cylinders should not be subjected to rough usage, excessive shock or high temperature.
- c) Cylinders under storage in the work site should not be stacked too high or under heavy weights.
- d) Cylinders should never be stored in places where grease or oil is likely to make contact with the valves or gas connections. Also grease or oil should never be used on valve fittings and threads.
- e) All gas connections should be checked for leaks.
- f) Gauges and torches should be protected from damage.
- g) Regulator and flash back arrestor should be used.
- h) Oxygen should not be used to blow out or clean equipment.
- i) Cylinder caps should be in place wherever cylinders are not in use, or while they are in storage.
- j) Care should be taken that hose not to become kinked or tangled, or be stepped on, run over or otherwise damaged. Before operation, a worker should be assigned to inspect the gas hose for any physical damage that may lead to gas leakage, and report to the supervisor if damage is detected.
- k) Torches should be lit with friction lighters, stationary pilot flames or other safe source but not with matches, cigarette lighter or other inappropriate ignition device.
- l) The key-operated cylinder valve should be kept closed and the pressure from the hoses should be relieved when not in use.
- m) Eye protectors of the type approved under the Factories and Industrial Undertakings (Protection of Eyes) Regulations [FIU(PE)R] should be provided and worn/ used by all personnel involved.

- n) Gas cylinders should never be placed on the car top, inside the lift well/pit, inside the car or other places inside the truss of the escalator.

### 7.5.3 Electric arc welding/cutting

- a) Approved eye filter in the face shield or other approved eye protectors of the type approved under the FIU(PE)R should be provided and worn/used by all personnel involved [Regulation 5 of the FIU(PE)R].
- b) A screen to protect other employees and persons in the vicinity from ultra violet and other harmful radiation emitted during electric arc welding/cutting should be provided [Regulation 6 of the FIU(PE)R].
- c) Suitable gloves, overalls, etc. should be worn to cover the skin of the workers involved in the process.
- d) Eye protection should be provided to protect the eyes when doing chipping work to remove weld scale arising from the welding process.
- e) Molten and red hot metal debris would be created during welding, and in particular during cutting. It would impose fire hazard and also endanger the workers below the welding/cutting site. In this respect, proper measures, such as fixing a collection trough (made up of fire retarding materials) below the welding/cutting locations to collect and hold the sparks, weld splatters and molten droplets, etc. should be implemented as far as practicable.
- f) Spent electrodes are still hot and they should be put in a proper container to prevent fire, getting underfoot or falling on working personnel below.
- g) The exposed metal parts including the iron core of the welding transformer and the welding workpiece should be properly and effectively earthed.
- h) The welding transformer should be completed with an earthed metal casing for protection against damage and weathering. The use of open-type welding transformer should be avoided. For enhanced safety, the welding transformer should incorporate electric shock-preventing device.
- i) The welding transformer should not be placed on the

car top, inside the lift well/pit or inside the car or the truss of the escalator.

- j) Cables and cable connectors used in arc-welding circuits should be effectively insulated (Regulations 6 and 9 of the Factories and Industrial Undertakings (Electricity) Regulations [FIU(E)R]). Only cables of adequate current carrying capacity should be used. To eliminate fire hazard, dedicated welding return cable of appropriate type and size must be used for welding/cutting. The use of the steel guide rails or other steelworks and metal parts as the welding return is forbidden.
- k) Electrode holders should have adequate current carrying capacity and be adequately insulated to prevent shock, short circuiting or flashovers.
- l) There would be inherent risk of getting in touch with exposed live conductive parts, e.g. the welding electrode, the electrode holder, etc. during electric arc welding/cutting, in particular in restrictive workplaces having conductive metal parts/steelworks around. To reduce the risk of getting an electric shock, endeavours should be made to keep the electrical resistance of any possible leakage current path high by keeping the workplace, clothing and body of the workers always dry. The workers should preferably also wear rubber boots. The welding voltage should also be kept to a safe minimum (i.e. below 50V a.c.).
- m) The car top and the lift well/pit are restrictive workplaces. Extra care has to be taken when carrying out electric arc welding work in those locations to minimize the risk of getting electric shock or burns.
- n) The welding equipment should be switched off when not in use and when it is left unattended.

## 7.6 Rope Socketing

- 7.6.1 Rope socketing for termination of wire rope are commonly used in the suspension of lift car or counterweight. When preparing rope sockets, suitable protective face shields and protective gloves should be worn when pouring babbitt which basically contains lead and tin.

- 7.6.2 The bearing housing or shackle, etc. to be poured should be preheated to ensure that it is dry enough. It is because the presence of moisture will form captured steam and the hot babbitt may explode during the socketing process.
- 7.6.3 During the process, breathing in of the fumes should be avoided. Adequate mechanical extraction system should be provided and maintained at the pouring site to remove the harmful fume. Furthermore, suitable respiratory protective equipment should be worn by the working personnel.
- 7.6.4 Naked flame process to heat up and molten the babbitt should be avoided. Otherwise, adequate fire safety precautions should be made and they should in particular include:-
- a) the place where the naked flame process is to be conducted should be kept clear of combustible materials;
  - b) inflammable substances including fuel in excess of exempted quantity should not be used. They should be stored in suitable closed containers and the containers should be kept in a metal cupboard or bin; and the metal cupboard or bin should be situated in a position where it is least likely that the inflammable substances will catch fire;
  - c) every container used for storing of inflammable substances should be properly labeled in English and Chinese [Regulations 5, 6 and 9 of the FIU(DS)R];
  - d) adequate fire fighting equipment such as suitable fire extinguishers should be made readily available;
  - e) adequate ventilation should be provided during the process.
- 7.6.5 Working personnel after handling babbitt should wash their hands thoroughly prior to eating or smoking. It is preferable for the clothing of the working personnel be replaced too.
- 7.6.6 Care should be taken when using resins instead of babbitt for socketing. Only the heaters recommended by the resins manufacturer (e.g. silicone rubber heaters) should be used for curing of resins. The resins should not be

allowed to come in contact with the exposed skin during the resin socketing work. Besides, the resins should not be stored in direct sunlight.

7.6.7 Recovery of babbitt or resin socketed bearing housings, shackles and fittings should follow similar safety precautions as described above.

7.6.8 Care should be exercised to prevent scalding or burns to the exposed skin of the working personnel during the handling of the recovered bearing housing, shackle or fitting which may still be hot.

## 7.7 Environment

7.7.1 The generation of harmful/toxic fumes or excessive noise in the restrictive spaces is often experienced during lift and escalator work. This kind of situation should be avoided wherever possible. If it becomes impracticable, engineering control measures such as the provision of artificial ventilation and local exhaust ventilation for removal of harmful/toxic fumes, or the provision of appropriate noise reduction enclosure to minimize the noise emanated should be implemented. As a last resort, personal protective equipment should be worn and/or used by the workers as appropriate.

7.7.2 Appropriate illumination level should be provided and maintained at the workplace for the sake of safety and health of the lift/escalator workers. Excessive or inadequate illumination level would both pose risk at work. The appropriate level of illumination would depend on delicacy of the work involved. Besides, the colour rendering of lighting is also a factor to be considered by the proprietor/contractor.

