PERKHIDMATAN PENGOPERASIAN, SERVIS BERJADUAL DAN PENYELENGGARAAN SECARA KOMPREHENSIF UNTUK SISTEM-SISTEM LIF PENUMPANG DI UNIVERSITI TEKNOLOGI MARA (UITM) KAMPUS SUNGAI BULOH, SELANGOR DARUL EHSAN BAGI TEMPOH SATU (1) TAHUN

OPERATION & MAINTENANCE MANUAL (O&M)

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2. Introduction 2.1 Important Notes

2.1 IMPORTANT NOTES

- 1) Children below school age must not use this lift unless accompanied by an adult.
- 2) The maximum weight or number persons indicated must not be exceeded.
- 3) Should this lift not operate normally, do not attempt to leave the car. Summon help by pressing the alarm button.
- 4) Do not use this lift in the event of fire in the building.
- 5) Stand within easy reach of the control panel when transporting goods in the car. Keep goods clear of your position.

3. System Description

3.1 List of equipment installed

3.2 Operation Instruction

3.3 List of equipment installed

3. Description of the Installation

3.0 DESCRIPTION OF SYSTEM & OPERATION INSTRUCTION

3.1. GENERAL CONTROL SYSTEM

A Group Supervisory System coordinates the operation of individual lifts, which are all on Collective Control and are interconnected.

The Supervisory System regulates the dispatching of individual cars and provides service to all floors as different traffic conditions arise, minimizing such unproductive factors as idle cars, uneven service and excessive waiting time. The system will respond automatically to traffic conditions such as UP and DOWN peaks, balanced or light traffic operations. This Group Supervisory System does not apply to simplex control.

3.1.1 <u>COLLECTIVE SELECTIVE CONTROL SYSTEM</u>

The landing boards of a Collective Selective Control System are provided with an UP and DOWN call button each, by means of which a call for the desired direction can be given. Landing and car calls can be registered and stored at any time. The landing call buttons light up, when touched to indicate acceptance of the calls.

The car answers on its way up, all the registered UP landing calls and car calls, and on its way down, all the DOWN landing calls and any newly registered car calls, in natural sequence.

It does not reverse its direction of travel until all the registered landing and car calls ahead of it have been answered. A load measuring device prevents a fully loaded car from making any useless stops in response to further landing calls.

3.1.2 CAR OPERATING PANEL

The following minimum controls had been provided with a main operating panels mounted on the right front panels. The buttons are arranged at convenient height above the car floor. The panel covers are made of stainless steel. The panel are fitted with the following :-

a) Load Plate

Provide information on the number of passenger and capacity load and important operating instructions. Note that these instructions are to be observed at all times.

b) Call button

A bank of floor selector buttons numbered to correspond with the various floor landing served.Car calls are registered when the appropriate button is pressed.

c) An emergency alarm button.

Pressing this button will sound the alarm in the form of ringing bell located at the main landing. This will also enables intercom communication between the car passengers and the supervisory room.

By just speaking aloud, an in-built microphone will be able to pick up the conversation. The communication is enabled for a preset time period after each press on the alarm button.

d) "Open Door" and "Close Door" buttons

Normally, the lift doors would have close after a preset dwell time e.g. 10 sec. However should one wish to close the door earlier than this, pressing the "Door Close" button will initiate closing action of the door.

Likewise if one were to interrupt the closing of the lift door by pressing the "Door Open" then the lift door will re-open. However if these door closing were interrupted for too long, the lift door will close at reduced speed. This is referred to as 'Force closing'.

e) Attendant box (bottom of COP)

There have various of keys located inside the attendant box for the maintenance purpose and strictly to be opened and operated by the lift technician or authorized person only.

| Attendant Button Switch | Turning this switch on will dissociate the lift from the group operation and will place the lift under the control of the lift attendant. Car calls are made as normal except that the lift door will start to close only when the 'S' button is pressed. Closing action of the door will be interrupted when pressure on the 'S' button is removed unless the door is fully closed. Once the lift runs it may stop to answer landing calls as well. To stop the lift from attending the landing calls, press the 'NS' button after each pressing of 'S' button. One UP and one DOWN button are provided below the 'S' and 'NS' buttons. This is for the operator to decide on the direction of travel. Pressing the UP down will determine the car moving in the UP direction and vice versa but this can only be down before pressing the 'S' button. NOTE: Attendant operation is particularly suitable for moving material in and out of the lift as the entire lift operator. |
|------------------------------|--|
| Reservation Button Switch | Turning this switch on will dissociate the lift from the group operation and will place the lift in independent or reservation mode. In this mode, the lift answer one and latest car call at a time. Landing calls will not be answered. NOTE: Reservation mode is recommended for VIP use where speed and uninterrupted transport is priority. Note that as the lift is of simplex operation, operating this lift in reservation mode will deprive other users from making a hall call. |
| Lighting switch | Use this switch to turn on and off the light in the lift car. This feature is set it at auto mode. |
| Ventilation switch | Use this switch to turn on and off the fan mounted on top of the lift car. This feature is set it at auto mode. |

