Alpha
Consulting Engineers Pte Ltd

FEEDBACK REPORT FORM

Ref No: 136 - 200410 (S)

To: LCT From: LFY

Job No./Project: LIFT MASTER SPECS *(where applicable)*
Section 4 - Car Enclosures & Fixtures

Source of feedback: _____

Scope of Feedback: * ☐ Quality ☐ Environmental ☐ Administrative ☐ Contractual
☐ Technical ☒ Specification ☐ Others

Section A : Problem & Cause
Update spec on door safety devices - mechanical safety edge deleted - outdated. Now use multi-beam door sensor.

Section B : Mitigating Action Taken, if any

Section C : Suggested Corrective Action
Update spec

Section D : Approved Corrective Action

Document Affected * : ☑ Yes ☐ No Affected Document : L/4-1 to L/4-12

Approved By : (LCT) Date : 21/4

Section E : Action

Action By : NA

Targeted Completion : April 2010

Actual Completion : 19 April 2010 Verified By : (LCT)

** Mark [X] where appropriate*

Distribution:

Select one of the following headings

LIFT & ESCALATOR INSTALLATION

LIFT INSTALLATION

ESCALATOR INSTALLATION

SECTION 4 - CAR ENCLOSURES & FIXTURES

4.1 General

The lift cars shall be complete with protected roofs, car enclosures, doors, fixtures and all accessories. All lift cars shall be so located in the respective hoistways such that when levelled at a lift landing with the doors open, it will be impossible for an object to become trapped between the car platform and the lift landing while the car is within the landing zone.

As the appearance of lift cars is part of the overall building design feature, the design and construction details of all the internal furnishes of the lift cars including actual samples of the materials for the finishes shall be submitted early for review by the Architect before fabrication ~~any fabrication is proceeded with~~.

4.2 Car Enclosures

Materials for car enclosures and enclosure linings shall conform to the current edition of the Singapore Standard CP 2: Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts.

The car enclosures for all lifts shall be fabricated from steel and capable of withstanding a pressure of 333.6N horizontally applied at any part without permanent deformation. Deflection should not reduce the running clearance as stipulated in the current edition of the Singapore Standard CP 2: nor exceed 25mm. The enclosure shall be so secured to the car frame and car platform that it cannot work loose or become displaced under ordinary service conditions.

4.3 Car Frames

4.3.1 Construction

Every lift car body shall be carried in a steel car frame sufficiently rigid to withstand the operation of the safety gear without permanent deformation of the car frame. The safety factor for these frames shall not be less than five (5).

At least four sets of renewable roller guide shoes shall be provided for each lift car, two at the upper edges and two at the lower edges of the car frame. These guides shall be held in contact with the guide rail surfaces by means of adjustable cushioning devices and they shall run on dry, unlubricated guide rails.

Nylon sliding guide shoes may be used for lifts of speed not exceeding 105 mpm.

Include the following paragraph for double deck lifts - Double Deck Lifts

For double deck lifts, additional guides shall be provided on both sides of each of the cars at the floor level of the upper car for safety gears. These guides shall not touch the guide rails under normal operation.

4.3.2 Rubber Pads

The support frames of lift cars shall carry rubber pads upon which the car platform shall rest. Where the upper part of the car is braced to the frame, additional rubber pads shall be provided to form an effective isolating cushion between the car and the steel frame.

4.4 Car Platforms

4.4.1 Construction

Car platforms shall be of framed construction. The platform consisting of a structural steel frame and a steel floor and the floor finishes as specified shall be designed on the basis of the contract load and the loads of the car finishes being evenly distributed with a minimum safety factor of 5.

The structural steel frame of the car platforms shall be anti-rust treated and painted. The car platform shall be properly isolated to prevent transmission of noise and vibration from the car frame to the car platform.

Include this paragraph for double deck lifts - Double Deck Lifts

For double deck lifts the upper car platform shall be acoustically treated and/or anti-vibration mounted to minimise the traffic noise to a level below NC 45 at all times with the car doors closed.

4.4.2 Clear Platform Size

The nett platform area of the lift after taking into consideration the car finishes as specified shall be related to the car capacity called for and in accordance with the current edition of the Singapore Standard CP 2.