## 7.8 Protective Equipment

All working personnel should wear suitable protective clothing, preferably one-piece overalls. Personal protective equipment such as safety helmets, safety gloves, hearing protectors, eye protectors, respirators, safety shoes and safety harnesses/belts (with secure anchorage or independent lifeline provided) should be provided to all working personnel in the work site where appropriate. All

working personnel should use and/or wear the personal protective equipment so provided. All the personal protective equipment and protective clothing should be maintained in an efficient and serviceable state and replaced as necessary. The personal protective equipment should be appropriate for the nature of hazards and offer sufficient protection against the hazards. Training should be provided for the workers in when, why and how to use the personal protective equipment.

#### 7.9 Display of Warning Signs/Notices

During installation or maintenance work for lifts/escalators, safety signs/notices (both in Chinese/English) should be provided for working personnel to display prominently on all landings, machine room or the entrances of the lifts/escalators, etc. before commencing work to warn others that lift/escalator installation or maintenance work is in progress so that disturbances by others posing hazard to the lift/escalator workers would be avoided or at least kept to a minimum.

### 8.1 Tools and Equipment

- 8.1.1 The correct tools and equipment should only be used for their intended purposes. They should be cleaned, maintained and inspected each time before use.
- 8.1.2 Hand tools should be stored and carried in boxes or in tool-bags. Tool boxes should be placed in proper locations so that other person may not trip over them.
- 8.1.3 Pliers and pipe wrenches should not be used on bolts and nuts. Makeshift handle extensions to increase the mechanical advantage should not be used.
- 8.1.4 Crescent wrenches are universal tools made for rough work; proper wrench should be used as far as possible.
- 8.1.5 Crowbar required for manual handling should be of correct size. A block of wood should be placed under the head of the crowbar for leverage.
- 8.1.6 Hardened steel surface should never be struck by a steel hammer; a plastic, wood or soft metal hammer should be used instead.
- 8.1.7 Any knife for the job should be sharp and carried in a sheath or holder. A knife should not be used in place of a cable stripper for stripping cable.
- 8.1.8 Split or loose handles of any tools should be replaced with new ones. Handles should not be wired or taped.
- 8.1.9 Screwdrivers should always be properly dressed and their handles should be in good condition.
- 8.1.10 A screwdriver should not be used as a punch, wedge, pry, or chisel.
- 8.1.11 Files should not be used unless they have a proper handle, and should not be used as a pry.
- 8.1.12 Chisels, center punches, etc. should be dressed to eliminate mushrooming.
- 8.1.13 The correct drill bits should be used for percussion drilling.

8.1.14 For use of portable power tools or lighting, the following should be observed:-

- a) Defective power tools should be returned and properly repaired.
- b) Equipment should only be used at its rated supply voltage.
- c) A plug of different specifications should never be forced into an unmatched socket.
- d) The lead should be in good working condition, free from cuts or chaffing, and of sufficient length for the job.
- e) The leads should be properly routed and laid to protect against damage.
- f) Extra-low supplies (e.g. 110 volts output transformer with secondary winding earthed at the centre-point) should be utilized as far as practicable for all portable power tools to reduce the risk of electric shock. All power tools to be used should preferably be “double-insulated” tools. This requirement should be particularly noted when working on car top, lift well, inside lift car or any other restrictive spaces where rescue or evacuation in case of emergency may pose some difficulties.
- g) Inspecting lamp should be either ‘double-insulated’ or ‘all insulated’ type. The lamp bulb should be guarded with non-conductive materials against accidental breakage. The lamp should not be suspended by its electric cord.
- h) Proper type of plugs and sockets should be used for power connection.
- i) Power extension cables should never be hung over nails or be left in places where they can get damaged or wet. The cables should not be lifted or pulled by the electrical connection leads and they should be coiled when not in use.
- j) An electric tool without an earth connecting wire connected to an effective earth should never be used (except for ‘double-insulated’ type).
- k) Other contractor’s equipment of which the worker has little knowledge, should not be used unless authorized by the respective owner and also the proprietor/contractor of the lift/escalator worker to do so.

8.1.15 For the use of cartridge-operated fixing tools, the requirements stipulated in the Factories and Industrial Undertakings (Cartridge-Operated Fixing Tools) Regulations should be observed.

## 8.2 Portable Ladders

8.2.1 A ladder or a folding step-ladder should be of good construction, made of suitable and sound material, and of adequate strength for the purpose. The ladder should be properly maintained [Regulation 38O of the CS(S)R].

8.2.2 Metal ladders equipped with metal safety feet should not be used because they are electrical conductors and would make the worker standing on it vulnerable to electric shock if it becomes live accidentally.

8.2.3 Ladders should be examined for defects before every use. Ladders with any of their rungs defective or missing should not be used [Regulation 38O of the CS(S)R].

8.2.4 Ladders should never be painted.

8.2.5 While working on a ladder, reaching more than an arm's length should be avoided.

8.2.6 Only ladders of sufficient length should be used. Adding makeshift extensions is dangerous and should be prohibited.

8.2.7 Ladders should be placed so that the distance between the bottom of the ladder and the supporting structure is at least one-fourth of the supported vertical height of the ladder.

8.2.8 When a ladder is used for ascending or descending from one level to another, the ladder top should extend at least 1 m above the landing served.

8.2.9 Ladder standing on a base should not be used unless it is securely fixed to its upper resting place. In the case that such a fixing is impracticable, the ladder should be securely fixed at or near its lower end [Regulation 38O of the CS(S)R].

8.2.10 Ladder standing on a base such as loose bricks or other loose packing should not be used. Only ladder which has a level and firm footing should be used [Regulation 38O of the CS(S)R].

- 8.2.11 Ladder should be secured where necessary to prevent undue swaying or sagging. It should also be equally and properly supported on each stile or side [Regulation 38O of the CS(S)R].
- 8.2.12 Where it is impracticable to securely fix a ladder standing on a base, a worker should be stationed at the foot of the ladder when in use to prevent it from slipping [Regulation 38O of the CS(S)R].
- 8.2.13 When a ladder is being used in a location where it may be struck by others in the area, there should be a second person at the bottom of the ladder at all times. Also, ladders should never be left in such locations when not in use.
- 8.2.14 Whenever it is necessary to place a ladder in front of a door opening, the door should be temporarily blocked, locked or guarded by a second person.
- 8.2.15 When ladders are placed in an aisle or corridor, the area should be fenced off.
- 8.2.16 When climbing up and down the ladder, the worker should face the ladder and use both hands. Small articles such as hand tools should be carried in pockets or belt; and large articles should be raised or lowered by a handline.
- 8.2.17 Extension ladders should not be taken apart to make two ladders unless each section is equipped with safety feet.
- 8.2.18 Step ladders should be used properly in their fully open position
- 8.3 General Electrical Safety
  - 8.3.1 When the casing of the electrical equipment is dismantled for repair, alteration or examination, the switches should be locked and tagged out.
  - 8.3.2 No worker should stand on metal or in water to work on any electrical circuits. A worker should always avoid working on live electrical equipment. He should first switch off the power supply to the equipment before starting to work. The equipment should be thoroughly checked and tested in an off condition to verify that it is electrically sound before switching on the power supply.