3.1.3 LANDING BOARDS

Call for car at the landing is made by pressing the appropriate button on the landing board. Call is registered once the registration light is lit. The registration light remains lit until the call is answered.

Note that the choice of touching the UP or DOWN button depends upon where you wish to go, NOT touching both UP and DOWN buttons or trying to determine the car position and pressing the UP button if the car is at floor below you. Making unwarranted calls will result in unnecessary stopping of the lifts thereby increasing your waiting time and the travelling time of the lift passengers.

3.1.4 FLOOR INDICATORS

These are provided centrally above the landing doors. The floor indicators are of Greencoloured LEDs and figures shown reflect the position of the lifts at any one time.

3.1.5 CAR PLATFORM AND FRAMING

The car platform consists of a structural steel frame of such strength and rigidity that it does not distort under varying loading conditions. The car platform is made of steel sheeting and is seated onto the bottom structural member via isolation rubber. The front portion of the platform is the aluminium sill.

3.1.6 CAR ENCLOSURE

The car walls are made of sheet metal and together with the roof formed the car enclosure. The material, size and design of the enclosure complied with the local authority requirement. The roof has provision of an emergency exit. This exit is used for rescue operation in an emergency situation and can only be opened from the top of the lift car. Opening the exit will disable the running of the lift. The car door operator, door hanger and mechanical links are mounted on the front of the roof.

3.1.7 <u>GOVERNORS</u>

The function of the governors being to detect lift car speed exceeding the rated governor speed and to activate the car safety gear (described below). It consists of the rotating flywheel and the sheave. The sheave and the flywheel rotation is produced when there is movement of the governor rope. Upon the speed of the governor rope (reflecting the speed of car) exceeding the rated governor speed, the flywheel will cause a mechanism to grip onto the governor rope. This will produce a jerking movement, causing a pulling action of the safety gear.

3.1.8 SAFETY GEAR

Each lift car is fitted with safety gears (one on each side of the car) mounted at the bottom of the car sling. When the safety gear engages, it will bring the lift car to a stopping distance within the requirement by the Factories and Machinery Department. The safety gear wedge will clamp onto the guide rails when it operates. The safety gear operates when the hoisting ropes break resulting in a free-fall condition or in the event of a runaway car. Under such situation the flyweights in the governor will trip the safety links once the car over-speed (exceeding the rated governor speed). This will then engage the safety gear. Note that the safety gear will only operate in a descending car.

3.1.9 GUIDE ROLLERS / SHOES

Guide roller or shoe are mounted on top and bottom of the car slings and the counterweight frames. These act as guide to the lift cars and counterweights as they move in the upward and downward direction.

3.1.10 INTERCOM AT SUPERVISORY PANEL

1 master intercom set is installed in Fire Control Room. Slave units are installed at the back of each of the car operating panels. The master intercom together with the slaves forms effective communication between supervisory room and lift motor-rooms and the lift cars. The features of the master intercom for the supervisory is as shown overleaf.



- (1) Handset Communication is voice activated and this feature allows for confidentiality during communication. May not be applicable on some models of intercom.
- (2) Power LED Lights up when power switch (8) is turned on.
- (3) Microphone Picks up the voice during speaking.
- (4) Speaker
- (5) Pre-setting volume controls
- (6) OFF button Button should be in a depressed position to receive incoming calls. Button 'pops' out when the station selector button is pressed (7).
- (7) Station selector button Press to answer incoming calls
- (8) Power switch Turning this on lights up (2).
- (9) Volume control for receive volume.
- (10) Volume control for call tone
- (11) ALL CALL button Pressing this will enable communication to all the station.
- (12) TALK button When not using the handset, press this continuously to speak.
- (13) Transmitter monitor LED
- (14) Selection indicator
- (15) Director card Labelling for the station
- (16) Call annunciator LED Call tone will buzz and appropriate LED lights up when there is incoming call.

