



**GAUTENG PROVINCE**  
INFRASTRUCTURE DEVELOPMENT  
REPUBLIC OF SOUTH AFRICA

**Tender No: DID**

## **PART 1**

### **REMOVAL, SUPPLY, DELIVER, INSTALL AND COMMISSIONING OF ONE LIFT AT VILA HEIDI RESIDENCE UNDER GERMISTON HOSPITAL**

#### **SPECIAL CONDITIONS OF TENDER**

##### **1.0 SCOPE OF CONTRACT**

1.01 The removal, disposal, supply and installation of 1 lift at Villa Heidi residence under Germiston hospital

1.02 2 year maintenance contract

##### **1.1 CONDITIONS**

The supply of all necessary equipment and labour for the duration of the contract should be in accordance with this specification.

All staff of the Tenderer shall, upon arrival and departure report only to the authorized representative of Department of Infrastructure Development on site. These persons will be identified to the successful tenderer at the commencement of the contract.

##### **1.2 SITE**

The site shall be Villa Heidi residence under Germiston hospital



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## **PART 2**

### **LIFT SPECIFICATION**

#### **2.1 GROUP AUTOMATIC OPERATION – TWO OR MORE LIFTS IN GROUP**

- 2.1.1 The operation for groups of lifts shall be group automatic operation arranged, dispatched and controlled by a de-centralised group supervisory system. The lift system control shall be supervised by a flexible and intelligent re-programmable minicomputer or microprocessor system and re-programming shall be possible without making changes to the lift hardware or fixed wiring.

#### **2.2 AUTOMATIC LANDING CALL BY-PASS**

- 2.2.1 When the car loading exceeds a predetermined level, it shall automatically bypass all landing calls in the direction of service and shall respond only to car calls.
- Default setting: **65% of rated load**

#### **2.3 CAR HELD UP AT A LANDING**

Should a lift be delayed at a typical floor beyond pre-set software adjustable time period initially set at **Thirty (30) seconds**, the lift shall be disconnected from the group automatic operation and the assigned landing calls shall be re-assigned to an alternative operational lift.

#### **2.4 CAR CALL CANCELLING**

When the car has responded to the last call in the up or down direction, the car calls shall automatically be cleared from the system to maintain optimum efficiency.

#### **2.5 LOAD WEIGHING**

- 2.5.1 Each lift shall be provided with a strain gauge type load-weighing device to ensure optimum service.

#### **2.6 ANTI-NUISANCE CONTROL**

When a lift with a loading level of less than **10-kg** arrives at a landing, all car calls shall be automatically reset.

#### **2.7 OPERATION WITH INDEPENDENT SERVICE**

- 2.7.1 A two-position Independent service key operated switch, with cylinder as approved by the Consulting Lift Engineer and Principal Agent and master-keyed to the building system, shall be readily accessible and mounted in the car operating station of each lift. When this switch is in the “On” position, the removal of the key from



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the barrel shall be prevented and the lift shall be operated from the car buttons only and independent of all other automatic or special operation modes.

**2.8 OPERATION WITH INSPECTION**

Provide a two-position switch on top of the car enclosure (car top working platform) to operate each lift manually during adjustment, inspection, maintenance and repair. The operating buttons shall be of the continuous pressure type and the speed of the lift when on inspection control shall **not exceed 0.63-m/s** and shall operate the car only when the car doors and all lift shaft doors are closed, and all safety circuits are operational.

**2.9 EMERGENCY OPERATION**

Provide a two-position switch in the motor room to operate each lift manually during emergency conditions, adjustment, inspection, maintenance and repair. The operating buttons shall be of the continuous pressure type and when on emergency operation, the speed of the lift shall **not exceed 0.63-m/s** and shall operate when the lift doors are closed, and when the inspection control on top of the car is switched to normal operation. It shall be permitted to over-ride the final limits, safety gear contacts, and governor contacts.

**2.9.1 AUTOMATIC LOWERING OPERATION DURING POWER FAILURE**

Provide a battery powered automatic lowering system which functions automatically in the event of a power failure. The automatic lowering system is to ensure that the lift is lowered to the nearest floor and opens the doors when floor level is reached. If the lift is not connected to backup generated power, the doors are to remain open and the lift is to remain stationary until such time that the normal power supply is returned to the lift.

**2.10 FIREMAN'S OPERATION**

**2.10.1 Fire recall – Level 1:**

- All lifts shall be equipped with Fire Control Level-1 and each group or single lift shall be equipped with a common Fire Control switch to recall the lifts (non-stop) to the nominated evacuation landing, where it shall remain parked with open doors. The switch shall be mounted in a box with a break-glass front marked "Lift Fire Control".
- When the fire control switch is activated, lifts travelling away from the designated landing, shall stop and reverse direction at the next closest floor without opening its doors, and return non-stop to the designated fireman's floor.



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- An illuminated indicator fitted inside the car shall indicate that the lift is on fire control and shall further instruct the passengers to evacuate the lift at the designated evacuation floor.
- When on standby power the fire control operation shall operate as detailed under this section in conjunction with the emergency standby power control sequenced evacuation.

**2.11 OPERATION WITH STANDBY POWER**

**2.11.1 Emergency recall to main landing – Level 1:**

- Provide a standby power operation which recognises the feeder arrangement and the standby power operation which automatically evacuates all lifts on each affected feeder by operating **One (1)** lift at a time to the main dispatching landing without responding to car or landing calls. The system shall subsequently permit automatic and manual selection of any lift to be released for normal operation with standby power.
- The lifts shall be capable of operation on standby power at **100%** of rated speed in both directions and **100%** of rated capacity without overheating.
- Provide all connections to the lift controls for standby power operation in the appropriate machine rooms and all the necessary interlocking interconnection wiring among machine rooms of different lifts.

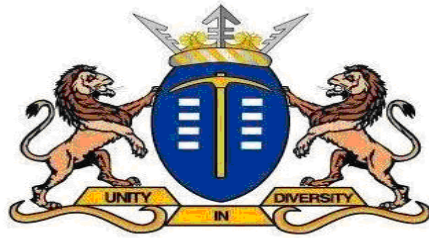
**2.11.2 Emergency Control Cables/Wiring:** Provide all the cabling and the installation thereof to link motor rooms and control room. The site and relevant drawings shall be checked to determine the route and lengths of cable required. It is anticipated that the existing cabling shall be re-used or extended as required.

**2.12 OVERLOAD PROTECTION**

Provide overload protection for all lifts. If the load in the car enclosure exceeds the rated load, a buzzer shall sound, an overload Indicator will illuminate in the car-operating panel to indicate this condition, the lift doors shall remain open and the lift blocked from travelling. The overload device shall not be active during the travel phase of the lift.

**2.13 DRIVE CONTROL**

**2.13.1** Provide fully regulated distance dependant **closed loop AC VVVF** drive control system capable of constantly maintaining the floor levels and ride quality as specified. Lift acceleration, nominal speed and slowdown phases shall constantly be monitored and controlled against and with reference to, distance, speed, current and voltage feedback loops. The lift drive shall be capable of bringing the lift to a standstill after travel without a creeping-in or levelling-in phase (direct approach).



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2.13.2 Driving machine and motor shall be controlled to operate the lift continuously at **100%** of contract speed in both directions without overheating or hunting during levelling.