01/04/97

Include the following clause where lift car side emergency exits are required for between adjacent lift; these side emergency exits are for those lifts which pass non-stop through the blind hoistways and that Hoistway Emergency Access Doors cannot be provided.

4.5 Side Emergency Exits

Side emergency exits shall be provided for the lift cars where shown on the Specification Drawings or indicated in the Schedule. The car platforms shall be so located such that the distance between the adjacent car platforms does not exceed 760mm. Each side emergency exit door shall:

(a) Be of the hinged type

(b) Open only into the car

(c) Extend from the floor to a clear height of not less than 1500mm and shall have a width sufficient to provide not less than 355mm of clear passage-way when the door is opened

(d) Be so located as to provide free passageway so that passage of persons is not obstructed by any lift equipment

(e) Be provided with a lock so arranged that the door may be opened from inside the car only by a specially-shaped removable key, and from outside the car by a non-removable handle. Locks shall be so designed that they cannot be opened from the inside by the use of ordinary tools or instruments

(f) Be provided with car-door electric contacts so located as to be inaccessible from the inside of the car

(g) Be of the same material and construction as required for the enclosure.

A connecting platform shall be provided, which shall be automatically lowered into position when any of the side emergency exits is opened.

Key switches shall be provided in the car operation panels of the lifts concerned for reduced speed operation and photoelectric beam detectors shall be provided on each lift to permit automatic alignment of the rescue lift to the faulty lift.

Include this sentence for double deck lifts.

Where the side emergency exits are called for in double deck lifts as shown on the Specification Drawings, the side emergency exits shall be provided for both the upper and lower cars of each lift.

30/11/95
Not required for contracts calling for dumbwaiters only.

4.6 Top Emergency Exits

4.6.1 General

Top emergency exit shall be provided on the roof of each lift car. All apparatus mounted above the roof of the lift car shall be clear of this exit. The exit cover shall open outwards and shall be so hinged to the car top that the cover can be opened from the top of the car only.

Add this paragraph only where there are double deck lifts.

For each of the double deck lifts, the top emergency exit shall be provided for both the upper and lower cars similar to those for single deck lifts. In addition, a suitable hinged access panel shall be provided on the floor of the upper car at a position immediately above the top emergency exit of the lower car and shall be installed in a manner as to facilitate rescue of passengers from the lower car to the upper car; a suitable permanent cat ladder shall also be provided for this purpose.

4.6.2 Interlock

Panels for all emergency exits including those on the ceiling and floors of the double deck lifts shall be provided with an interlocking electrical switch which will prevent operation of the lift when the panel is open.

4.7 Car Floor Finishes

The floor finishes for the lift cars shall be as stipulated in the Schedule of this Specification and/or as shown on the drawings.

Door sills shall be of extruded aluminium alloy section with a non-slip wearing surface unless otherwise specified in the Schedule.

4.8 Car Wall Finishes

The wall finishes of the lift cars shall be as stipulated in the Schedule of this Specification and/or as shown on the drawings.

Heavy duty protective padded canvasses shall be provided for the selected lifts as specified in the Schedule of this Specification. The protective canvasses shall be designed for hook-on

hanging and shall be provided for the three (3) sides of the car walls. The hooks shall be so installed that they are not exposed to sight when the canvasses are removed.

4.9 Car Ceiling

The car top enclosure shall be of steel and shall be painted with anti-rust enamel with a top coat. Provisions shall be made for ventilation of the lift car as specified below. The materials and details of the false ceilings shall be as specified in the Schedule of this Specification and/or on the drawings of this Specification.

The internal clear car heights as measured from the finished floor level to the internal car top enclosure and to the false ceilings shall be as indicated in the Schedule of this Specification.

4.10 Car Handrails and Car Kick Plates

Car handrails where called for in the Schedule of this Specification shall be installed such that the top does not exceed 900mm from the finished car floor in accordance with the Code For Barrier Free Accessibility.

The finishes of the car kick plates for all the lifts shall be as specified in the Schedule of this Specification.

4.11 Illumination

4.11.1 Illumination - General

The minimum average illuminance on the floor of all the lift cars shall not be less than 150 lux. The luminaires shall be installed above the false ceilings of the lifts, or surface mounted, where appropriate to the Architect's requirements.