The intercom set is connected to emergency battery supply. Therefore the intercom is operational during power failure. To clean the intercom, use soft cloth dampened with neutral household cleanser. Never use thinner nor benzine etc.

3.1.11 LOBBY VISION

This refers to the electronic information showing the lift operation. This information is available in the form of computer graphic which is displayed over the computer's monitor installed in the Fire Control Room. This project includes this features.

3.1.12 WARNING NOTICE

For the safe usage of the lift by the general public, the following safety measure have to be observed:

a)Children below school age using the lift must be accompanied by an adult.

- b) The maximum weight or number of persons specified in the contract load must not be exceeded.
- c)Should the passenger be trapped in the lift, do not attempt to leave the car; instead summon help by pressing the "Alarm" button and speak through the intercom system.
- d) Do not use the lift in the event of fire in the building. We recommend that the above notice be displayed prominently at the lift lobby to educate the general public.

3.2 OPERATION INSTRUCTION

3.2.1 INSPECTION OPERATION

By means of a change-over switch, the lift operation is modified to eliminate all normal operating devices, automatic levelling and power door operation; and the car shall move at a speed of not more than 50 fpm. An emergency stop button, "UP" and "DOWN" buttons are supplied. These are mounted on the lift car top and at the lift controller. However at any one time, only one number of the change-over switch can be turned on to inspection mode. **NOTE: Only Schindler technicians or trained maintenance personnel are allowed to operate the lift under inspection mode.**

3.2.2 FIRE EMERGENCY RETURN

In the event of fire in any part of the building, the fire signal is sent to the lift controllers. This will initiate the return of the lifts (except those that are under maintenance or placed under inspection modes) to the main landing.

3.2.3 FIREMAN'S LIFT OPERATION

NOTE: This operational mode is to be made use by the fireman only.

After the lift or lifts had been recalled as described in item 3.1.7, the fireman can make use of the designated fireman's lift by turning on the fireman's switch located at main floor. The lift can then be operated in the following manner.

i) Only one car call can be made at a time.

ii) The lift door does not close automatically. Door closing is by pressing the 'DOOR CLOSE' button.

iii) Lift will begin travel after the door is closed and will stop at the called floor. However lift door will not open unless the 'DOOR OPEN' button is pressed. It will continue to open to the maximum unless the pressure on the 'DOOR OPEN' button is removed.

iv) The lift will remain parked at that floor unless steps (i) and (ii) are repeated.

Note that the above description is not applicable if there is no fireman's lift.

3.2.4 EMERGENCY POWER OPERATION

During a power failure, a travelling lift will come to an abrupt stop. Only the designated light will operate from the standby battery supply. The lift will remain stationary until the standby generator feeds in power to the electrical system. The lifts

will then operate in either of the below mentioned modes pending on the design of the generator.

a) If the design of the generator is sufficient to operate all the lifts, then the lifts will operate as normal condition.

b) If the generator design is such that the power available is sufficient to operate selected lifts, then the lifts will return one at a time to park at the main floor. After all the lifts have parked at the main floor, the selected lifts will operate as normal.

3.2.5 CAR AND HOISTWAY DOOR OPERATION

The door operator motor is of A.C. Squirrel cage induction motor. The rotation of the motor is converted to linear motion for the car door via mechanical belting. Therefore operation of the operator motor opens the car door. Opening and closing speed of the car door is adjustable within certain range. On the left car door panel is clutch that engages onto the landing door rollers at each landing. Therefore the landing door is pulled along with the car door each time it opens.

The landing doors are made of sheet metal and has rollers mounted on top and guide shoes at the bottom. The rollers ride on door tracks and shoe movement are guided by the door sills. The landing doors are provided with mechanical interlocks and switches. Mechanical interlocks prevent door from forcibly opened from outside unless with a special door key. Electrical switches at the door stop the lift operation upon accidental opening of the landing door during the normal lift travel.

After a stop is made, the doors remain open for a predetermined interval unless closing is interrupted by the door sensor. The door sensor is an electronic detector which upon interruption by a passenger entering or leaving the car will cause the door to stop and reopen.

If the doors are prevented from closing for a preset interval, the electronic detector is rendered inoperative to cause door reversals. The doors will proceed to close at reduced speed accompanied by a buzzer. The electronic detector is by-passed when the lift is operated under attendant mode.