2.13.3 **Levelling Tolerance:** Provide equipment to maintain levelling as shown below:

- Levelling Accuracy: **3-mm** maximum
- Re-levelling Accuracy: **3-mm** maximum

#### **2.14 TRAFFIC HANDLING**

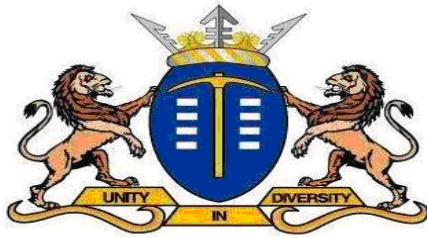
The lift, drive and group controls shall constantly deliver the traffic handling performance times and percentages as specified herein.

#### **2.15 DUTY RATE –TRIP COUNTER**

In order to evaluate the duty rate (usage factor) in terms of the specification and subsequent maintenance agreements, provide external trip counters on each lift controller. Trip counters incorporated in to the lift control software if not easily accessible to building management personnel shall not be regarded as sufficient in terms of this section. As a minimum, the trip counters to incorporate a re-settable **7-digit** dual function display:

- Function-1: Record the total trips / starts - not re-settable
- Function-2: Re-settable trip counter

2.15.1 **Back-up Software:** Keep safe at a local office, full back-up software for the lift controls and remote monitoring system. Software replacement shall be deemed to be included under future maintenance agreements unless the replacement of the software resulted from abuse or misuse of the equipment. It shall be accepted that by purchasing the lift equipment, the Employer has already paid for all development costs associated with replacement software.



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## **PART 3: EQUIPMENT**

### **3.1 EQUIPMENT AND LOCATION**

- 3.1.1 Lifts with machines located directly over the lift shaft and machines below shall be mounted on steel beams on steel or concrete up-stands. Motor room less lift machines shall be mounted on steel beams at the top of the shaft and outside the projection of the car. Lifts to be supplied should have machines located directly over the lift shaft and motor room less lifts will not be accepted unless approval is given in writing by the Project Manager.
- 3.1.2 Provide all required templates, inserts and signal boxes in walls or floors.
- 3.1.3 Arranged that rotating elements, sheaves, etc., so that they can be removed for repairs or replacement, either by trolley hoist and dolly, or other conventional means, without dismantling or removing other equipment components in the same machine room.
- 3.1.4 Trolley beams shall not be utilised as the normal support of diverter sheaves.
- 3.1.5 Provide any additional structural members required for the installations of the equipment, such as shelf angles and steel beam supports for sheaves, governors, motor generator sets, controllers and dead-end hitch beams
- 3.1.6 Clearance around equipment located in each machine room shall comply with the applicable provisions of the relevant codes.

### **3.2 Sheaves Situated in the Shaft:** The Lift-Contractor shall provide all equipment necessary to meet the requirements of **SANS-1545** with regards to diverter sheaves situated in the shaft and positioned directly above the lift enclosure including but not limited to:

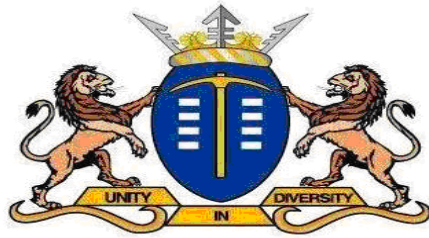
- Installation of working platforms to create separate sheave rooms if the existing head-room permits including sheave guards, lights and emergency stop switches.
- Supply and installation of remote activate / release governors if not accessible from outside the shaft.

### **3.3 HOISTING MACHINE**

#### **3.3.1 Traction Drives:**

- **Main Brake:** The main brake shall be spring applied and electrically released by direct current. The main brake shall have sufficient power to hold the car at any landing with the normal amount of counterbalancing and with at least **150%** of contract load.





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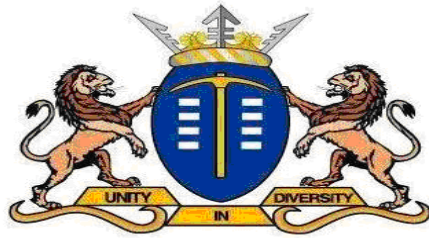
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- **Vibration Isolation:** Provide an effective sound reducing material / vibration isolation shall be installed between the bed-plate or supporting steelwork of an overhead, basement or motor room less driving machine and the beams, the structural concrete slab, shaft structure or the up-stands.
- **Duty Rate:** Driving machines, motors and drive controls shall have sufficient capacity to operate the lift continuously at **100%** of contract speed in both directions without overheating or hunting during normal operation and levelling.
- Equipment shall meet heavy usage requirements not less than the duty rates shown below:
  - **>= 240 starts per hour**
- **Noise and Vibration Levels for Conventional Machines:** Overhead and basement driving machinery situated in a machine room shall operate silently, without vibration and shall constantly maintain noise levels not **exceeding 56-DB (A)**. The machine noise level shall at all times remain at an acceptable level, shall be inaudible from the landings or the car enclosure and shall maintain the performance levels as specified herein.
- **Noise and Vibration Levels for Motor-Room-Less Lifts:** Motor room less driving machinery shall operate silently, without vibration and the noise generated by the control and machine on the landing shall not exceed **42-DB (A) maximum** and **38-DB (A) average**. The noise and vibration levels measured in the lift car shall not exceed the performance levels as specified herein.
- Provision shall be made for a safe method of moving the machine by hand in the event of a power failure. All the necessary equipment and signage required to carry out this task in terms of **SANS-1545**, shall be mounted neatly in the motor room and shall remain on site at all times.
- For protection against entanglement, a positive action emergency stop switch shall be supplied and installed in close proximity to the main driving sheave it controls.

### 3.4 CONTROLLERS

- 3.4.1 Provide re-programmable solid state operation and motion controller to control the operation, the starting, the stopping, the speed of the lift motor and to apply the brake automatically if any of the safety devices operate or the power fails. Three-phase protection shall be provided to the motor-generator set, driving motor or the solid state motion controller by the use of simultaneous tripping devices.
- 3.4.2 Provide solid state controllers enclosed in ventilated sheet metal cabinets with integral blowers. In order to maintain an acceptable control panel internal



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temperature, all power resistors and heat generating transformers shall be mounted in separate enclosures.

- 3.4.3 Each controller or the section of the controller supporting the main control contactors shall be vibration isolated from the motor room floor slab and building structure.
- 3.4.4 Provide only generic manufactured, assembled and supplied controllers and associated equipment.
- 3.4.5 Provide and install a Main Switch for each lift in a position where it is easily and rapidly accessible from the entrance to the machine room.
- 3.4.6 The Main Switch shall have a dual application namely:
- Motors connected directly to the mains shall be protected against short circuit. (Not required if motor protection is provided in the control panel),
  - The main switch shall be capable of breaking the supply to the lift by interrupting all the live conductors,
  - The main Circuit Breaker or Isolator provided in the motor room Distribution Board shall not be regarded as the Main Switch covered under this section,
  - The Main Switch shall not cut off the supply to the circuits feeding the car light, car ventilation and car, shaft, pit and motor room **220-volt** supply.
- 3.4.7 Control panels and machines of multi-lifts situated in a common area shall be clearly marked with numerical or alphabetical number at least **100-mm high**.