- 8.3.3 In exceptional situation that it has to work on live electrical equipment, the following special precautions should be taken:-
- a) work should only be carried out by competent personnel;
  - b) working alone is not recommended;
  - c) sufficient guidance/warnings and supervision should be given to the workers; and
  - d) suitable protective overalls and electrical insulation gloves/shoes should be provided to and worn by the workers, and suitable electrical insulation mats should be made available for them to stand on during the work.
- 8.3.4 Suitable meters/testing instrument should be used for electrical measurement and testing.
- 8.3.5 Extreme caution should be exercised when working around electrical equipment of lift/escalator system because voltage actually existing in some parts of the system may be considerably higher than that indicated for incoming power lines. Reference to the updated drawings and maintenance manuals should be made.
- 8.3.6 When working around or checking motor-generator sets, lift motors and solid state motor drives, extreme caution should be taken because the armature voltage present may be very high.
- 8.3.7 a) In general, when jumpers are used for bypassed operation, they should be easily removable, properly made, of a conspicuous colour and sufficiently long. After completion of the work on the lift, all the jumpers should be removed and counted for before returning the equipment to service.
- b) When landing door safety circuit has to be bypassed, the requirements in the EMSD's Code of Practice on the Design and Construction of Lifts and Escalators (Clause 10.3.1.8, Part 1, Section E) regarding "landing door lock bypassed operation" should be followed.
- 8.3.8 Extreme caution should be exercised when working on systems for multi-car operations because there may still be energized parts, in particular, in the control system even when the power main switch for the lift car's motor drive has been opened.

- 8.3.9 Fuses and fuse holders should be of proper size and properly labelled. Fuse should not be by-passed nor shunted.
- 8.3.10 When temporary wiring is used, the wiring should be properly fixed and be located in such a manner that none can trip over it. Besides, precautions should be taken to protect the temporary wiring from sharp edges and mechanical damage.
- 8.3.11 Fuse pullers should be used for removing fuses and the power supply should be disconnected when fixing or removing fuses.
- 8.3.12 A thorough check of all electrical control and starting devices should be made before beginning work on any rotating machine. The circuit breakers or switches should be locked out and the fuses be removed as appropriate, in particular for equipment which is remote controlled.
- 8.3.13 When working on circuits containing capacitors, any stored energy should be properly discharged beforehand.
- 8.3.14 For the purpose of preventing electric shock, precautions should be taken to keep the body, tool and equipment from accidental touching of any live parts of control boards, moving machine parts, or connections.
- 8.3.15 When using power extension cables, the cable should be plugged into a socket outlet which is capable of carrying the expected load and is provided with an effective earth.
- 8.3.16 Working spaces, walkways and similar locations should be kept clear of electric cords so as not to create a hazard to workers or subject the cords to damage.
- 8.3.17 Objects such as tools, oil cans, nuts, bolts, and washers should be kept clear of field magnets of rotating electrical machines to prevent them from being drawn into the moving parts.
- 8.3.18 Adequate lighting should be maintained for the work, in particular for working in dark area.
- 8.3.19 All portable electric tools/apparatus should have all their flexible wires connected to the system either by effective permanent joints or by properly constructed connectors [Regulation 14 of the FIU(E)R].

8.3.20 All portable electric apparatus/tools operating at a voltage exceeding extra low voltage (i.e. voltage greater than 50 volts a.c. or 120 volts d.c. between any two conductors or a conductor to earth) should be protected against leakage to earth of current liable to cause electrical hazard. They should be controlled by efficient means suitably located so as to permit ready operation for cutting off all voltage in case of need [Regulation 14 of the FIU(E)R]. Residual circuit breakers should be provided at the power supply source supplying electricity to the work site to provide enhanced protection against electric shock.

## Working on Lifts

- 9.1 General Safety Practices for Working on Lifts
- 9.1.1 In carrying out the lift work, the specific safety practices and recommendations made by the lift manufacturers should be strictly adhered to. There should be no passenger inside the lift car and the lift car should always be kept in the closed position, except when workers are working inside.
- 9.1.2 Adequate lighting for the works should be provided. It should be ensured by the workers together with the safe refuge area provided prior to entering any pit or car top. For emergency purpose, portable torches or emergency lights (battery-operated) should be provided to workers working inside the lift well.
- 9.1.3 The lift should be made inoperative and locked out before any inspection, cleaning, oiling or lubrication of wire ropes and moving parts. Lift car should be blocked to prevent any downward movement prior to removing any hanging cables or repairing any support system of an electric/hydraulic lift.
- 9.1.4 When more than one lift is installed within a common lift shaft, a partition of appropriate height should where practicable be provided between adjacent lifts to prevent trapping hazards. The requirement of the partition as specified in the Code of Practice on the Design and Construction of Buildings and Building Works for the Installation and Safe Use of Lifts and Escalators (Clause 3.7.1 and 3.7.2) issued by Buildings Department should be followed.
- 9.1.5 If it is necessary to gain access into the lift well, a safe means of access and egress should be clearly provided before entering and the means should be readily accessible from the workplaces.

- 9.1.6 The number of persons working within a lift shaft at the same time should be kept to a minimum. The simultaneous employment of different tradesmen working independently of each other should be avoided if possible.
  - 9.1.7 Any items of equipment for dismantling should be lowered under control and should not be dropped down under all circumstances.
  - 9.1.8 Protection guard should be reinstated as soon as the maintenance work for the dangerous part of any machinery is finished.
  - 9.1.9 A lift should not be returned to normal operation when the work is finished unless it has been ascertained that there is no person, tools, access equipment, etc. in the lift well. All equipment and facilities for maintenance, service or installation work, e.g. propping device, should be returned to their proper positions.
  - 9.1.10 For the safety sake of the workers carrying out work for installation, the installation manuals and the up-dated shop drawings, such as the plant layout, equipment arrangement, wiring diagrams, etc. shall be properly kept and be referred to at the workplace.
  - 9.1.11 Regarding the operation and maintenance of a lift/ escalator installation, the operation and maintenance manuals, operation/maintenance log books, working procedures, checklists, etc. are essential elements of the hardware of a safe system of work. Together with the as-built diagrams, including the electrical wiring diagrams, hydraulic circuit diagrams, process flow charts, etc., they should be properly kept at the work site and be referred to by all workers for safety sake.
- 9.2 Safety Practices for Working on Car Top
- 9.2.1 A car top stopping device should be positioned within 1 m of the landing threshold and capable of being operated from the landing. The normal lift control circuit should be positively isolated before any worker attempts to gain access to the car top from the landing.