3.2.6 <u>KEYS</u>

The following keys are required for the various lift operation.

| COP Panel's Key Fan/light/attendant & Reservation Buttom switch. | - 1 set of this key will be provided. |
|---|--|
| Landing door key | - This key facilitates the manual opening of the landing doors. This is used mainly |
| | during rescue operation or lift servicing |
| | and maintenance. |
| | NOTE: Only Schindler techniciana will be |

NOTE: Only Schindler technicians will be provided with this key. The lift will come to an abrupt stop when the landing door is open during the normal travel of the lift.



3.3 List of equipment installed

Figure 2:

Power transmission

The motor (1) drives the traction sheave (2), which transmits the force to the car (14) by the suspension ropes (3).

Safety components

The **safety gear** (10) on the car brakes the car (14) if it ravels downward or upwards at excessive speed. The safety gear (10) is tripped by the speed governor (12).

The **traction sheave brake** on the motor (1) brakes the car, if it travels upwards at excessive speed. The traction sheave brake is triggered by the speed governor (12).

The **speed governor** (12) monitors the speed of the car (14) and it triggers the safety gear (10) or the traction sheave brake at excessive speed.

The **buffer** (13) brakes the car (14) in the event of over travel into the hoistway pit.

The **door interlock** (8) prevents the landing doors (7) and car door (9) from opening during travel and when outside the interlock zone. A combined car door locking for car doors with distances between car and landing door < 150mm is available as a so called car door lock.

Safety Circuit

The safety circuit monitors all electrical safety elements upon the functionality. Whenever an electrical safety element doesn't work correctly, the start of a trip will be prevented or the trip will be immediately stopped.

4. Operation of the Installation 4.1 Basic lift installation and component

4. Operation of the Installation

4.1 BASIC LIFT INSTALLATION AND COMPONENTS

Overview of a lift installation with machine room.

A typical lift installation will comprise of the following:

- a) Lift motor-room installation This is the room where the lift motors and controllers are installed. In most of the lift design, this room is located above the lift shaft. The size of the room must be sufficiently big to house the lift motors and controllers and enough space for proper maintenance work.
- b) Lift shaft installation The lift shaft forms part of the building structure. This houses the lift guide rails on which lift cars and counterweights 'glides' up and down, where the lift door frames and doors are attached and where the lift travelling cables, compensating chains and wire rope are suspended. This building structure has to be constructed accurately and vertically otherwise it might pose problem when installing the lift equipment.
- c) Lift pit installation The lift pit is the lowest part of the lift shaft and it extends below the lowest landing. Quite often this is also the lowest part of the building structure. The lift buffers, governor tension pulley, compensating chain guide are installed in this place. The depth of the pit must be sufficiently deep to cater for the lift over-travel.



| 4.1.1 | CAR | | |
|--------|------------------------|---|--|
| | Туре | Single deck car with one entrance for all lifts except executive lift with two entrances. | |
| Design | | Car wall and floor fixed onto car sling via isolation rubbers. | |
| | Ceiling & Lighting | Passenger and Fireman lifts ceiling is fixed with plasterted ceiling with direct halogen lights. These works done by others for all passenger lifts | |
| | Walls | 3 sides of car walls are fixed with hairline stainless steel panels. | |
| | Door | Door operator motors mounted on top of the lift car, opens and closes the car doors via cams. The car doors are cladded with hairline stainless steel. | |
| | Floor | The steel floorings were isolated from the car slings. Load weighing were done using strain gauges and electronically calibrated. However, some of lifts are using limit switch. Floor are finished with Homogeneous tiles. | |
| | Ventilation | Fans are mounted at the lift car top to provide the ventilation to the internal of lift car. | |
| 4.1.2 | .1.2 LANDING DOOR | | |
| | Туре | The lifts are provided with fully automatic two panel center-opening door. | |
| | Operator | A quiet A.C. motor mounted on the car top drives the door system. Through a system of mechanical linkages, the car door is driven open. Landing door is pulled open synchronically via coupling cam. | |
| | Landing Door Panels | Sheet steel with stiffeners forms the door panels. The landing doors are cladded with hairline stainless steel at all floors. | |
| | Landing Door Frames | The door frame design is 50x50 type. These are cladded with hairline stainless steel at all floors. | |
| 4.1.3 | DRIVE | | |
| | Туре | AC VVVF gearless drive system is used to provide the lift traction. | |
| 4.1.4 | MACHINE | | |
| | Hoist motor | PMS 420 Gearless Machine helps reduce energy costs, delivering 95% efficiency at lower heat dissipation levels. | |
| | Sheaves | 450 mm diameter traction sheave is mounted to the gear flange. Double wrap roping design is used for transmission of force from the machine to the suspension ropes. | |