### 3.5 CONTROL SYSTEM

- 3.5.1 The control system shall be capable of constantly producing the performance criteria specified herein.
- 3.5.2 Provide drive control system capable of decelerating the lift to stand still without a levelling-in or creeping-in phase. Only lifts with direct floor approach capabilities shall be accepted.
- 3.5.3 Provide motor drive control units capable of providing a smooth acceleration, steady velocity and deceleration plus levelling to various floors within the time allowance and levelling tolerances as specified herein. This performance shall be consistent under all conditions of loading and in either direction of travel.
- 3.5.4 The motor drive unit control shall be equipped with all necessary monitoring circuits to maintain a safe and reliable operation. These shall include but are not limited to the monitoring of the load, direction of rotation, speed, supply voltage, and operating currents.





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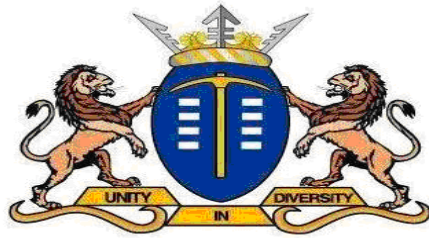
- 3.5.5 The hoist motor shall be provided with a thermostatically controlled blower if necessary, to dissipate the heat so as to maintain the equipment within the maximum operating temperature rise specified by the Manufacturer.
- 3.5.6 The control system shall provide a consistent operation with the levelling accuracy at all landings from no load to full rated load in the lift. The specified operation shall be maintained for all lifts under stable conditions at maximum car start to car stop and floor approach times as specified.
- 3.5.7 A maximum of **0.5-second** shall be allowed from door close to car start.
- 3.5.8 Equipment shall be designed to operate at plus or minus **10%** of normal feeder voltage and plus or minus **5%** of feeder frequency without interruption and protective devices to prevent damage to equipment on over or under-voltage shall be provided.
- 3.5.9 The control system shall be designed to operate the lift continuously at **100%** of contract speed and at **100%** of contract load in both directions without overheating or hunting.
- 3.5.10 Lifts shall be adjusted as required meeting the performance requirements as specified within **10%** tolerance.

### **3.6 MACHINE ROOM INDICATORS / ROPE MARKERS MONITORS AND TEST TOOLS**

- 3.6.1 **Monitors / Test Tools:** Monitor and key board or hand held testing instruments for commissioning, re-commissioning and fault analysis of the lift control systems shall be provided and shall remain on site at all times. If monitors are provided, each group of lifts shall be supplied with its own monitor.
- 3.6.2 **Emergency Floor Level Indicator:** As each lift travels through the lift shaft, its floor level position shall be indicated by a battery operated LED indicator mounted in a position clearly visible from the machine. This indicator shall operate independently to the lift control and shall not be dependent on the lift supply for its operation.
- 3.6.3 **Error logs:** The lift control system shall incorporate the equipment to generate error logs and fault reports. Error logs for each lift shall generate a history of at least **twenty (20)** of the most recent faults indicating the type of fault, lift number, date and time the fault occurred.

### **3.7. AUTOMATIC SELF-LEVELLING**

Provide lifts with both a self-levelling and a re-levelling controls to automatically bring the lift to the floor landings within a tolerance of **3.0-mm** under no load to full rated load conditions without hunting. Self-levelling shall within its zone, be entirely automatic and independent of the operating device and shall correct for



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over-travel and rope stretch. The lift shall be maintained approximately level with the landing, irrespective of load and while loading and unloading.

### 3.8 STOPPING DEVICES

3.8.1 Provide normal terminal stopping devices enclosed in dust-proof enclosures for each lift. These devices through operation shall bring the lift automatically to a smooth stop at the terminal landing.

3.8.2 **End of Shaft Final Limits:** Provide final terminal stopping device at the top and at the bottom of each lift shaft. A fixed cam securely attached to the lift shall operate these final limit switches. These limit switches shall be independent of any other stopping devices and shall positively open without the use of springs to cut off all power from the driving machine motor and brake and shall prevent the lift operation in either direction. Limit switches shall be so located that they operate before lift or the counterweight engages the buffer.

### 3.9 ROPE GUARDS

3.9.1 Rope guards shall be provided on machine sheaves, secondary or deflector sheaves and governor sheaves to cover moving sheaves and ropes. Provide guards on rope hole openings in machine room and secondary level floors to prevent objects from falling into the lift shaft. Provide guards in secondary level where ropes and tapes or selector drives pass through to prevent accidental contact.

3.9.2 Rope guards shall be fitted to the top of main divertor and governor sheaves mounted in the shaft, pit or under-slung sheaves protruding past the projection of the car.

### 3.10 CAR AND LANDING DOOR OPERATOR

**NOTE:** For the purpose of this specification the door operator shall be interpreted as the entire door operator including all associated components on the car and landing excluding the door panels and sills.

3.10.1 The door operator is regarded as a **CRITICAL ITEM** and it shall be the Lift-Contractor's responsibility to select and supply equipment considered by the Manufacturer as **top of the range, low maintenance equipment** which is capable of meeting the highest operation, duty rates and performance levels. Only door operator considered by the Manufacturer as **heavy-duty**, with continuous operation capabilities and a **redundancy factor of at least 1.5** shall be accepted.

#### 3.10.2 Duty Cycle:

- **Passenger Lifts:** Only door operators with heavy duty guide rails / tracks shall be accepted for Passenger Lifts.



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- 3.10.3 Incorrectly supplied or suspect door equipment with regards to clearly meeting the requirements shall be replaced with suitable equipment at no additional cost to the Client.
- 3.10.4 Appointment for the Contract shall not be considered as acceptance of the equipment offered and it shall remain the Manufacturer's responsibility to select, supply and install the correct equipment in terms of this specification.
- 3.10.5 Doors on the lift car and at each landing opening shall be opened and closed quietly and smoothly by a fully regulated electric motor and driving mechanism.
- 3.10.6 Car doors shall be mechanically locked when fully closed under power. It shall not be possible to force the car doors open from within the car and interrupt the safety contact when the doors are fully closed under power.
- 3.10.7 Provide mechanical car door locks where the free distance from the car sill to the shaft front wall exceeds **120-mm**.
- 3.10.8 The motion of the door operator shall be accomplished with arms and appropriate linkages to the approximate centre of gravity of the driven door panel.
- 3.10.9 Each landing door shall be equipped with electro-mechanical interlocks so that the lift can operate only when the interlock circuit is established.
- 3.10.10 Each landing door panel shall be closed by an independent auxiliary self-closing device (door closer weight) whenever the door is not in the closed position and it is not restrained by the equipment relating to the car and landing door system.
- 3.10.11 An electric contact for the lift car door shall be provided which shall prevent the lift moving away from a landing, unless the door is in the closed position.
- 3.10.12 An electrical contact shall be fitted to the non-driving car and landing doors if its linkage is dependent on a steel rope, belt or chain.
- 3.10.13 Emergency Triangle access key mechanisms shall be provided on each entrance.
- 3.10.14 The opening time and closing time for lift doors shall be within **10%** of the values specified herein.

**3.11 PASSENGER LIFT DOOR HANGERS**

- 3.11.1 Hangers shall be equipped with ball bearing adjustable rollers to take the up-thrust of the doors. The hangers and rollers shall be designed to accommodate the size and weight of the doors operated with a high-speed door operator.
- 3.11.2 Either the running surfaces of the tracks or the sheaves shall be non-metallic.



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- 3.11.3 Hollow or folded metal door tracks shall not be accepted, all door tracks are to be constructed of solid steel bar.