Following clause not required for dumbwaiters
01/04/97

4.11.2 Emergency Lighting

Emergency lighting for the lift cars to be fed from a rechargeable emergency power supply unit shall be provided in accordance with Singapore Standard CP 2.

Not required for dumbwaiters.
01/04/97

4.12 Ventilation

4.12.1 General

Adequate mechanical ventilation shall be provided for every lift car using one or more fans of appropriate capacity. The fans shall be located above the false ceiling or recessed in the car ceiling as appropriate, all subject to review by the Architect.

Low noise blower fans shall be employed such that the internal noise levels of each lift car shall not exceed 55dBA with the car doors are closed.

Include this paragraph for double deck lifts.

For the double deck lifts, mechanical ventilation shall be provided for both the upper and lower cars of each lift.

4.12.2 Emergency Power Supplies

The ventilation fans in accordance with the Code requirements, shall be fed by emergency power supplies.

Not required for dumbwaiters

4.13 Car Position Indicator

4.13.1 General

Digital car position indicator shall be provided above each car entrance transom panel inside every lift car.

Include the following sentence for double deck lifts.

Double Deck Lifts

For the double deck lifts, one car position indicator shall be provided for each of the upper and lower cars.

4.13.2 Type

The car position display shall be the digital read-out, alpha-numeric type comprising two 16-segments characters in green colour and of not less than 50mm in height with over 160 degree angle of view for continuous floor location reading. Flashing indicators shall be provided when the lifts pass through blind hoistways.

4.13.3 Stainless Steel Faceplate

Each car position indicator shall be flush mounted on a hairline stainless steel faceplate to the Architect's requirements.

Following clause not required for dumbwaiters.
06/04/10

4.14 Notices

A 'No Smoking' notice with an appropriate logo ~~and the following message~~ shall be provided for each lift car.

~~'Smoking Strictly Prohibited~~
~~The Offence Carries A~~
~~Maximum Fine Of $1,000'~~

The sign shall be reversed silk screened on an acrylic panel or engraved on a stainless steel panel as required by the Architect.

Include this clause for Goods Lifts.
30/11/95

4.15 Sign for Goods Lifts

The following notice shall be prominently displayed in each of the goods lifts.

'FOR FREIGHT ONLY, PASSENGERS NOT ALLOWED'

4.16 Capacity Plates

The contract load of each lift in kilograms and in number of persons, where appropriate, shall be engraved onto each of the car operating panels, the sizes and design of the letterings shall be subjected to review by the Architect.

4.17 Doors

4.17.1 Construction

All doors shall be constructed of at least 1.6mm (16 SWG) steel with welded joints, of flush construction and shall be filled with suitable materials to achieve the required acoustic and fire ratings. The doors shall be reinforced and provided with emergency keyways for manual opening of the landing doors from the lift hallways for rescue and maintenance purposes. Every landing door shall be provided with an electro-mechanical door interlock which will prevent the lift from being started or kept in motion unless all landing doors are closed, and the interlock contacts made.

All lift doors shall bear the PSB test label to certify the fire rating.

Include this paragraph for Double Deck Lifts.

Double Deck Lifts

For double deck lifts, both the upper and lower doors shall be interlocked with the lift operation such that the lift can only be started up or kept in operation when both doors are fully closed.

4.17.2 Type

Doors shall be of two-panel automatic centre opening type, four-panel automatic centre opening type, etc. as specified in the Schedule of this Specification. The door opening widths as shown on the Specification Drawings are clear widths.

4.17.3 Finishes

The finishes for the car doors shall be as specified in the Schedule of this Specification.

4.18 Door Hangers and Tracks

Both car and landing doors shall be fitted with sheave type door hangers. The sheave wheels shall be tyre with a noise reducing material and shall rotate on a grease packed precision ball bearing. The upthrust of the door shall be taken by a roller mounted underside of the hanger track.

The roller of each door shall be mounted on an eccentric stud to provide for adjustment. The hanger tracks shall be of either formed cold rolled steel or cold drawn steel of heavy section with surfaces shaped to conform to the tread of the hanger sheaves and rollers. Suitable means shall be used to transmit motion from one door panel to the other.

Not required for dumbwaiters.

