

1.37.5 Security: Abide-by and adhere to the strict building security measures. Security measures implemented and accepted shall pertain to all staff involved on this project.

1.37.6 Barricading / off Landings / Foyers:

- Provide barricades and safety notices for the area / foyer where upgrade work is in progress. Signage to warn persons of unsafe conditions related to work in progress on lift foyers shall not be regarded as sufficient without physically barricading off the working area.
- Barricading / Hoarding shall be rigidly secured and supported **WHITE 16-mm** plywood. The colour shall be verified and approved by the Employer before placing the order for the material to construct the barricading.
- The height of the hoarding shall be as follows:
 - **2100-mm** where no structural and/or wet works is required and
 - **3000-mm** where structural and/or wet works is required on the landings.
- The quantities shall be as determined and as deemed necessary by the Lift-Contractor to meet the safety requirements of the Works Information.

1.38 STATEMENT OF INSTALLATION

Submit at tender stage, informative technical information and drawings relevant to the type, design, method of installation, Builder's Work (electrical, structural and mechanical) and the method of installing the position of the landing buttons and signals.

1.39 SANS-1545 SAFETY REQUIREMENTS

At Works Completion, all lift equipment shall comply with all the relevant and published South African National Standards including but not limited to the **SANS-1545Part-1 or Part-2** as the case may be.

1.40 BUILDER'S WORK

- 1.40.1 Provide all Builder's' Work, structural, mechanical and electrical work which is necessary for the proper and complete installation of the equipment. Builder's Work to be considered shall include but shall not be limited to:
- 1.40.2 Visit the site to clearly determine the anticipated scope of the Builder's Work and provide such detail in the tender submittal under the heading "Builder's Work

1.40.3 Contingency Sum – Builder’s Work

1.40.3.1 In terms of the Works Information and at the discretion of the Consulting Lift Engineer and Principal Agent, a contingency sum shall be provided to cover unforeseen.

1.40.3.2 Claims against the contingency sum shall be clearly motivated and a detailed quotation(s) presented for approval by the Consulting Lift Engineer and Principal Agent prior to commencing with the associated work.

1.40.4 Make good any damage to the walls and floor that has resulted from the on-site work.

1.40.5 **Removal of Equipment:** Make provision to remove the existing lift equipment as required.

1.40.6 **Motor-Room-Less Lift’s Control Panel:** Consider the position of the MRL lift control panel on the landing and determine the extent of the structural and electrical work associated with the installation of this item.

1.41 RADIO FREQUENCY INTERFERENCE

Provide only equipment sufficiently suppressed so as not to interfere with building communication and/or building management systems. Equipment provided shall not be susceptible to EMI.

1.42 TESTING, CONFIDENCE TRIALS AND WORKS COMPLETION

1.42.1 **Works Completion Inspection:** The Lift-Contractor having satisfied itself that the works are complete in every respect and ready for testing, shall notify the Consulting Lift Engineer with reasonable notice in writing of the date after which the Works Completion Inspection and tests can take place. Unless otherwise agreed the Works Completion Inspection shall take place within **10-days** of such notice.

1.42.2 **Availability:** The availability of the unit(s) for testing and hand-over shall be as measured against the Works Information with regards to the stage(s) or phase(s) of completion.

1.42.4 **Works Completion:** Works Completion shall be regarded as having been attained on full compliance with the Works Information, on the satisfactory conclusion of the

Confidence Trial(s) and on issue of the Works Completion Certificate by the Consulting Lift Engineer or Principal Agent.

1.42.5 **Repeat Works Completion Inspections and Tests:** At the Works Completion Inspection, if any portion of the work is not ready for inspection or testing or fails to pass the tests, the Works Completion inspection shall be repeated within a reasonable time under the same terms and conditions save that all reasonable expenses incurred by the Employer which has resulted from repeat inspection and tests shall be deducted from the Contract Sum.