**3.12 CAR DOOR CONTROL**

**3.12.1 Door Motion Control:**

Only door operators with a fully regulated **VVVF** motion controller shall be accepted.

**3.12.2 Door Open and Close Times:**

Door open and close times shall be regulated by software and shall be adjusted as per the Clients requirements

**3.12.3 Door Anti-Nuisance Control / Forced Closing:**

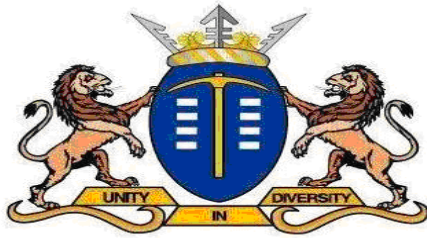
If doors are held open for an adjustable period of time by a passenger standing in the entrance or by constant pressure of the door open button, a buzzer shall sound and the doors shall start to close at a reduced speed and force level. When the doors touch an obstruction, they shall re-open. This adjustable **15 to 30-second software timer** shall be initially set at **20-seconds**.

**3.12.4 Door Protection Devices**

- **Leading Door Edge Protection:** Provide a electronic infra-red car leading edge protection device. The car door protection device shall extend at least **2100-mm** above the platform and its active surface/area shall project beyond the front edges of each leading car door panel. Should this device come in close proximity, or touch a person or object whilst the car doors are closing, the car and shaft doors shall return to their open position. Manual reversal of the doors while the lift is on automatic operation shall be accomplished by pressing a door open button in a car-operating panel.
- The door protection device shall have the capabilities of detecting metal objects / trolleys.
- The door protection device when mounted shall be recessed a minimum of 10mm from the leading edge of the door panel.

**3.13 LIFT SHAFT & PIT REQUIREMENTS**

- 3.13.1 Provide access ladders into pit and for pit buffers as required to service the equipment. The pit ladder shall extend from the pit floor to **1100-mm** beyond the level of the lower entrance.
- 3.13.2 Provide the necessary rope, or selector tape guards in pit areas.



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- 3.13.3 **Deep Pits:** Provide safe working platforms in pits with depths in excess of **Two (2) metres** and if necessary at the top of the shaft to create sheave room platforms. The working platforms shall comply with **the SANS 1545 (EN 81)** safety requirements pertaining to the depth/ height and free space of these areas. Access to the area below the pit working platform including lighting shall be provided to accommodate the checking of the lower section of car and counterweight guide, cleaning and checking of hoisting ropes if applicable for basement machines.
- 3.13.4 In terms of **SANS-1545 (EN 81)**, provide and install shaft lights in each lift shaft, the lower and highest light fitting shall be mounted no more than **500-mm** from the pit floor and shaft top respectively. These lights shall be switched from the lift motor room, top of shaft and pits and shall maintain a minimum lighting level of **50-Lux** measured at **1000-mm** above the car roof.
- 3.13.5 **Shaft Requirements:** shall apply if the existing equipment covered under this section is upgraded or if replaced:
- The positioning and fixing of all shaft steelwork shall be uniform and consistent throughout the shaft.
- 3.13.6 **Lower Shaft Dividing Screen:** Where the lift shaft contains several lifts and in terms of the **SANS-1545 (EN 81)**, provide ridged metal screens to separate the moving parts of the individual lifts. The metal screen shall be from the level of the first landing to a height of **2500-mm** and shall be the full width / depth of the shaft.
- 3.13.7 **Upper Shaft Dividing Screen:** Where the lift shaft contains several lifts and the running clearances of car and counterweight and car and counterweight of adjacent lifts in a common shaft do not meet the minimum requirements in terms of the **SANS-1545 (EN 81)**, provide ridged metal screens to separate the moving parts of the individual lifts.
- 3.13.8 **Pit Dividing Screen:** In terms of the **SANS-1545 (EN 81)**, provide ridged metal screens to separate the moving parts of the individual lifts situated in a common pits. The screens shall be the full depth of the shaft to the level of the first landing.

#### 3.14 CAR AND COUNTERWEIGHT GUIDE RAILS

Notwithstanding the requirements pertaining to performance, ride comfort, retained car and counterweight guide rails (shaft steelwork), guides for prestige office buildings, **SANS 1545 (EN 81)**, Best Engineering Practice and the Manufacturer's





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requirements, **Part-3.14.1** to **Part-3.14.8** shall apply if the existing equipment covered under these sections is modernised or if replaced.

- 3.14.1 Provide guide rails with brackets and sliding rail clips for each lift car and counterweight, suitably attached to the building structural members. Car guide rails and car frame shall be so located as to balance the car assembly in the guides.
- 3.14.2 **Guide fixings:** Provide any additional car and counterweight guide rail backing, intermediate steel and brackets fixed to the shaft wall with **two (2)** (minimum) bolts / Anchors per bracket as required between floors to maintain proper bracket spacing not exceeding **manufacturers specification**
- 3.14.3 **Guide Bracing:** Intermediate guide supports which use the guides of an adjacent lift and not the shaft wall or shaft trimmer as the supporting member, shall not be regarded as a guide fixing.
- 3.14.4 **Fish Plates:** Joints of car and counterweight rails shall be accurately machined with tongues and grooves in the ends of the rails at the centre of the railhead and base forming matched joints. Each rail joint gap, as installed, shall **not exceed 1.0-mm**. Each rail joint shall be fitted with machined fish-plates fastened to the back of each rail's machined surface with not less than a total of eight **(8) through-bolts**. Additional brackets with sliding rail clips between floor beams shall be provided as necessary to obtain proper rail rigidity and maintain the alignment for both the car and counterweight rails.
- 3.14.5 Shim packs shall be **20-mm** maximum and shall secure rail clip alignment and shall be so designed that they shall remain in position even though the fastening bolts may become loosened.
- 3.14.6 **Building Settlement:** Car and counterweight rails shall be cut off at the top and bottom with an allowance for building compression of **3.5-mm** per typical floor and a maximum of **300-mm** at Works Completion.
- 3.14.7 The final location of divider beams, with respect to each floor level, shall be co-ordinated under this section. Any additional steel members required for the installation of the lift equipment and not shown on the structural drawings, including their fabrication and installation shall be provided under this section. The reinforcement of structural steel to absorb rail forces and safety application applied at pinning floors, rather than in the pit, shall be provided under this section. Car and counterweight rail backing shall be provided as required by the code.
- 3.14.8 **Shaft Trimmer:** Shaft trimmers shall be (I) beams of adequate strength. Formed metal sections for example; (U) channels, (T) sections or Box Channels shall only be accepted on the submittal of the Manufacturer's design and fixing details.
- 3.14.9 The blade of car guides shall be machined.
- 3.14.10 The car and counterweight guide rails shall be provided and aligned so that the faces of the rails are plumb within plus or minus **5.0-mm** from top to bottom of the lift shaft. The maximum change in the distance between guides (DBG) shall not exceed **2.0-mm**.
- 3.14.11 **Retained Car and Counterweight Guide Rails:**





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- The car and counterweight guide rails shall be aligned if necessary to provide smooth and vibration free ride throughout the length of travel.