- 9.2.2 Where headroom above the lift car is less than the current standard requirement or may only accommodate one person, a warning sign should be displayed in a prominent position close to the car top control station.
- 9.2.3 Guard rails of 900 mm to 1150 mm in height should be provided on the car top where the worker may fall via the gap between the lift and the well enclosure. Such guard rails should be sufficiently strong and secure [Regulation 38P of the CS(S)R].
- 9.2.4 Appropriate safety sign and notice should be displayed in a prominent position on the car top if the lift installation is without any car safety gear or a hydraulic rupture valve to alert the workers.
- 9.2.5 Positive means should be provided to interrupt the normal control circuit for preventing car movement when the car landing doors are kept in an opening position for the purpose of the lift work.
- 9.2.6 The car top control should be inspected and checked for its effectiveness before any work on the car top commences.
- 9.2.7 The number of persons allowed on the car top at any one time should be kept to the minimum. They should stand clear away from any moving rope, sheaves or other moving objects. Special care should be taken where the car tops are curved or domed.
- 9.2.8 One and only one person should be appointed to take the sole control of the car movement when workers work on the car top. All persons travelling on the car top should fully understand the procedures adopted for activating the car movement. Regarding the safety of the lift car, the requirements of relevant legislation and Codes of Practice administered by EMSD should be followed.
- 9.2.9 The car top should be clean, free from oil and grease and structurally sound. Standing on the emergency exit cover of the lift car is prohibited. The car top should be cleared up and cleaned before leaving it after the work.

- 9.2.10 The working personnel should be able to hold firmly on the crosshead or other rigid parts of the car structure when the car is moving. Holding any wire rope by a worker may result in serious injury and therefore is prohibited.
- 9.2.11 If there is an adjacent lift in the same lift well, the worker should avoid contacting with any counterweights and keep within the limits of his lift especially when the car is moving.
- 9.2.12 As a general rule, the car top should be accessed from the top terminal landing.
- 9.3 Safety Practices for Working below a Lift Car
  - 9.3.1 Before entering a lift pit, the stopping devices of the lift should be tested for their effectiveness.
  - 9.3.2 If there is no direct access door to the lift pit, suitable safe means with hand holds of access to the pit should be provided from the lowest landing entrance.
  - 9.3.3 When working below a car with restrictive space which can accommodate only one person, appropriate restraint device for the lift car should be properly installed prior to gaining access into the pit.
  - 9.3.4 Counterweight screen of an appropriate height above the pit floor should be provided to avoid hazards created by descending counterweight. The requirements for the height of the screen as stipulated in the EMSD's Code of Practice on the Design and Construction of Lifts and Escalators (Clause 4.17.4, Part 1, Section E) should be followed.
  - 9.3.5 Worker should activate the pit-stop switch to prevent any movement of the car before entering the lift pit.
  - 9.3.6 No worker should enter or work in a lift pit with standing water.
  - 9.3.7 The shoes of workers should be free from any oil or grease to prevent slipping. Potential tripping hazards such as oil lines or sump holes should be watched out. In this respect, warning signs/notices should be displayed at prominent position of the lift pit.
- 9.4 Safety Practices for Working at Lift Landings
  - 9.4.1 When workers are engaged in maintaining and examining lifts, the landing door may from time to time be required

to remain open even at where the car is not there, e.g. to gain access into the lift pit or to the car top. Appropriate dedicated devices instead of normal hand tools should be utilized to keep the lift doors in an open position. To protect the workers at work, a fencing/barrier between 900 mm and 1150 mm in height with preferably a mid-rail and toe-board of not less than 200 mm in height should be erected in front of the entrance at the lift landing [Regulation 38P of the CS(S)R].

9.4.2 The fencing/barrier should bear the relevant safety signs and warning notices in both Chinese and English to warn against the danger of removal of fencing/barrier.

9.4.3 To facilitate the worker to work on the correct equipment safely, multiple lift installations should be individually identified on the lowest and highest landing entrances as well as the associated equipment in machine rooms and pulley rooms.

9.4.4 When the car is not at its normal position at a landing, unlocking or opening of a landing door should only be done if it is absolutely necessary for carrying out work by the working personnel. Special unlocking device should be used to unlock or open a landing door and be kept in a safe place. A check should be made to ensure that the door is closed and relocked each time after use.

9.4.5 Without the provision of fencings/barriers and warning signs, a landing door/gate should always be kept close except during the short period of entering/leaving the lift well at the landing by the workers or the transportation of materials for work via the landing.

## 9.5 Safety Practices for Working in Lift Machine and Pulley Rooms

9.5.1 Safe means of access to the machine room and the pulley room should be provided and permanent warning signs should be displayed on the outside of the machine and pulley room doors. Additional permanent warning signs should be displayed inside the room adjacent to the trap door when the access is via a trap door into the machine room and the pulley room.

- 9.5.2 Adequate electrical lighting should be provided inside these rooms' floor level and at equipment. All the permanent lighting should be controlled by switches on entry inside the rooms at appropriate height. The requirements on the lighting standard as stipulated in the EMSD's Code of Practice on the Design and Construction of Lifts and Escalators (Clause 2.2.3 & 2.3.3., Part 1, Section E) should be followed.
- 9.5.3 All dangerous parts of the machine and the whole lift installation should be effectively guarded to prevent injury to the workers carrying out the lift installation, repair or maintenance work. The dangerous part which by reason of its position, its construction or the nature of the work being performed does not give rise to any reasonably foreseeable hazard to the safety of any working personnel need not be guarded.
- 9.5.4 Properly designed, installed and maintained lifting facilities should be provided for handling heavy equipment. The facilities should be tested and examined in accordance with the FIU(LALG)R. The safe working loads of the lifting appliances and lifting gears should be legibly marked in accordance with Regulations 11 and 18 of the FIU(LALG)R. Under no circumstances are these lifting facilities operated in excess of their safe working loads.
- 9.5.5 Electric shock treatment notices as required under Regulation 27 of the FIU(E)R should be prominently displayed in the machine room.
- 9.5.6 Insulation rubber mat complying with BS 921 should be placed on the floor in front of the controller and other electrical switchboards and also preferably at the rear for better protection against electric shock.
- 9.5.7 The dimensions of any holes in the slab and the floor should be reduced to a minimum as far as practicable. Ferrules which project at least 50 mm above the floor should be provided to prevent objects from falling through holes situated above the well.
- 9.5.8 The floor of the machine room should be made up of non-slip materials to prevent any tripping hazards. Preferably

it should be of same level. If the floor comprises more than one level and each is differing from another by more than 0.5 m, stairways or steps and guard-rails should be provided along the levels.