1.42.6 **Failure to pass Repeat Works Completion Inspections or Confidence Trials:** If the work or any section thereof shall fail to pass the tests on a repetition thereof, the Consulting Lift Engineer shall be entitled to:

- Order further repeat inspections and tests under the conditions of **Part-1.42.5&Part 1.42.6** or
- Reject the works as a Defect if the results of the inspection or tests shows that the work or any section thereof fails to meet the performance, operation and reliability as specified or
- Issue a Works Completion Certificate if the Employer so wishes, subject to such reduction of the Contract Sum as may be provided in the Works Information or failing such provision, as may be agreed by the Employer and Sub-Contractor or failing agreement, as may be determined by mediation/ arbitration.

Tenderer's Official's name (Print):	
Signature of Official	
Date:	

PART 2: OPERATION

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 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 a 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 or load-cell 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 reset automatically.

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 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.
- 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).
- 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 tip 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 tip 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.

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. The steel beams shall be provided by the lift supplier and shall be suitably rated for normal duty as well as for any maximum load which may be placed on the machinery during full load safety applications etc.
- 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 SANS 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. Each brake shall be fitted with monitoring switches which shall be

monitored by the main control CPU and the lift shall be immediately shutdown in the event of a malfunction of these switches.

- **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 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 control systems which have been designed and manufactured for passenger carrying lifts. **PLC type controllers will not be accepted.**
- 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 Variable Voltage Variable Frequency 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.
- 3.5.5 The hoist motor shall be provided with a thermostatically controlled blower if necessary, to dissipate accumulated heat so as to maintain the equipment below 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 to meet 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 an 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 **fifty (50)** 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 over-travel and rope stretch. The lift shall be maintained 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 diverter 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 will be accepted.
- 3.10.2 **Duty Cycle:**
- **Passenger Lifts:** Only door operators with heavy-duty guide rails / tracks shall be accepted for Passenger Lifts.
- 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 Employer.
- 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.

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 to meet the traffic requirements of the application.

- 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.

3.12.4 Door Protection Devices

- **Leading Door Edge Protection:** Provide an 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.

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.
- 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 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:

- The car and counterweight guide rails shall be aligned if necessary to provide smooth and vibration and jerk 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 this project 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 specified allows and guide rollers are not required, provide car and counterweight spring loaded shoe guides. The spring tension 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 manufacturer's 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.
- 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 installation where there is a required upgrade or replacement of the main driving machine.

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**

Should a new lift car be required, provide new platform and sling complying to **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 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.

3.24 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

Should new car enclosures be required, the entire enclosure is to be manufactured from stainless steel.

- 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 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.

3.26 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 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 key-ways 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.

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.

3.30 DOOR HANGER SUPPORTS

Hanger supports shall be **5.0-mm** minimum 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)**, provide 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.

3.35 CAR POSITION INDICATOR

- 3.35.1 Provide LED or LCD 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 maintenance operation etc..
- 3.35.3 The digital readout shall be at least **50-mm** in height.

3.36 CAR OPERATING PANEL (COP)

3.36.1 Provide car operating panel(s) incorporating but not limited to:

- A series of call buttons, numbered to correspond to the active landings. Not applicable if destination control has been specified.
- 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 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:

- **Braille Buttons:** Provide 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 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. Incandescent lamp illumination shall not be accepted.

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. In the case of multiple risers, activation of a button on one riser shall ensure the activation of same button on all risers on the same floor.
- Provide landing buttons with an approved, micro-push button operation. All landing fixtures shall be high quality vandal resistant type.

3.39 WAITING PASSENGER LANTERNS AND GONGS

3.39.1 Waiting Passenger Lanterns and Gongs (Conventional Lift Controls)

- Provide an up and down, LED or LCD 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 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

- 3.40.1 Provide LED or LCD digital readout position indicators over the architrave of each lift. 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.