**3.15 HOIST AND GOVERNOR ROPES**

- 3.15.1 Hoist ropes of sizes and numbers sufficient to comply with the requirements of the relevant code and traction requirements. The shop drawings shall indicate the number and sizes of ropes proposed, together with the name of the manufacturer, type, ultimate strength, the proper working load and that the core is of manila fibre. All hoist ropes shall be cut in sequence from the rope reel and tagged for sequential adjacent installation.
- 3.15.2 The ends of the hoist ropes shall be properly secured to the car and counterweight cross-head or to the dead-end hitch plates on **2:1-roping**, with adjustable rope shackles having approved sockets. Screw adjustment shall permit equalisation of the tension in all ropes.
- 3.15.3 **Governor Ropes:** Governor ropes shall be in accordance with **SANS-1545 (EN 81)**. The two ends shall be securely fastened together at the lift and shall be attached to the safety operating mechanism. The governor rope shall pass over the governor sheave and over an approved tensioner sheave in the pit. An electrical contact shall be fitted to the pit sheave and shall stop the lift if the governor rope becomes slack or breaks.

**3.16 COUNTERWEIGHT**

- 3.16.1 Each lift shall be suitably counterbalanced for smooth and economical operation. Cast iron or steel sub-weights shall be contained in a guided structural steel frame. The counterweight shall be equal to the weight of complete lift car plus at least **40%** of the contract load. The weights in the counterweight frame shall be balanced with the weight equally distributed across the width of the frame to equalise guide pressures. The sub-weights shall be welded or fastened together as necessary to prevent rattling.
- 3.16.2 If the main ropes are to be replaced or renewed as part of the modernisation or in terms of the Maintenance Agreement, blocking between the counterweight and the buffer striker plate shall be provided equal to **300-mm per 30-meters** of hoist rope between car and counterweight.

**3.17 CAR AND COUNTERWEIGHT GUIDE ROLLERS OR SHOES**

- 3.17.1 **Guide Shoes: Part-3.17.1** shall apply if the existing equipment covered under this section does not comply with the requirements of this section or if modernised or if replaced:
- If the speed and load nominated allows and guide rollers are not required, provide car and counterweight spring loaded shoe guides. The spring tension



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shall be adjusted so as to maintain the lift in the centre of the rails and provide continuous contact with the corresponding rail surface under all conditions of loading and operation. The shoe guides shall be lined with a durable resilient material, which shall ensure a quiet and smooth ride.

- If the speed and load allows, spring tensioned guide shoes on the counterweight may be replaced with an alternative approved system.
- The car and counterweight guide rollers / shoes shall constantly provide the ride quality as specified.
- **Guide / Sliding Shoe Noise:** The guide and sliding shoe arrangement in conjunction with the guide rails selected for both the car and counterweight shall be designed and manufactured to limit all guide noise to a level not audible in the car enclosure or on the landings during travel.

### **3.18 COMPENSATION CABLES**

Provide compensation cables when required by manufacturers specification and in order to maintain traction on driving sheave throughout the length of travel.

### **3.19 BUFFERS**

New buffers shall be provided

- 3.19.1 Lifts operating at speeds of up to and including **1,0m/s** shall be provided with buffers of the energy accumulation type, at speeds of up to and including **1,6m/s** shall be provided with buffers of the energy accumulation with buffered return type, and at speeds exceeding **1,6m/s** shall be provided buffered of the energy dissipation type, placed at the bottom of the hatchway for both the car and the counterweight.

### **3.20 SAFETY GEAR AND GOVERNOR**

New safety gear and/or governor shall be provided.

- 3.20.1 Over speed governors and safety gear shall be arranged to stop the lift whenever excessive descending speed is attained. The safety gear shall be released by moving the lift in the up direction.
- 3.20.2 The governor rope system, including the governor and tension sheave, shall be arranged so that the carrier shall not release due to system dynamics when the lift is subjected to an emergency stop.



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- 3.20.3 Car and counterweight safety gear shall be provided with a switch to cut off power from the motor and apply the brake if the safety gear applies without tripping of the governor.
- 3.20.4 The governor shall be provided with an electrical contact, which shall cut off power from the motor and apply the brake if a speed of **110% nominal speed** is reached in either direction before tripping the governor.
- 3.20.5 Rope guards and an electrical contact to monitor the rope stretch shall be provided on governor rope tension sheaves.
- 3.20.6 If an accessible space exists below the car or counterweight, the counterweight shall be equipped with safety gear in terms of this section.
- 3.20.7 Safety gear supplied and installed shall comply with **SANS-1545 (EN 81)**.
- 3.20.8 **Ascending Over-Speed Brake / Safety Gear:** shall be provided for all new lifts.

As required in terms of **SANS-1545 (EN 81)** the lift speed in the upward direction shall be controlled by one of the following:

- Ascending safety gear fitted to the car,
- Governor and safety gear fitted to the counterweight,
- Main hoisting rope brake / clamp fitted to the machine bed-plate,
- Brake fitted to the main drive sheave.

#### 3.21 PIT SAFETY STOP SWITCHES

- 3.21.1 Each lift pit shall be provided with positive action pit safety switches easily accessible from the entrance to the pits without the necessity of entering. Pit switches shall comply with **SANS-1545 (EN 81)**.

#### 3.22 CAR PLATFORM AND SLING

Provide new platform and sling complying with **SANS 1545 (EN 81)**

##### 3.22.1 Static Balancing:

- The car platform with enclosure of each lift shall be balanced by arranging balancing weights to equalise the guide pressure front to back and side to side so that the pressure on any guide shoe roller does **not exceed 18-kg** without load in the car. (**Statically balanced**).
- It shall be accepted that the level of ride comfort is directly related to the static balancing of the car / sling. Therefore, as requested by the Lift Consulting Engineer, the Lift-Contractor shall demonstrate that the free hanging car / sling



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has as a minimum, been statically balanced in accordance with the requirements of this specification.

- As required the work related to meet the requirements of this section shall include but shall not be limited to:
  - Re-positioning and/or installation of balancing weights,
  - Repositioning of steady brackets,
  - Repositioning and/or adjustment of guide shoes / rollers and
  - Repositioning of the rope hitch.

### **3.23 TRAVELLING CABLES**

- 3.23.1 Provide travelling cables between the lift and the fixed lift shaft or motor room wiring. Travelling cables shall be flexible and suitably suspended to relieve the strains in the individual conductors and all cables shall contain an approximately equal number of conductors, or shall have equal flexibility.
- 3.23.2 As a minimum travelling cables shall contain two shielded pairs for each lift car to accommodate voice communication.
- 3.23.3 A minimum of 10% of trailing cable conductors shall be retained as spares for future use.

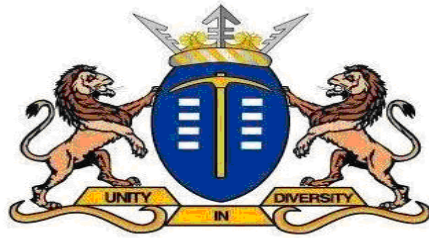
### **3.24 ELECTRICAL WIRING AND CONTROL COMMUNICATION NETWORKS**

- 3.24.1 Low voltage and control communication cables shall be run in separate ducts, conduits and trailing cables.

### **3.25 PASSENGER LIFT CAR ENCLOSURES**

Provide new stainless steel car enclosures

- 3.25.1 **Emergency Light Unit:** Provide emergency battery operated lighting and alarm units. The alarm switch shall be connected to the emergency battery source to ring the alarm bell in the lift shaft when the normal and the standby power source is not available. A button for the testing of the emergency-light battery power pack shall be mounted on top of the car. The emergency light unit shall form an integral part of the normal car lighting including fluorescent lighting and down lighter. Separate emergency light units mounted within the car enclosure shall not be accepted.
- 3.25.2 **Lift Enclosure Fan:** Provide silent running squirrel cage, centrifugal flow exhaust blowers mounted in the car roof to draw air into car enclosure from the landing when the doors are open and through car vents and door clearance gaps when doors



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are closed. The car ceiling or suspended ceiling shall be designed so as not to restrict the flow of air to the fan.