4.19 Manual Opening

4.19.1 General

The car door and the associated power operated landing door shall be able to open manually from within the car concerned in the event that the lift stops within the landing zone and the power supply to the door operators is cut off. Emergency devices and keys for opening the doors from the landings shall be provided for all lifts. Two (2) sets of the devices/keys shall be provided for each lift.

Include the following paragraph for double deck lifts.

Double Deck Lifts

For double deck lifts, the mechanism for the manual door opening of the upper and lower cars of each lift shall be independent so that the opening of door of any of the cars should not cause the door of the other car to open.

4.20 Door Operators

4.20.1 General

The car door operator shall comprise a heavy duty, high speed d.c. or a.c. motor, operating mechanism, linkage and switches to enable the speed of door operation to be varied or adjusted to ensure the smoothest, fastest opening and closing possible.

The car and landing doors shall operate as one unit when the lift is levelling, and shall close either after the expiration of a time interval, or when a car call button is registered, or when the start button is pressed by an attendant manually operating the lift.

Not required for dumbwaiters.
30/11/95

4.20.2 Dwell Time

The 'dwell time' i.e. the time interval for which the lift doors remain open when a car stops at a landing, shall be independently adjustable for response to car calls and to hall calls. Furthermore, the 'dwell time' at the main lobby can be adjusted independently from those at the upper floors. The 'dwell time' shall be adjustable from 1 sec to 10 sec. The control system shall differentiate between a car call or a hall car and automatically reduce or lengthen the dwell time.

Include the following for double deck lifts.
30/11/95

4.20.3 Double Deck Lifts

For each double deck lift, an independent door operator shall be provided for each of the upper and lower car.

4.21 Door Safety Devices

Door Safety Devices - Lifts

Multi-beam door sensors shall be installed at each car entrance to protect passengers entering or leaving the car. The sensors shall produce a wide angle detection on the landing floor which shall move well ahead of the closing doors, and reverses them without physical contact. The door shall reverse immediately if any passenger at the landing floor entrance is detected while the doors are closing. The timing devices of the door operators and/or control system shall be operated in conjunction with the door sensors to provide adjustable, reduced hold open time once the detectors are activated and the doors re-opened.

~~In addition to the electronic door detectors, mechanical door safety edges of anodized aluminium in black or silver metallic extending a minimum of 45mm beyond the leading edge of car doors for the full height of the entrance shall be provided for the car door of each lift; the safety edge on any of the car door panels, on touching the passenger, a compression of not more than 13mm shall cause the door to reopen immediately to prevent crushing the passenger. The doors shall reclose immediately thereafter. When the doors are fully closed, the edges shall retract to a position flush with the door panels.~~

Include this paragraph for goods lifts

Goods Lifts

For goods lifts, the door safety devices may be in the form of safety shoes provided at the underside of the lifting panel as well as light rays or photo electric beam detectors.

Include this paragraph for double deck lifts

Double Deck Lifts

For double deck lifts, the door safety devices shall be provided for both the upper and lower cars of each lift.

4.22 Car Operating Panels

The number of car operating panels to be provided in each lift car shall be as stipulated in the schedule of this Specification. All car operating panels shall be of stainless steel finish and the main operating panel shall contain the following:

4.22a Select this paragraph if there is a Lift Supervisory Repeater.

(a) An 'ALARM' button which, when pressed, shall cause battery operated alarm bells to sound at the following locations:

(i) Lift Supervisory Control Centre.

(ii) At the designated main lift lobby, ~~outside the lift hoistway of the lift concerned~~

(iii) Lift Supervisory Repeater Panel.

All alarm bells, batteries and wiring required shall be provided under this Works.

4.22b Select this paragraph if there is no Lift Supervisory Repeater.

(a) An "ALARM" button which, when pressed, shall cause battery operated alarm bells to sound the following locations:

(i) Lift Supervisory Control Centre.

(ii) At the designated main lift lobby, outside the lift hoistways of the lift concerned

All alarm bells, batteries and wiring required shall be provided under this Works.

(b) Illuminated 'Up' and 'Down' direction indicators. Alternatively, these indicator lights could be incorporated on the car position indicator mounted above the entrance inside each car, where applicable.