- 9.5.9 If access to the main switch for the lift is inconvenient from the lift machine or controller, a suitable stopping device should be fitted near the lift machine. The requirements for the stopping device as stipulated in the EMSD's Code of Practice on the Design and Construction of Lifts and Escalators (Clause 2.2.4, Part 1, Section E) should be followed. A means of interrupting the main supply should also be provided on or adjacent to the controller. In multiple installations within the same machine room, the stopping devices should also be located adjacent to their relevant pulleys.
- 9.5.10 Before commencing work, a thorough check should be made to verify between a specific machine and its corresponding well and associated equipment. No work should be carried out on machinery while it is in motion or which is capable of intermittent motion.
- 9.5.11 Updated electrical wiring diagrams, hydraulic circuit diagrams, schematic diagrams, etc. of the lift installation should be made available to the working personnel for reference before work commences.
- 9.5.12 No work should be carried out on or close to any live electrical equipment that electric shock danger might foreseeably arise. If this is unavoidable, adequate precautions such as the wearing of suitable insulated gloves and boots, the provision of insulating mats, temporary shrouding and the use of insulated tools, etc. should be taken to avoid electric shock or burn injuries. Also, the work should only be conducted by workers with adequate qualification and experience on electric work, and with adequate guidance/warnings and supervision given to the workers. Working alone in this situation is not recommended.

## 9.6 Safety Practices for Working on Observation or Partially-enclosed Lifts

When working on observation or partially-enclosed lifts, in addition to the safety requirements stipulated in previous sections, the following should be included:-

- 9.6.1 Temporary fencings/barriers on landings, as recommended in section 9.4.1 above, should be provided so as to prevent the fall of persons and objects (e.g. tools or equipment) from the landing into the lift well.
  - 9.6.2 The car top treatment should follow the recommendations as per C.6 of BS 5655: Part 6: 1985, such that the hinged covers provide a barrier and some weather protection.
  - 9.6.3 Means should be provided to prevent the falling of objects from the car top.
  - 9.6.4 Working personnel should take travelling on the car top of any lift as a last resort.
  - 9.6.5 Work should not be carried out in severe weather conditions such as heavy rain and strong wind etc.
  - 9.6.6 Suitable working clothing should be worn to protect against wind and coldness during work.
  - 9.6.7 Only working personnel authorized by the contractor should be permitted to clean the glazed exterior of the car or the interior of a glazed lift well enclosure.
- ## 9.7 Safety Practices for Working on Dumbwaiters
- 9.7.1 Nobody should stand and work on the car top of a dumbwaiter unless the following safety features/ precautions are provided:-
    - a) The dumbwaiter should be equipped with safety gear.
    - b) The rated load of the dumbwaiter should exceed the weight of the working personnel plus the weight of his tools.
  - 9.7.2 The dumbwaiter should not be used for carrying persons.
  - 9.7.3 When working from the car top, extreme care should be exercised to ensure that the body of the working personnel is within the confines of the car and clear of all lift well protrusions while running.

- 9.7.4 All devices operating the car should be rendered inactive (such as push buttons, automatic leveling and homing circuits, etc.) except those under the immediate control of the working personnel.
- 9.7.5 The turnbuckles on car and counterweight ropes should be checked to ensure that they are double-nutted and pinned securely.
- 9.7.6 A lift well door should never be left open or unlocked at a landing when the car is not there or under such conditions that the car can leave.
- 9.7.7 Adequate headroom and under-car-clearance should be checked before getting on top of the car or in the pit.
- 9.7.8 None should enter the pit unless the main switch to the dumbwaiter has been turned off, tagged and locked out.
- 9.7.9 For dumbwaiters with automatic transfer devices, all such devices should be isolated before working on the dumbwaiters.
- 9.7.10 When working through an open lift well door or through the machine room door and the car is to move, care should be exercised to avoid contact with the car gate spreader.

## Working on Escalators

- 10.1 Before the installation of an escalator, the floor edge along the escalator landings from which a worker is liable to fall more than 2 m should be securely fenced by the erection of suitable guard-rail. The guard-rail should be erected to a height between 900 mm and 1150 mm above the floor [Regulation 38P of the CS(S)R]. Toe board of not less than 200 mm in height and mid-rail should also be provided. Warning notices to warn against the removal of guard rails should also be provided at prominent positions.
- 10.2 During the lifting of an escalator truss or its other part, workers are prohibited to ride on the materials being lifted.
- 10.3 Lifting appliances and lifting gears used in the escalator work should be tested, examined and used in accordance with the FIU(LALG)R.
- 10.4 Prior to carrying out any escalator work, fencing and warning notices should be provided at both landings indicating that there is no access to the escalator. If traffic signs are provided at the escalator, they should be switched to the “NO ENTRY” mode to alert the users of the escalator not to use it so that disturbances to the working personnel during their work would be avoided.
- 10.5 Precautions should be taken such that the escalator cannot be set into motion without the consent of the persons performing the work. For example, the main switch of the escalator should be turned off, locked and tagged by the person-in-charge.
- 10.6 All the emergency stopping switches, overspeed and other protection devices incorporated in the escalator should be tested of their effectiveness before the work starts. Emergency stop switch should be triggered/ activated before any work is carried out in the machinery space and on the escalator truss.

- 10.7 The landing plates of the driving and return stations, if required to be removed, should be stored in a safe location. They should be placed back to cover the void space at the driving and return stations immediately after work is completed or temporarily suspended.
- 10.8 Dismantling of steps should be done carefully and in accordance with the manufacturer's instructions. All the dismantled parts such as the steps, skirting, etc. should be stacked properly and stored or placed in a safe location.
- 10.9 When walking or working on the escalator truss with all or part of its steps removed, extra care should be exercised not to drop into gaps or openings left on in the truss. Excessive grease and lubrication oil left on the truss should be removed to prevent slipping.
- 10.10 If one or more steps or step-treads of the escalator are dismantled and a gap/opening is created along the escalator, no one is allowed to operate and run the escalator on his own. Furthermore, if a person needs to ride on this escalator for visual inspection/examination purpose, he should ride behind the gap/opening so created to perform such work and the escalator should be operated under the manual control mode, preferably by a pendant remote control.
- 10.11 No working personnel should enter the escalator truss to carry out work such as the installation of balustrade and skirtings, etc. unless the main switch to the escalator has been turned off, locked out and tagged, and the escalator is stationary. Besides, warning notices should be displayed at the main switch indicating that work is in progress at the escalator at that time.
- 10.12 Vacuum cleaners should be used to remove the dust/dirts accumulated inside the escalator truss before maintenance or repair work is carried out.
- 10.13 When step, step-treads, landing plates, combplates, combplate teeth or trap doors, etc. of an escalator are removed, the escalator should never be run for testing or adjustment, etc. purposes unless the entrances at both

ends are securely fenced off and all the workers have left the escalator.

- 10.14 Escalator should not be re-started unless all obstructions are removed and coordination with other workers working within the same escalator is made. The operator who handles the switch should be able to see the entire escalator to ensure nobody is working at the escalator before re-starting.