- 3.25.3 Provide car top terminal boxes of ample size incorporating clearly marked car wiring terminals and a car top inspection control unit.
- 3.25.4 Attend to all squeaks and noises produced by the sling and car enclosure prior to Works Completion.

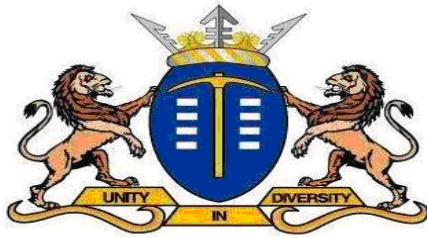
**3.26 LANDING ENTRANCES**

**NOTE: Part-3.26.1 to Part-3.26.4** shall apply if the equipment covered under these sections is upgraded or if replaced.

- 3.26.1 Provide shop drawings showing the wall and unit frame connection for the masonry or concrete wall system.
- 3.26.2 The type and construction of the unit landing frame shall be as specified under **Part-3** of this specification.
- 3.26.3 **Fire Rating of the Lift Entrances: (When Specified)** Provide **two-hour fire rated** landing entrance equipment, including door panels and signal faceplates. Should the landing faceplate fixtures not meet the two hour fire rating, provide additional fire rating fixed on the inside of the shaft. Provide the relevant **SANS** (South African National Standards) or equivalent International test certificates for a Class “C” type landing door equipment.
- 3.26.4 For maintenance purposes, floor designation shall be clearly and permanently and neatly marked with at least **100-mm** letters or numbers on the inside of the landing doors (shaft side).
- 3.26.5 Lift shaft landing entrance assembly shall consist of a unit frame, door panels, fascia, sill, hanger, closer and interlock in compliance with the applicable code requirements.
- 3.26.6 In compliance with **SANS-1545 (EN 81)**, provide landing door dis-locking devices on all landings.

**3.27 DOOR PANELS**

- 3.27.1 Provide door panels for all openings manufactured from **1.5-mm** minimum stainless steel. Provide continuous stiffener channels at top, bottom and edges. The bottom of each door panel shall be provided with removable laminated phenolic guides



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running in the sill slots and door guides shall be designed to be replaced without removing door panels. All door panels shall be reinforced and provided with keyways as required for door hangers and operating mechanisms. All mitres, junctions or other joints shall be securely welded, ground smooth and filled.

- 3.27.2 Door panels shall be constructed to operate free from objectionable squeaks or metallic sounds and shall be acoustically designed. Metal door panels shall be treated with a sound deadening material to produce a quiet door operation under all operating conditions.
- 3.27.3 **Door Panel Leading Edge:** Provide door panels with leading edge interlocking profiles and with rubber stoppers top and bottom to prevent the metal door panels touching when fully closed. Door leading edge rubber profiles shall meet the specified fire rating and shall not be accepted.
- 3.27.4 Car and landing door assembly shall be designed to maintain a minimum gap between door panels when fully open. It is intended that landing door add-on or in-fill site guards shall not be required.
- 3.27.5 **Stainless Steel Door Panels:** Where stainless steel door panels are specified, the entire door panel shall be constructed from stainless steel and shall not be a mild steel construction clad in stainless steel.
- 3.27.6 The selection of the door operator shall take into account the door height, clear opening and weight of the panels.

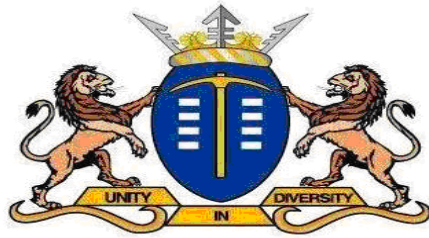
#### **3.28 SILLS AND SUPPORT ANGLES**

The landing sills for all openings shall be of narrow extruded aluminium or stainless steel. Grooves in sills for the door guides shall be machined with minimum clearances for the guides. The sills shall be supported on steel angles securely fastened to the building floor construction.

#### **3.29 STRUTS AND DOOR CLOSER SUPPORT ANGLES**

Steel strut angles of adequate size shall be provided to rigidly support the hanger housing and the door closers. The angles shall be continuous between the sill and building beams above and securely bolted to the header. Strut angles fastened to the guide rails or the lift shaft wall construction shall not be accepted.





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### **3.30 DOOR HANGER SUPPORTS**

Hanger supports shall be minimum **5.0-mm** thick steel-formed sections securely bolted to strut angles and closer support angles.

### **3.31 TOE GUARDS**

Provide toe guards constructed from mild steel on all landings. Toe guards shall extend the full width of the door opening and shall be gradually bevelled and fixed to the wall. The straight vertical portion of the guards shall equal a distance of **400-mm** or as in the case of the lowest landing shall equal the distance travelled by the car sill from when the car is on the fully compressed buffer. Toe guards for observation lifts shall be the full width of the door sill and shall be manufactured from the material as specified for observation lifts.

### **3.32 FASCIA PLATES**

3.32.1 Where the car sill to shaft front clear distance exceeds the maximum allowed in terms of **SANS-1545 (EN 81)**, provides fascia plates constructed from mild steel and reinforced where necessary to ensure a ridged surface. Fascia plates shall extend the full distance between header and sill and shall extend the full width of travel of the doors.

3.32.2 Alternatively, if car door mechanical locks are provided, fascia plates are not required. Car door locking mechanism using an electrical solenoid shall not be accepted.

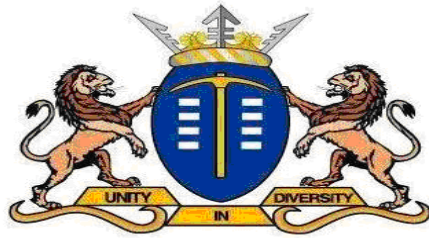
### **3.33 FIXTURE FACE-PLATES AND MOUNTING**

3.33.1 For all lifts with square rectangle stainless steel face-plates and unless otherwise specified, landing fixture faceplates shall be surface mounted and shall be of stainless steel. However, alternative landing fixture faceplates may be offered if these faceplate are generic products and aesthetically acceptable to the Principal Agent and Consulting Lift Engineer.

3.33.2 The fixture faceplates in the lift car shall be mounted with concealed security fastenings or fastenings requiring special tools to remove them. Exposed fastenings shall match the material and finish of the faceplate.

3.33.5 Without exception the Principal Agent and Consulting Lift Engineer shall sign off and approve the final design of the fixture faceplates before placing the order or manufacture of this equipment.

**3.34 Blanking-off Faceplates:** Where applicable, allowances for full blanking-off plates to cover the existing landing indicator and/or arrow and/or button unit cut-outs shall be included and shall be of stainless steel.



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### **3.35 CAR POSITION INDICATOR**

- 3.35.1 Provide electronic or liquid crystal digital readout position indicators incorporated in each lift car operating panel.
- 3.35.2 Information to be displayed shall include but shall not be limited to, floor position, fire control information / status, independent service (goods mode) and over-load conditions.
- 3.35.3 The digital readout shall be at least **50-mm** in height.