4.22c Car Overload - Single Deck Lifts

(c) A 'CAR OVERLOAD' indicating lamp with buzzer.

4.22d Car Overload - Single & Double Deck Lifts

(c) A CAR OVERLOAD' indicating lamp with buzzer. For double deck lifts, the operation of the indicating lamps at both the upper and lower cars of each lift shall be independent of each other.

(d) One or more vertical rows of circular or square shape, as required by the Architect, recessed electronic floor despatching micro-movement push buttons bearing appropriate letters and numerals for designated stopping floors. The buttons shall

remain illuminated until the lift car stops at the floor indicated and automatically cancels the call.

(e) A 'DOOR OPEN' micro-movement push button.

(f) A 'DOOR CLOSE' micro-movement push button.

(g) For double deck lifts, a visual information display unit with full alpha-numeric capacity shall be installed to display important information of the lift operation. The displays shall be in green of at least 12mm high and shall include, amongst other things, the following.

(i) 'Serving Lower Deck' in the upper car and 'Serving Upper Deck' in the lower car.

(ii) 'Odd Storeys Only" in the lower car and 'Even Storeys Only' in the upper car

All the above displays shall correspond to the actual operation of the lifts concerned.

(h) For the lower cars of the High Rise double deck lifts, an engraved message stating.

'Highest Floor Served - ____ Storey. Please Transfer.'

(i) An English language voice synthesizer complete with microprocessor, vocabulary chips, loudspeaker volume control etc. for announcing to the passengers, the floors arrived at, direction of car travel, messages for obstructed doors, lift full, power interruption, technical difficulties etc. The synthesized voice should be true and close to the human voice, shall be subjected to the Architect's acceptance. The sequence and frequency of the announcement of all messages shall be to the Architect's requirements.

(j) For each of the goods lifts, a warning buzzer which shall sound automatically whenever the door starts to close.

(k) For goods lifts, an indicating light and a push button which when pushed, will cause the door hold open time to be prolonged to a predetermined period of time (adjustable up to 5 minutes). The indicating light shall be illuminated to show that the door hold open time has been prolonged. Before the expiry of the prolonged door time, it shall be possible to deactivate (i.e. off) the push button to enable the doors to close automatically. Upon expiry of the prolonged door time, the passenger shall also be able to activate the button again, in which case the doors shall be held open again for the predetermined period.

(l) For single deck lifts, a 'CANCEL' button which, when pressed, shall cancel all existing car calls. This button shall be operative only during the 'ATTENDANT' operation.

(m) For single deck lifts, a 'PASS' button which shall cause the lift to by-pass all landing calls when continued pressure is maintained on the button. This button is to be operative only during the 'ATTENDANT' operation.

(n) For single deck lifts, an 'UP' button which, when pressed, shall cause a down travelling car to reverse its direction of travel. Similarly a 'DOWN' button, when pressed, shall cause a up travelling car to reverse its direction of travel. These buttons are to be operative only during the 'ATTENDANT' or 'SLOW SPEED' service operation.

(o) A switch whereby the ventilation fan in the associated car can be switched on or off as required.

(p) A car light switch whereby the lights in the associated car can be switched on or off.

(q) A 'DOOR' switch whereby the door operation of the associated car can be switched off. This switch is to be operative only when the lift is under single car independent operation.

(r) A switch to effect full automatic operation without attendant for single deck lifts.

(s) A switch to effect automatic operation with attendant for single deck lifts.

(t) A switch to effect single car independent operation whereby any of the lifts (except for single car operation) can be removed from the group operation system and operate independently.

(u) A switch to effect slow-speed or hand operation for service and maintenance purpose whereby the lift can be made to travel at the standard reduced servicing speed of approximately 15 mpm.

(v) A switch to effect slow-speed or hand operation for service and maintenance purpose whereby the lift can be made to travel at the standard reduced servicing speed of approximately 15 mpm. For double deck lifts, the switches at both the upper and lower cars of each lift shall be interlocked such that when the one of the switch is activated, the operation of the other switch shall not cause the lift to return to full speed operation.

(w) A suitable glass fronted frame to display the 'Certificate of Maintenance of Lifts' to be issued by the Buildings Management Unit. The details of this frame shall be subjected to review by the Architect.