The installation and dismantling of lifts/escalators involves many activities similar to those as others in construction industry. In the following, only those practices peculiar to the lift/escalator industry are highlighted:-

- 11.1 Installation, major overhaul, maintenance, repair or dismantling of lifts and escalators quite often involves the use of scaffolds. The scaffolds provided with suitable working platforms should comply with the requirements stipulated in the current Code of Practice for Scaffolding Safety issued by the Labour Department. Besides, additional requirements on the safe erection, use and dismantling of metal scaffolds as stipulated in section 7.1.2 should also be complied with.
- 11.2 For major alteration works of lifts in occupied buildings, which involve welding and cutting, the scaffolds used should be constructed of non-combustible materials. Hoarding of one hour fire resisting period should also be provided for any lift door opening where the lift door is removed as required by the Buildings Department.
- 11.3 If the foundation support for the scaffold has to be removed for the lift works, other supporting means such as the provision of substantial steel brackets should be provided. The steel brackets should be strong enough to withhold the imposed load and the scaffold. The aforesaid alternative means of support should be designed and approved by a professional engineer in structural discipline or equivalent.
- 11.4 The scaffold used inside the lift wells or other locations in the workplace should be inspected before use and thereafter at regular intervals as required under Regulation 38K of the CS(S)R.

11.5 The provision of a safe working place for workers, such as a suitable working platform, should always be the first choice. However, if it is impractical and there is a risk for a worker to fall more than 2 m, a safety net should be provided or the workers should wear a safety harness/belt with suitable lanyard securely attached to an independent lifeline or an anchorage as an alternative [Regulation 38Q of the CS(S)R].

11.6 If suspended working platform is used for lift work, requirements in the Factories and Industrial Undertakings (Suspended Working Platforms) Regulation should be observed.

11.7 Temporary Protection at Lift Landings

11.7.1 New Buildings under Construction

Safety protection for landing entrance openings in buildings under construction is required to prevent working personnel or objects falling through the openings. The type of protection provided should be identical to that used elsewhere on construction sites as mentioned in section 9.4.1.

11.7.2 Existing Buildings

When modernising or dismantling existing lifts, landing doors should be retained in place and kept locked until replaced. If more than a single lift door is removed at the same time, hoardings of one hour fire resisting period should be provided for lift door openings and no scaffolds made up of combustible materials should be allowed inside the lift well as required by the Buildings Department.

## Safety Practices for Special Overhaul/Repair Works on Lifts / Escalators

Some overhaul/repair works in the industry such as the replacement of main hoisting ropes in traction drive lift, the replacement of hydraulic jack in hydraulic lift, the replacement of safety gear etc. require special attention on the employees' safety and health at work. A proprietor/contractor should devise a safe system of work for a special overhaul/repair work by taking into consideration the current legal safety requirements and the instructions, in particular, the safety precautions and warnings included in the maintenance manuals published by the lift/escalator manufacturers. All the engineers/supervisors and workers should observe and follow strictly the safe system of work and the safety instructions of the maintenance manuals. Any alteration and deviation to the safe system of work and/or the safety instructions in the maintenance manual should be made only under the instructions and supervision of persons who are competent and having the appropriate technical skill and experience. In addition to the relevant safety precautions as mentioned in the previous section, special attentions should be paid to the following when carrying out the special overhaul/repair works:-

- 12.1 During the special overhaul/repair works, safe method of lifting or mechanical handling of spare parts such as the lift car or hydraulic jack, etc. should be devised in advance in the site safety assessment. Reference should be made to the recommended method of the maintenance manual published by the manufacturers.
- 12.2 The wire rope used for rigging a lift car should be of adequate strength and length. The sharp corners of the lift car should be padded to avoid any damage to the wire rope.

- 12.3 During the lifting of a lift car, the wire rope should be fixed at the anchorage points for the frame instead of tying around the top beam of the lift car. The wire rope should preferably be of simple 1:1 suspension system at the anchorage points in order to eliminate the relative movement of wire rope with respect to the anchorages.
- 12.4 If the wire rope is tied around a diverter pulley for lifting a lift car with a 2:1 suspension system, the wire rope should be placed in the groove of the pulley.
- 12.5 Lifting hook spreaded beyond the allowable limit should be discarded immediately.
- 12.6 When a wire rope is required to be looped or is making short bend, thimbles should be used in the application. U-bolts of all clamp fastening should be on the dead end of the wire rope.
- 12.7 In clamping a wire rope into an eye, the loose end should be clamped against the main rope with minimum three clamps. The distance between two clamps should be 6 to 7 times the rope diameter apart. Clamp fastenings should be inspected and maintained regularly.
- 12.8 As a safety precaution, when the lift car (with its car top as the working platform) is hoisted up to the required position for working purposes, the safety gear of the lift car should be immediately activated so as to securely fix the lift car in position.
- 12.9 Main Hoisting Rope Replacement Work
- 12.9.1 Replacement of all the old main hoisting ropes in one go for a traction drive lift is not recommended. For the sake of safety during the rope replacement work, at least some numbers of the old hoisting ropes should remain intact to hold the lift car in case of emergency.
- 12.9.2 The main switch of the lift should be turned off, locked out and tagged. Proper warning notices warning that the lift is out of service should also be posted at prominent positions so as to avoid any disturbances caused by the persons in the building intending to use the lift.

- 12.9.3 The counterweight should be set at the lowest level at the lift pit and should be securely and adequately supported to prevent it from moving during the replacement work.
- 12.9.4 For easy and safe handling of new hoisting ropes during the rope replacement work, the new ropes to be used should first be cut to the required length before delivering to the work site.
- 12.9.5 For safety sake, the old hoisting ropes should be replaced with the new hoisting ropes one after the other.
- 12.9.6 In replacement of the main hoisting ropes, the old ropes should be properly transported down to the ground for removal from the work site. Safety requirements for Manual Handling and Mechanical Lifting in sections 7.2 and 7.3 of this Code should be complied with.
- 12.10 Hydraulic Jack Replacement Work
- 12.10.1 The main switch to the hydraulic lift should be turned off, locked out and tagged.
- 12.10.2 The pressure at the hydraulic jack to be replaced should be released and the jack should retract completely to the lowest position after the hydraulic lift car has been supported by the lifting appliance installed at the top of the lift well or at the machine room located above.
- 12.11 Safety Gear Replacement Work
- 12.11.1 The lift car should be set near the bottom terminal landing to reduce the risk of falling from height during the replacement of safety gear at the bottom of the lift car.
- 12.11.2 Proper working platform erected from the lift pit should be provided for the working personnel carrying out the safety gear replacement work.
- 12.12 After the special overhaul/repair work, the lifting appliance and the lifting gear for lifting/rigging purposes should be dismantled properly and the support for counterweight should also be removed before putting back the lift to normal service in the building.

- 13.1 Code of practice on the design and construction of lifts and escalators, 1993.  
[EMSD, Hong Kong Government]
- 13.2 Code of practice for the safe construction and installation of electric passenger, goods and service lifts, 1972.  
[ILO]
- 13.3 BS 921 : Specification for rubber mats for electrical purposes.  
[BSI, U.K.]
- 13.4 BS CP 1017 : Distribution of electricity on construction and building sites.  
[BSI, U.K.]
- 13.5 BS 5266 : Emergency lighting.  
[BSI, U.K.]
- 13.6 BS 5304 : Code of Practice for safety of machinery.  
[BSI, U.K.]
- 13.7 BS 5378 : Safety signs and colours.  
[BSI, U.K.]
- 13.8 BS 5655 : Lifts and service lifts. (EN 81, ISO 4190, ISO 7465)  
[BSI, U.K.]
- 13.9 BS 5656 : Safety rules for the construction and installation of escalators and passenger conveyors. (EN 115)  
[BSI, U.K.]
- 13.10 BS 5973 : 1993 - Code of practice for access and working scaffolds and special scaffold structures in steel.  
[BSI, U.K.]
- 13.11 BS 7255 : 1989 - Code of practice for safe working on lifts.  
[BSI, U.K.]
- 13.12 Elevator World : Educational package and reference library, Volume 2 - Elevator maintenance and traffic, 1990 edition.  
[Elevator World, U.S.A.]
- 13.13 Elevator industry field employees' safety handbook, 1991 edition.  
[Elevator World, U.S.A.]