### **3.36 CAR OPERATING PANEL (COP)**

- 3.36.1 Provide **full height car operating** panel(s) incorporating but not limited to:
- A series of call buttons, numbered to correspond to the active landings.
  - Emergency alarm button.
  - Fan switch if not automatically controlled.
  - Intercom equipment.
  - Voice Annunciation components as specified.
  - Door open and door close buttons.
  - Position indicator as specified.
  - Signage as specified.
  - Independent / reservation control equipment specified.
- 3.36.2 Car operating panels shall be laser cut and flush mounted into the car fronts or car side panels.
- 3.36.3 Provide car call and emergency buttons with an approved, micro-push operation. Each button shall be clearly marked with its corresponding floor position or function as the case may be. The demarcation shall either comprise a raised or recessed numeric or alphabetic character. Call buttons offered shall be those as regarded as top of the range equipment by the Lift-Contractor and shall be approved in terms of Health and Safety.

#### **3.36.4 Disabled Requirement.**

Except for dedicated goods lifts and in accordance with **SANS 50081-70: 2004 (EN 81-70:2003)** the following shall apply:

- **Tactile / Braille Buttons:** Provide Tactile or Braille car call buttons. Braille buttons shall be provided with the Braille incorporated (engraved) into the button unit.
- The car operating panels shall be **Disabled friendly** and shall be located so that all operating and emergency buttons are located within **1200-mm and 900-mm** above the car platform. The emergency buttons and switches including the alarms, door-open button, intercom button and control key switches shall be



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mounted at the bottom and the call buttons shall be mounted in numerical order starting above the emergency button and numbering from left to right.

- The minimum area of the active part of the button shall be **49-mm** square or an inscribed circle of **20-mm** square diameter.
- The position of the symbol shall be on the active part or **10-mm** to **15-mm** left of it.
- The minimum distance between active parts of the buttons shall be **10-mm**.

#### 3.36.5 Voice Annunciation:

Provide blind friendly full range volume controlled voice annunciation / voice synthesiser. The voice annunciation shall be software generated. Voice annunciation shall be in English and shall have a clearly understandable English accent.

Voice annunciation shall include:

- Next selected landing at which the lift will stop,
- The direction the lift is committed to travel,
- Special door safety instructions,
- Special instructions if the lift is held up at a landing for an extended period of time.
- Announcement when the lift is overloaded.

3.36.6 Car operating panels shall be arranged so that the call buttons and the control and signal devices are substantially flush to the vertical surface. The wiring to the individual components shall permit the panel to swing open for maintenance purposes without disconnecting any of the fixed wiring.

3.36.7 **Signage:** Provide all mandatory notices including, load plate, official lift number and emergency instructions. Signage shall be engraved into the car operating panel or alternatively, signage on removable plates laser cut and flush mounted into the car operating panel may be accepted.

3.36.8 **Key Switches:** All key switches in the fixture faceplates of landing stations, car stations and supervisory control stations shall be master-keyed with removable core cylinders (KABA type or equivalent). Key switches shall be clearly designated and the on/off position shall be clearly marked.

3.36.9 **Goods and Trolley Passenger Lift COP:** To allow for maximum and optimum loading, bed, goods and trolley passenger lift's COPs shall be mounted in the car fronts or if no car fronts exist, as close as possible to the lift entrance.

#### 3.37 CALL BUTTON ACKNOWLEDGING LIGHTS

Car and landing call buttons shall be of the electronic illumination acknowledging type. The registering of a call button shall illuminate the button to acknowledge that a call has been registered. Only LED type illumination for call buttons shall be accepted.



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### **3.38 LANDING CONTROL STATIONS**

#### **3.38.1 Landing Call Buttons (Conventional Lift Controls):**

- Provide landing button stations on all floors. Terminal floors shall contain a single button station and intermediate floors shall contain both up and down buttons. The number of landing risers shall be as specified under **Section-5** and registration of the button in one fixture shall cause the illumination of the corresponding button unit in the other fixture at the same landing.

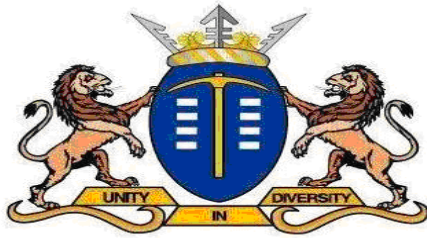
Provide landing buttons with an approved, micro-push button operation. All landing fixtures shall be high quality vandal resistant type and shall be presented to the customer and the customers consultant for approval prior to ordering from the manufacturer. Only LED type illumination for call buttons shall be accepted.

### **3.39 WAITING PASSENGER LANTERNS AND GONGS**

#### **3.39.1 Waiting Passenger Lanterns and Gongs (Conventional Lift Controls)**

- Provide an up and down, electronic or liquid crystal digital readout electric indication waiting passenger lantern at each intermediate landing and an up or down single indication lantern at a terminal landing of all lifts. The lanterns shall be mounted above the head jamb or beside the side jamb or shall be incorporated into the landing frame on each typical entrance. Incandescent illumination indicator lamps shall not be accepted.
- Supply and fit full range volume controlled / adjustable electronic arrival gongs to each entrance. The fixture faceplate shall contain an approved pattern of perforations / slots to enable the transmitting of the sound from within the shaft to the lift foyer. Gongs shall be fitted in enclosures to retain and direct the annunciation to the applicable landing foyer. It is intended that arrival gongs on one landing will not be heard on another landing.
- As soon as a lift has reached a predetermined distance from a landing and is going to stop at that landing, the corresponding waiting passenger lantern shall be illuminated and the gong shall sound whether or not a landing call has been registered. The waiting passenger lantern shall remain illuminated until the lift leaves the landing or if the car becomes filled whichever occurs first.
- **Disabled Friendly Gongs:** In order to meet the disabled friendly requirements, the tone of the gong for up and down shall differ i.e. one “gong” for up and two “gongs” down.

### **3.40 LANDING POSITION INDICATOR**



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3.40.1 Provide electronic LED or liquid crystal digital readout position indicators over the architrave of each lift or incorporated with the calling button unit. As the lift travels through the lift shaft, its position shall be indicated continuously by the illumination of the numeral or letter corresponding to the landing at which the lift is stopped or passing.

3.40.2 Landing position indicators **shall not illuminate** with the floor position if the lift is not able to respond to landing calls as a result of a fault condition, on inspection control or when undergoing routine maintenance.

**3.41 LANDING DOORS AND ARCHITRAVE FINISH**

3.41.1 **Stainless Steel Landing Finish:** The direction of the grain of stainless steel door panels, frames and headers shall be in the same direction. Unless otherwise specified by the Principal Agent or Consulting Lift Engineer, the direction of the grain for a stainless steel finish shall be vertical / top to bottom.

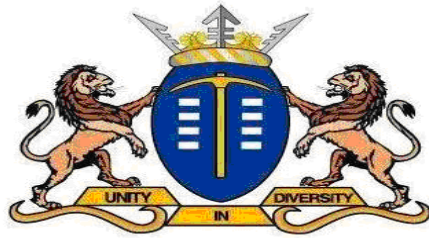
**3.42 LIFT CAR FINISHES**

3.42.1 Decorative finishes in the car or floor covering shall not have a fire index of more than **two (2)** when tested in accordance with **SANS-0177: Part3 or 4**, as the case may be.