| | Brake | Electro-mechanically opened disk brake to hold the load and to act as an emergency brake. A micro switch detects the state of the brake, whether open or closed, for the drive should not start against a closed brake. |
|-------|--------------------------|--|
| | Machine mounting | Comprises of the base-plate and isolation pads supporting the C-channel beam |
| 4.1.5 | CONTROL | |
| | Miconic MX-GC Systems | The space saving Miconic MX-GC control system utilize Schindler's exclusive Global Control(GC) platform to meet the most demanding building traffic challenges. Neuron chip based LON bus communication is supplied as standard. |
| | Transducers | Car position controls resolve distance to 0.5 mm increments. Position signals from the Primary Position Transducer thus assuring fast but smooth rides and accurate stops within less than +/- 4mm of the floor. |
| | System Bus | A special 5-wire parallel bus permitting the microprocessors to jointly perform the supervisory control function links the car controllers. This makes the greater part of each processor's capacity available for dispatching purposes. (Above is not applicable for simplex control) |
| | Dispatching | Decentralized dispatching and Miconic-MX-GC Bus give the group greater dispatching power, superior availability and permit the system to evaluate more traffic parameters for each floor-to-floor assignment decision. Cars will be assigned to floors based on "cost of service". The system will assign the car, which will cause the lowest "cost" by serving the floor. Cost is defined in "passenger seconds", or in total passenger delays. The system target is minimizing these delays, thus maximizing system efficiency. The system will respond to traffic conditions and modify its assignments procedures to operate in the following modes: a) Light/Intermittent /Up-Peak/Noon-Peak/Down Peak. In the "Light" mode cars are parked in predetermined zones of the building. 1 or 2 cars will park at the main floor. One main floor will park with its doors open. In the "Intermittent" mode cars split zones at the half-way point between each other, each car serving the floors to which it is closest. Once the car is committed to travel in one direction it will become "low bidder" for calls ahead, but "high bidder" for calls behind. Hall calls will be assigned to the lowest bidder. Cars will complete service in one direction before reversing and are permitted to reverse at the highest or lowest call. Cars will return to the unoccupied parking zones when idle. The "Up-Peak" mode is initiated when two cars leave the main floor in the up-direction with loadings above a predetermined level and increasing. This will attract additional cars to park at the main floor. Cars are permitted to depart at the main floor without pre- determined level and increasing. This will ot a load |

| | | approximately 20% above the previous car's departure loading, it will extinguish its hall lantern and activate the next car. |
|-------|--------------------------|--|
| | | During the Up-Peak mode, down hall calls will be served by cars not immediately needed to serve up-traffic. The "Down-Peak" condition will be detected by monitoring the number of down hall calls, down boarding rates and down lobby arrival loadings. Under heavy down peak traffic, hall calls are grouped in the sequence of restriction and assigned to be served in this sequence, an approximate "first-in/first-out" pattern. This procedure reduces both waiting times and times to destination. A "Noon-Peak" situation is recognized when both Up- peak and the Down-peak conditions are detected. The number of cars sent to the lobby to serve incoming traffic will be reduced – compared to pure "Up-Peak"- and no limitations will apply to service for down hall calls, but the "first-in/first-out" sequence in serving hall calls will be applied when necessary. (The above is not applicable for simplex control.) |
| | Dispatch Protection | Should one car be disabled, another car will take over immediately. (The above is not applicable for simplex control.) |
| | Hall Call Protection | If a car microprocessor failure, its hall calls will be served as continuous calls by the remaining group according to the normal supervisory procedure. (The above is not applicable for simplex control) |
| | Independent Operation | This feature is available for all lifts and can be turned ON by using a key switch. Cars are parked with doors opened and respond to car calls only. (Adjustment for their removal from group service are made automatically by the remaining cars.*) * This is not applicable for simplex control. |
| | Disabled Operation | Cars unable to operate are automatically removed from group. (Remaining cars automatically adjust for their removal). (The above is not applicable for simplex control) |
| | Door Monitoring | Should the door be prevented from closing after normal door timing expires, the door will close at reduced speed irrespective of the door protection devices. |
| | Maintenance Control | Lift can be run on inspection speed if the selector switch at the lift car top or at the lift controller is turned to "Inspection" and that when either the UP or DOWN button is pressed. A stop button is also provided. |
| 4.1.6 | FIXTURES | |
| | Car Operating Panel | 1 no. is provided for each lift car. The panels can be opened by giving them a upward lift. Enclosed please find sketches of the features available on the car operating panel. |
| | Landing Board | 1 call button at terminal floors and 2 buttons for intermediate floors. |