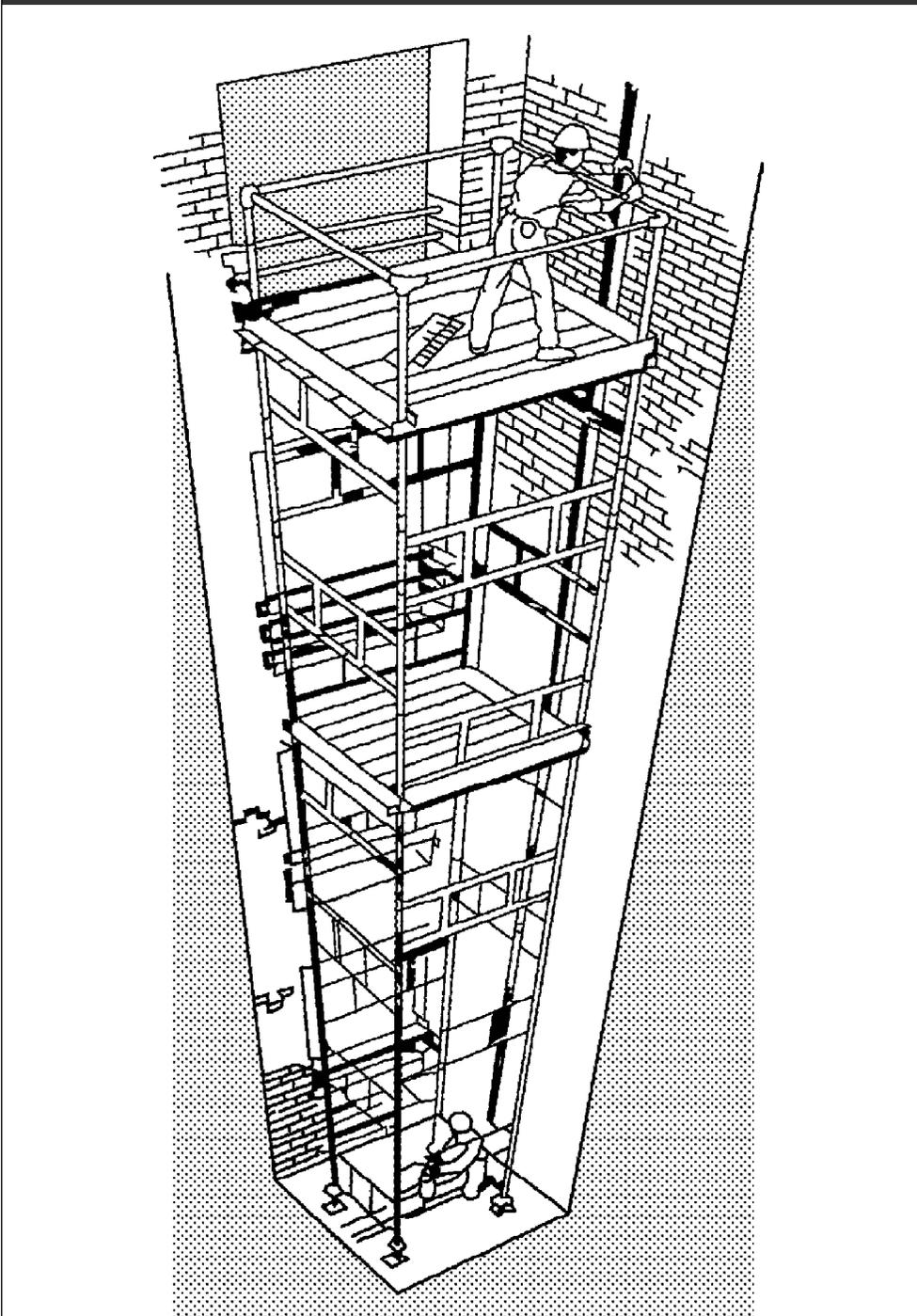
- 13.14 Lift safety: site handbook, 1991.  
[Engineering Employers' Federation, U.K.]
- 13.15 Elevator maintenance handbook, 1993.  
[People's Post and Telecommunication Publishers, P.R.C.]
- 13.16 HSE Guidance Note PM 26 : safety at lift landings,1981.  
[Health and Safety Executives, U.K.]

## General Duties Provisions of the Factories and Industrial Undertakings Ordinance, Chapter 59 of Laws of Hong Kong

- I. Section 6A of the Factories and Industrial Undertakings Ordinance, General Duties of a proprietor
  1. It shall be the duty of every proprietor of an industrial undertaking to ensure, so far as is reasonably practicable, the health and safety at work of all persons employed by him at the industrial undertaking.
  2. Without prejudice to the generality of a proprietor's duty under subsection (1), the matters to which that duty extends include in particular -
    - a) the provision and maintenance of plant and systems of work that are, so far as is reasonably practicable, safe and without risks to health;
    - b) arrangements for ensuring, so far as is reasonably practicable, safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances;
    - c) the provision of such information, instruction, training and supervision as is necessary to ensure, so far as is reasonably practicable, the health and safety at work of all persons employed by him at the industrial undertaking;
    - d) so far as is reasonably practicable as regards any part of the industrial undertaking under the proprietor's control, the maintenance of it in a condition that is safe and without risks to health and the provision and maintenance of means of access to and egress from it that are safe and without such risks; and
    - e) the provision and maintenance of a working environment for all persons employed by him at the industrial undertaking that is, so far as is reasonably practicable, safe, and without risks to health.
- II. Section 6B of the Factories and Industrial Undertakings Ordinance, General Duties of persons employed
  1. It shall be the duty of every person employed at an industrial undertaking while at work -

- a) to take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions at work; and
- b) as regards any duty or requirement imposed on a proprietor of the industrial undertaking or on any other person by this Ordinance for securing the health and safety of persons employed at the industrial undertaking, to co-operate with him so far as is necessary to enable that duty or requirement to be performed or complied with.

Figure showing a typical metal scaffold with suitable working platforms erected inside a typical lift well for the use of the working personnel in the industry



**Note** :For simplicity, illustrations on using additional guys, anchors, outriggers or kentledge for scaffold stability purposes have been left out in this figure.