**3.42.2 Enclosure Finish Safety Gear Test:**

- The design and final fixing of the car interior wall and ceiling covering shall be tested by activating the safety gear while the lift is running in a down direction at nominal / contract speed.
- On completion of the safeties test, the lift enclosure wall and ceiling panels shall be inspected for distortion or damage and if necessary, the test covered under this section shall be repeated until satisfactory conclusion.
- In order to verify the design and inspect the hidden fixings of the car enclosure wall and ceiling panels, the Principal Agent or Consulting Lift Engineer reserves the right to request the removal of the wall and ceiling covering after the safety gear test covered under this section.

3.42.3 **Stainless Steel Car Entrance Finish:** The direction of the grain of stainless steel door panels, slam-posts and headers shall be in the same direction. Unless otherwise specified by the Principal Agent or Consulting Lift Engineer, the direction of the grain for a stainless steel finish shall be vertical / top to bottom.



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3.42.4 **Finish:** Work relating to the finish requiring written approval prior to placing the order or manufacture from the Principal Agent and/or Consulting Lift Engineer shall be understood as and shall include:

- Entire lift enclosure - design and finish.
- Car and landing fixture faceplates -design, finish and location.
- Buttons and signals – design and finish
- Signage – design, finish and location.
- Car and landing entrances – design and finish.

3.42.5 **Blanking off Plates:** Where applicable, provide full blanking-off faceplates to cover the existing car operating panels and indicator cut-outs. Blanking off plates to cover cut-outs of removed indicators above the entrance shall extend the full width of the car entrance header section.

#### 3.43 PROTECTION PADDING / DRAPES

Provide vinyl impregnated nylon faced drapes for goods / passenger lift car enclosures. The vinyl-impregnated nylon shall be at least **1.5-mm** thick backed by **7.0-mm** padding. Pads shall be double stitched on a grid **150-mm** on centres. Padding shall be treated with a fire retardant compound so as to be self-extinguishing. The protection padding shall be provided to protect the two sides and the rear of the car enclosure. Suitable supporting studs shall be provided in the car enclosure in accordance with the Principal Agent and Consulting Lift Engineer's requirements. Quantities shall be specified under **Section-6**.

#### 3.44 LIFT INTERCOM SYSTEM

3.44.1 Provide a 5 way intercom system complete with talk-back speakers with all required auxiliary equipment, wiring, a **Six (6) hour** minimum back up power supply/

3.44.2 Lift travelling cables on each lift shall contain **Two (2)-shielded** twisted pairs of conductors for intercom usage.

3.44.3 Provide one hands-free sub-station in each lift car, one master-station for each motor room and one master-station for the security / control room as specified. Two-way voice communication between the lift car and lift motor room, lift car and control room, and lift motor room and control room shall be possible.

**Intercom Security / Control Room:** The lift intercoms for all the lifts and motor rooms shall be wired back to a centrally located common security / control room.

**GSM Auto-Dialler:** in addition to the specified intercom system, all lifts are to be equipped with a GSM Auto-Dialler system. The GSM unit is to be located on top of the car or in the lift motor-room. The installation shall ensure that the signal strength





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to the GSM unit is at all times sufficient to ensure radio communication no matter what the position of the lift car in the shaft. The required audio quality shall be the same as that specified for the intercom unit.

The GSM unit shall be programmable and shall have the facility to dial alternate numbers should the first programmed number be unavailable. The unit shall be activated after the alarm button is pushed for a period longer than 3 seconds

#### 3.44.4 Breakdown Rate:

- Provide guarantees that after completion of the lift installation, the lift breakdowns / equipment interruptions shall not exceed the stop rate shown below. The fault analysis shall be compiled on a monthly basis and assessed on a “rolling year”. A defect as stated above is defined as an event, which prevents equipment from providing its required service and which was not as a consequence of an external factor or at the specific direction of the Employer.
- The total annual average stops per lift shall not exceed **Four (4)**. The total annual stops per lift which are attributed to the lift drive and control systems, shall not exceed **Two (2)**.
- If the lifts do not deliver the specified service after Works Completion and the twelve (12) months guarantee period, it shall be considered as a Latent Defect to be rectified by re-commissioning, adjusting, or replacing equipment at no additional cost to the Employer.

#### 3.45 MACHINE AND CONTROL DATA SUBMITTALS

3.45.1 **Machine Data:** Provide the relevant machine data as shown below to ensure the correct Power Feeder Design well in advance of field requirements:

- Lift numbers:
- Capacity / load: kg
- Speed: m/s
- Supply Voltage: Volts
- Supply Frequency: Hertz
- Number of wires:
- Motor kW rating: kW
- Roping:
- Full load UP acceleration: Amps
- Full load UP nominal speed: Amps
- Machine heat release per car: BTU/hr/car
- Power Factor: %



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**SPECIFICATIONS OF LIFTS**

**Villa Heidi Residence Lift:**

**GENERAL**

<b>Explanation</b>	
Total Travel	To be measured
Pit Depth	To be measured
Shaft Width	To be measured
Shaft Depth	To be measured
Overhead	To be measured
Car Depth	1600 mm
Car Width	1400 mm
Car Height	2200 mm
Capacity	1000kg / 13 passengers
Door opening Type	Centre opening
Door opening dimensions	900 mm x 2100mm
Number of stops:	5
No. of Floors:	G – 4
Description of lifts	Passenger
Lift numbers	L1
Quantity of units:	1
Number of landing entrances	5 per lift
No. of car entrance:	1 per lift
Counterweight safeties	N/A
Painting	Motor room, pit and shaft steelwork
Load weighing device	Strain gauge type
Bumper rail	Yes
Brush stainless steel finish on car panels	Yes

**MACHINE**

<b>Explanation</b>	<b>Specific Requirements</b>
Machine:	Permanent Magnet Gearless
Drive system	AC – VVVF
Rated Speed	1.0 m/s
Load	1000 kg
Ascending over speed protection	Provide As indicated in the document



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#### CONTROLLER

Group Control	Supply as indicated in document
Independent Service	Supply as indicated in document
Emergency Power operation	Supply as indicated in document
Drive control	Supply as indicated in document
Up and down peaks	N/A
Fireman's Service	Supply as indicated in document
Automatic Relevelling	Supply as indicated in document

Supply variable voltage variable frequency drive with controllers compatible for the usage in hospitals and compliant with EMC requirements for equipment installed in hospitals (**PLC's will not be considered**)

**Preference shall be given to tenderers who offer traditional type lift equipment, which utilizes the existing motor-room and infrastructure. All lifts offered are to be of equal or greater load carrying and floor area capacity than the original lifts.**

**The dimensions of the lifts which have been provided are for tender information purposes, the Client or the Client's agent shall not be held responsible for any deviations or costs which can arise should it be found that the information is inaccurate in any way. The tenderers are to go to site and verify all information and dimensions prior to submission of their tender documents.**

**NOTES: PRICING SUBMITTED SHALL BE FOR A TOTAL REPLACEMENT OF THE EXISTING LIFTS WITH NEW EQUIPMENT AS SPECIFIED. THE CONTRACTOR IS TO INCLUDE ALL COSTS ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF THE NEW LIFTS. ALL OBSOLETE AND REMOVED EQUIPMENT REMAINS THE PROPERTY OF THE GAUTENG PROVINCIAL GOVERNMENT, THE CONTRACTOR HAS NO SALVAGE RIGHTS OVER THIS EQUIPMENT.**