(x) The Intercom facilities as described elsewhere in this Specification.

Items (l) to (u) inclusive shall be located in a recessed cabinet with a hinged cover, which shall form part of and be integral with the car operating panel. The cover of this recessed cabinet shall be stainless steel with hairline finish similar to the faceplate of the car operating panel, and shall be provided with suitable lock. All the buttons and switches shall be suitably labelled.

Where two nos. car operating panels are called for in the Schedule of this Specification, one of them shall be the main car operating panel while the other shall be the auxiliary car operating panel which shall incorporate only items (i) to (ix) inclusive above.

Where car operating panels for use by the wheelchair bound are called for in the Schedule of this Specification, each panel shall incorporate items (i) to (ix) inclusive above. The panel shall be mounted at the side wall of the lift car floor level and the highest control button shall not be more than 1500mm from the car floor level.

4.23 Maintenance Panels

A top-of-car panel shall be provided and shall comprise amongst other items, a stop switch, car roof light switch, a door controller switch and a maintenance Fully Automatic/Service Speed selection switch.

The Fully Automatic Service speed selection switch when activated shall cause the car to operate at a speed not exceeding 45 mpm. Also when the Fully Automatic/Service Speed selection switch is activated the lift cannot be switched to full speed operation accidentally by someone in the lift car.

The stop switch when activated shall prevent the lift from being operated.

The door controller switch shall prevent the door from being operated during testing and adjustment.

Include the following sentence for double deck lift.

For the double deck lifts, two maintenance panels shall be provided, one for each of the upper and lower cars.

4.24 Sound System In Lift Cars

Every lift car shall be provided with a high quality loudspeaker system for voice announcement and piped music to be relayed from the Building Sound System, which will be provided by others. A 125mm diameter co-axial loudspeaker shall be provided in each of the lift cars concerned, inclusive of all relevant wiring etc. from each of the lift cars to the terminal boards at the associated lift machine rooms near to the entrances, for connection to the Building Sound System.

Include the following paragraph for double deck lifts.

For double deck lifts, a loudspeaker shall be provided for each of the upper and lower cars.

The 125mm diameter co-axial loudspeakers shall conform to the following Specification.

(a)	Power handling capacity	: 6 watts (music power)
(b)	Sound pressure level	: 90 dB measured at 1 m on axis with 1 watt input
(c)	Frequency response	: 85 Hz to 15,000 Hz
(d)	Impedance	: 8 ohms
(e)	Recommended loudspeakers	: Philips type AD 5081/M or equivalent.

The loudspeaker complete with matching transformers, terminal blocks etc. shall be housed in a protective acoustic aluminium enclosure and complete with acoustic padding, mounting ring, baffles and the necessary mounting brackets. Enclosures shall be similar to 'Soundolier' 95 series or equivalent. The brushed aluminium trim ring baffle shall be similar to 'Soundolier' 60 series or equivalent.

Drawings showing the locations of the loudspeakers in the lift cars shall be submitted to the Architect for review.

Matching transformers shall be of high efficiency type of appropriate power rating and with at least 5 secondary tapping suitable for a system distribution voltage of 70 volts or 100 volts.

Include the following clause if it is intended to install CCTV cameras (by others) within the lift cars.
30/11/95

4.25 Wiring for CCTV Cameras In Lift Cars

Close circuit television camera in the lift cars, where indicated in the drawings or in the Schedule of this Specification shall be provided by others. The power supply cables shall be terminated in junction boxes in the respective lift machine rooms near the access doors while

the other end of the cables shall be terminated in 230 volt, 13 amp unswitch fused connection units to be located on top of the lift car concerned. The close circuit television signal cables for the lift cars shall be terminated likewise except that the cables on top of the lift cars shall be terminated in approved junction boxes with proper labels. The power cables for cars shall be similar to those used for wiring to 13 amp switch socket outlets on top of the lift cars while the signal cables shall be low-loss co-axial cables and shall be compatible with close circuit television system provided by the others.

Include the following paragraphs if it is intended to install CCTV cameras in double deck lifts.

For double deck lifts, the above provisions shall be allowed for both the upper and lower cars.

However, the Works shall include the supply and installation of the power supply cable and signal cable for the closed circuit television system from the lift car to the respective lift machine room.