## Standards relevant to the prevention of fall from height

1. Reference for the standards and specifications of safety harnesses/ belts can be made to:-

- a) BS EN354 : 1993  
Personal protective equipment against falls from a height - Lanyards.
- b) BS EN355 : 1993  
Personal protective equipment against falls from a height - Energy absorbers.
- c) BS EN358 :1993  
Personal equipment for work positioning and prevention of falls from a height - Work positioning systems.
- d) BS EN359 : being prepared
- e) BS EN361 : 1993  
Personal protective equipment against falls from a height - Full body harnesses.
- f) BS EN362 : 1993  
Personal protective equipment against falls from a height - Connectors.
- g) BS EN363 : 1993  
Personal protective equipment against fall from a height - Fall arrest system.
- h) BS EN364 : 1993  
Personal protective equipment against falls from a height - Test methods.
- i) BS EN365 : 1993  
Personal protective equipment against falls from a height - General requirements for instruction for use and for marking.

[The above BS EN standards supersede the former BS 1397: 1979 - Specification for industrial safety belts, harnesses and safety lanyards.]

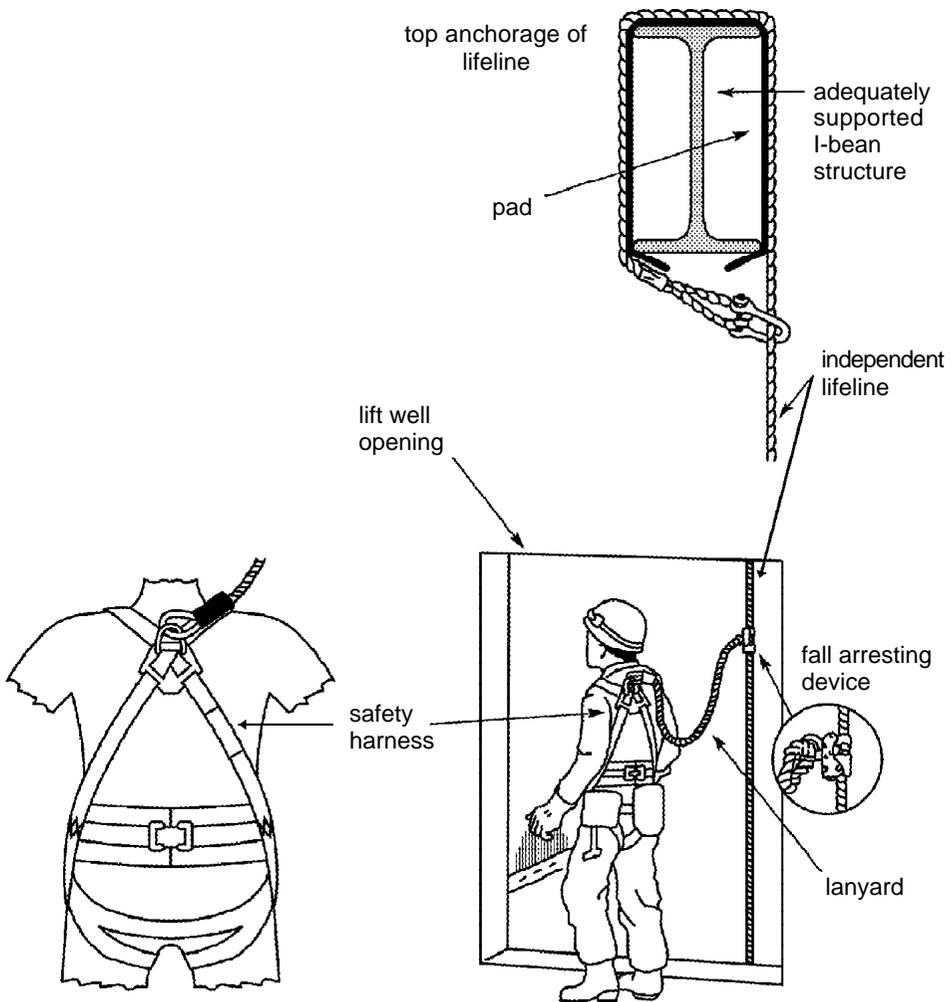
2. Reference for the standards and specifications of suitable anchorages for safety harnesses/belts can be made to:-

- a) BS 5845: 1991  
Specification for anchors for industrial safety belts and harnesses.

- b) BS 6858: 1987  
Specification for manually operated positioning devices and associated anchorage lines for use with industrial safety belts and harnesses.
- c) BS EN353-1 : 1993  
Personal protective equipment against falls from a height - Guide type fall arresters. Part 1 : Specification for guided type fall arresters on a rigid anchorage line.
- d) BS EN353-2 : 1993  
Personal protective equipment against falls from a height - Guided type fall arresters. Part 2 : Specification for guided type fall arresters on a flexible anchorage line.
- e) BS EN355 : 1993  
Personal protective equipment against falls from a height - Energy absorbers.
- f) BS EN360 : 1993  
Personal protective equipment against falls from a height - Retractable type fall arresters.
- g) BS EN362 : 1993  
Personal protective equipment against falls from a height - Connectors
- h) BS EN363 : 1993  
Personal protective equipment against falls from a height - Fall arrest systems.
- i) BS EN364 : 1993  
Personal protective equipment against falls from a height - Test methods
- j) BS EN365 : 1993  
Personal protective equipment against falls from a height - General requirements for instructions for use and for marking.  
  
[Formerly BS 5062: Part 1: 1985 - Specification for self-locking safety anchorages and associated anchorage lines is superseded by BS EN353-1, BS EN353-2, BS EN355, BS EN360, BS EN362, BS EN363, BS EN364 and BS EN365]
- k) BS EN365 : 1993  
[Formerly BS 5062 : Part 2 : 1985 - Recommendations for selection, care and use.]

3. Reference for the standards and specifications of safety nets can be made to:-
  - a) BS 3913 : 1982 - Specification for industrial safety nets.
  - b) BS 8093 : 1991 - Code of Practice for the use of safety nets, containment nets and sheets on constructional works.  
[Formerly BS CP93 : The use of safety nets on constructional works.]
4. Though safety standards of the British Standards Institution are quoted, other international standards or provisions which are equal in standard as those mentioned above will also be accepted as alternatives.

## The use of safety harness and independent lifeline for working personnel in the industry



lanyard should be attached to the center back and to lifeline above shoulder height

## Use of safety harnesses and lifelines

1. The above illustrations show the anchorage of the safety harness to the lifeline before entering the lift well and the top anchorage of the lifeline. Such lifelines should be installed before working in the lift well and should run the full length of the lift well in one piece.
2. Lanyard should be anchored to the lifeline above shoulder height so that any fall should not exceed 1.8 m. When using a metal lifeline with stops, each lanyard should be equipped with an extra floating snap to assure positive anchorage to lifeline while passing lifeline stops. When using this type of system a full body harness must be utilized. The use of a rope grab eliminates the need of unhooking and rehooking when moving up or down in a lift well.
3. Lifelines, safety harnesses and lanyards actually subjected to in-service loading, as distinguished from static loading, should be immediately removed from service and destroyed.
4. Tying the lanyard to the hoisting rope or any part of the lift car should be prohibited. The lanyard should not be snapped back onto itself.