| | | 1 "UP" and 1 "DOWN" for intermediate floors. The buttons are mounted on stainless steel face-plates. Type of button used is D-push type and has a greenish registration light to indicate call is made. |
|-------|--------------------------------|--|
| | Hall Lantern | Digital floor indicators mounted on the centre of hairline stainless steel faceplates are provided at every floor. The faceplates are position at the centre of the stainless steel transom. The indicator type used is Module A type |
| | Supervisory Display | Comprises of the following. a) Lobby vision is provided b) Intercom for 3 ways communication with passengers in individual lifts and lift/maintenance personnel in the lift motor-rooms and also at the Fire Control Room. (Academic only) |
| 4.1.7 | HOISTWAY EQUIPMENT | |
| | Guide Rails | Appropriate sizes of machined T shaped guide rails were installed for the car and counterweight. Rails were mounted to the building structure using expansion bolts, angle brackets, clips and fastenings. |
| | Hoisting Ropes | 11 mm diameter steel wire rope is used as hoist ropes. 8 nos of ropes are installed per lift using the 2:1 system for all lifts. |
| | Compensating Ropes / Chains | Compensating ropes / chains are used to compensate the weight of the hoist ropes of the lifts. These are hung from the bottom of the cars to the bottom of the counterweights frame. Compensation also reduces on the energy consumption, improve the stopping accuracy and increase safety. |
| | Governor Ropes | 6 mm diameter steel rope were used. The two ends were securely linked to the car or counterweight and attached to the safety gear operating lever. The tension of the rope is carried out by means of weight- loaded device located in the hoist-way pits. |
| | Over-speed Governor | The over-speed governor is a direct-driven, disc type centrifugal force operated type, with rope-clamping jaws and over-speed and trip contacts. |
| | Safety Gear | Safety gears are mounted at bottom of car frame and counterweight frame. If the permissible speed is exceeded, the speed governor will activate the safety gear to bring the car to a standstill quickly and safely. The safety gears are set individually at the factory such that when the braking force is applied, it will bring the car to a quick stop within permissible retardation limits. |
| | Counterweight | The assembly consists of the frame and the filler weights. The counterweight is used to balance the |

| | weight of the car and half the contract load. |
|--------|---|
| Buffer | Oil/spring type buffers are used. These are mounted on concrete plinths cast in position at the lift pits. These are positioned beneath the cars and the counterweights. |

PERKHIDMATAN PENGOPERASIAN, SERVIS BERJADUAL DAN PENYELENGGARAAN SECARA KOMPREHENSIF UNTUK SISTEM-SISTEM LIF PENUMPANG JENAMA SCHINDLER DI UNIVERSITI TEKNOLOGI MARA (UITM) KAMPUS SUNGAI BULOH, SELANGOR DARUL EHSAN BAGI TEMPOH SATU (1) TAHUN

| No. | No. Siri | Lokasi | Brand | Car Size |
|-----|----------|------------------------|-----------|-----------------------|
| 1 | PL-1 | Akademik | Schindler | 2100 x 2400 x 2900 mm |
| 2 | PL-2 | Akademik | Schindler | 2100 x 2400 x 2900 mm |
| 3 | PL-3 | Akademik | Schindler | 2100 x 2400 x 2900 mm |
| 4 | PL-4 | Akademik | Schindler | 2100 x 2400 x 2900 mm |
| 5 | PL-5 | Akademik | Schindler | 2100 x 2400 x 2900 mm |
| 6 | PL-6 | Akademik | Schindler | 2100 x 1700 x 2900 mm |
| 7 | PL-7 | Akademik -Perpustakaan | Schindler | 1650 x 2200 x 2900 mm |
| 8 | PL-1 | Kolej Kediaman 2 | Schindler | 2100 x 2400 x 2900 mm |
| 9 | PL-2 | Kolej Kediaman 2 | Schindler | 2100 x 2400 x 2900 mm |
| 10 | PL-3 | Kolej Kediaman 2 | Schindler | 2100 x 2400 x 2900 mm |
| 11 | PL-4 | Kolej Kediaman 2 | Schindler | 2100 x 2400 x 2900 mm |

Appendix 1 : Inventory List

TECHNICAL SPECIFICATION OF LIFTS

| <u>LIFT NO.</u> | : <u>PL-1-7</u> |
|------------------------|----------------------|
| a) TYPE OF LIFT | : Passenger |
| b) NO OF LIFTS | : 1 |
| c) LOAD/PERSONS | : 1635 kg/24 persons |
| d) SPEED | : 1.75 m/s |
| e) TRAVEL | : 27.5 m |
| f) NUMBER OF STOPS/ EN | NTRANCES : 7(1-7) |
| g) EMERGENCY DOOR EN | ITRANCES : NIL |
| h) DRIVE | : ACVVVF Gearless |

i) POWER SUPPLY

: 415V +/- 5% 50HZ 3PH (4 wire+earth) 240V 50HZ 1PH(wire+earth)

j)CONTROL SYSTEM

:

Miconic Microprocessor Duplex Collective Selective Overload Full load by-pass Car fan/light automatic off Reservation Parking Lift alarm Door final timer Anti-nuisance Attendant Intercom system Fireman's control Fireman's switch – Not provided at this group Emergency power control

| k) MACHINE ROOM POSITION | : Directly above lift shaft |
|---|--|
| l) POWER RATING | : 18.9 kw (approximately) |
| m)PIT DEPTH (min) | : 2000 mm |
| n) OVERTRAVEL | : 5000 mm |
| o) MACHINE ROOM HEIGHT | : 3000 mm |
| p) SHAFT SIZE(WxD) | : 2600 x 2400 mm |
| q) CAR SIZE (WxDxH) | : 2100 x 2400 x 2900 mm |
| r) LANDING DOOR | : Automatic two panels centre-opening |
| Main & Other floors | : Hairline Stainless Steel |
| s) LANDING DOOR FRAMES Main & others floors | : Narrow frames (50 x 50mm) and |
| | Cladded with Hairline Stainless Steel |
| t) IKANSUM | : Hairline stainless steel |
| u) LANDING BOARD | |

AND INDICATOR/ HALL LANTERN :

> -Schindler D push button with Braille (Black colour base) -Digital position indicator with further direction indicator above doorway

-Indicator faceplate in hairline stainless steel

-Concealed pre-arrival gong

| LIFT NO. | : <u>PL-2</u> |
|-----------------|----------------------|
| a) TYPE OF LIFT | : Passenger |
| b) NO OF LIFTS | : 1 |
| c) LOAD/PERSONS | : 1635 kg/24 persons |
| d) SPEED | : 1.75 m/s |
| e) TRAVEL | : 27.5 m |

h) NUMBER OF STOPS/ ENTRANCES : 7(1-7)

i) EMERGENCY DOOR ENTRANCES : NIL

| h) DRIVE | : ACVVVF Gearless |
|-----------------|---|
| i) POWER SUPPLY | : 415V +/- 5% 50HZ 3PH (4 wire+earth) 240V 50HZ 1PH(wire+earth) |

j) CONTROL SYSTEM :

Miconic Microprocessor Duplex Collective Selective Overload Full load by-pass Car fan/light automatic off Reservation Parking Lift alarm Door final timer Anti-nuisance Attendant Intercom system Fireman's control Fireman's switch – Not provided at this group Emergency power control

| k) MACHINE ROOM POSITION | : Directly above lift shaft |
|---|---|
| l) POWER RATING | : 18.9 kw (approximately) |
| m)PIT DEPTH (min) | : 2000 mm |
| n) OVERTRAVEL | : 5000 mm |
| o) MACHINE ROOM HEIGHT | : 3000 mm |
| p) SHAFT SIZE(WxD) | : 2600 x 2400 mm |
| q) CAR SIZE (WxDxH |) : 2100 x 2400 x 2900 mm |
| r) LANDING DOOR | : Automatic two panels centre-opening |
| Main & Other floor | (W x H) 1100 x 2100 mm s : Hairline Stainless Steel |
| s) LANDING DOOR FRAMES | |
| Main & others floors | : Narrow frames (50 x 50mm) and Cladded with Hairline Stainless Steel |
| t) TRANSOM | : Hairline stainless steel |
| u) LANDING BOARD AND INDICATOR/ HALL LANTERN | : |
| | -Schindler D push button with Braille (Black colour base) -Digital position indicator with further direction indicator |

above doorway -Indicator faceplate in hairline stainless steel -Concealed pre-arrival gong

| <u>LIFT NO.</u> | : <u>PL-3</u> |
|-----------------------------|---|
| a) TYPE OF LIFT | : Passenger |
| b) NO OF LIFTS | : 1 |
| c) LOAD/PERSONS | : 1635 kg/24 persons |
| d) SPEED | : 1.00 m/s |
| e) TRAVEL | : 9.5 m |
| j) NUMBER OF STOP | S/ ENTRANCES : 3 (1-3) |
| k) EMERGENCY DOO | PR ENTRANCES : NIL |
| h) DRIVE | : ACVVVF Gearless |
| i) POWER SUPPLY | : 415V +/- 5% 50HZ 3PH (4 wire+earth) 240V 50HZ 1PH(wire+earth) |
| j)CONTROL SYSTEM | : |
| | Miconic Microprocessor Duplex Collective Selective Overload Full load by-pass Car fan/light automatic off Reservation Parking Lift alarm Door final timer Anti-nuisance Attendant Intercom system Fireman's control Fireman's switch – Not provided at this group Emergency power control |
| k) MACHINE ROOM POSITION | : Directly above lift shaft |
| l) POWER RATING | : 18.9 kw (approximately) |
| m)PIT DEPTH (min) | : 1700 mm |

| n) OVERTRAVEL | : 4900 mm |
|---|--|
| o) MACHINE ROOM HEIGHT | : 3000 mm |
| p) SHAFT SIZE(WxD) | : 2600 x 2400 mm |
| q) CAR SIZE (WxDxH |) : 2100 x 1700 x 2900 mm |
| r) LANDING DOOR | : Automatic two panels centre-opening |
| Main & Other floors | s : Hairline Stainless Steel |
| s) LANDING DOOR FRAMES | |
| Main & others floors | Narrow frames (50 x 50mm) and Cladded with Hairline Stainless Steel |
| t) TRANSOM | : Hairline stainless steel |
| u) LANDING BOARD AND INDICATOR/ HALL LANTERN | : |
| | -Schindler D push button with Braille (Black colour base) -Digital position indicator with further direction indicator above doorway |

above doorway -Indicator faceplate in hairline stainless steel -Concealed pre-arrival gong

| <u>LIFT NO.</u> | : <u>FL-1</u> |
|-----------------|----------------------|
| a) TYPE OF LIFT | : Fireman Lift |
| b) NO OF LIFTS | : 1 |
| c) LOAD/PERSONS | : 1635 kg/24 persons |
| d) SPEED | : 1.75 m/s |
| e) TRAVEL | : 27.5 m |
| | |

1) NUMBER OF STOPS/ ENTRANCES :7(1-7)

m) EMERGENCY DOOR ENTRANCES

: NIL

:

| h) DRIVE | : ACVVVF Gearless |
|-----------------|---|
| i) POWER SUPPLY | : 415V +/- 5% 50HZ 3PH (4 wire+earth) 240V 50HZ 1PH(wire+earth) |

j)CONTROL SYSTEM

Miconic Microprocessor Duplex Collective Selective Overload Full load by-pass Car fan/light automatic off Reservation Parking Lift alarm Door final timer Anti-nuisance Attendant Intercom system Fireman's control Fireman's switch Emergency power control

| k) MACHINE ROOM POSITION | : Directly above lift shaft |
|-----------------------------|-----------------------------|
| I) POWER RATING | : 18.9 kw (approximately) |
| m)PIT DEPTH (min) | : 2000 mm |
| n) OVERTRAVEL | : 5000 mm |

| o) MACHINE ROOM HEIGHT | : 3000 mm |
|---------------------------|---|
| p) SHAFT SIZE(WxD) | : 2750 x 2950 mm |
| q) CAR SIZE (WxDxH) | : 1650 x 2200 x 2900 mm |
| r) LANDING DOOR | : Automatic two panels centre-opening (W x H) 1100 x 2100 mm |

| Main & Other floors | : Hairline Stainless Steel |
|---|---|
| s) LANDING DOOR FRAMES | |
| Main & others floors | : Narrow frames (50 x 50mm) and Cladded with Hairline Stainless Steel |
| t) TRANSOM | : Hairline stainless steel |
| u) LANDING BOARD AND INDICATOR/ HALL LANTERN | : -Schindler D push button with Braille (Black colour base) -Digital position indicator with further direction above doorway -Indicator faceplate in hairline stainless steel -Concealed pre-arr |