- 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 all 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 an 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 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 CCTV Camera Requirements:

Provide CAT6 Shielded twisted cable for each lift car for the connection of digital CCTV cameras, which will be provided by the Client.

3.44.5 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: %

3.46 MOTOR-ROOM-LESS (MRL) LIFTS INSTALLATIONS

Shall apply if motor-room-less lift equipment is provided.

3.46.1 Codes of Practice: The standards and requirements for the installation of motor-room-less lifts will therefore, have to satisfy **SANS-1545** (latest edition) as well as all other codes, practices, standards and local by-laws applicable to this type of lift installation.

3.46.2 Noise and Vibration Levels: The noise generated by the control and drive 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.

3.46.3 Motor-room-less lifts shall be supplied as a complete package and the following items shall be provided and considered as an integral part of the equipment:

- Distribution board including circuit breakers and earth leakage for control equipment,
- Motor room lights (**minimum 200-lux**),
- Car lights and plugs,
- Pit lights (**minimum 50-lux**),
- Shaft lights (**minimum 50-lux**),
- Motor room plug socket (15-Ammps),
- Pit plug socket (15-Amps).

3.46.4 All electrical work shall comply with the requirements of **SANS-0142**.

3.46.5 Painting of the Motor Room: Paint the motor room walls and roof within the shaft white. The motor room shall be considered as the complete shaft area containing the drive and control equipment from the level of the highest landing to the top of the shaft / motor room roof.

3.46.6 Electrical Feeder / Supply Cable & Distribution Board:

- Provide all material and work required to extend or transfer the lift supply cable(s) from the existing DB Board to the new distribution board mounted in the shaft (motor-room less lifts).
- Provide all material, work and signage necessary to make the existing distribution board safe after relocating of the lift's electrical supply and distribution board into the lift shaft.

3.46.7 Car-Top Guard Rails: In terms of **SANS-1545 (EN 81)**, the car roof shall be provided with a balustrade (guard-rail) where the free distance in the horizontal plane beyond and perpendicular to its outer edge exceeds **300-mm**. The balustrade shall fulfil the following requirements:

- It shall consist of a toe guard of **100-mm** height and an intermediate bar at half the height of the balustrade,
- Considering the free distance in a horizontal plane beyond the outer edge of the hand-rail of the balustrade, its height shall be at least:

- **700-mm** where the free distance is up to **850-mm** and
- **1100-mm** where the free distance exceeds **850-mm**.

3.46.8 Inspect and verify that the existing power feeder system is compatible with the equipment offered and any changes or upgrading of the electrical supply shall be brought to the attention of the Consulting Lift Engineer and Principal Agent at tender stage. Any work to the power feeder system necessary to produce a reliable lift operation and which was not brought to the Consulting Lift Engineer and Principal Agent's attention, shall be undertaken by the Manufacturer at no additional cost to the Employer.

3.46.9 All components and their respective adjustment which do not form part of the equipment change yet influence the optimum operation of the upgraded equipment, shall be included in the Manufacturer's scope of works.

PART 4

SPECIFIC REQUIREMENTS FOR LIFTS

The following items are special requirements for the upgrade project at Universitas and National Hospital; it is a requirement of the tender that these requirements be met. Should it not be possible for the Tenderer to meet these requirements, they are to indicate any deviation or qualifications in writing and this information is to be submitted in the form of a covering letter together with the tender document.

LIFTS

4.1 Guide-Rails

With the intention of minimizing disruption to daily operations of the building and in keeping the project lead-time to a minimum, the Tenderer is allowed the option to retain and re-use the existing guide rails. Should the guide rails be retained, it is the responsibility of Contractor to ensure that the rails are re-aligned to ensure that the ride quality as detailed in this specification is achieved.

4.2 Contract Speed

For all units, existing lift contract speeds should be maintained; tenderers who propose any contract speed lower than the existing will not be considered for this project.

4.3 Goods Passenger Lift Cars

All goods/passenger lift cars provided shall be of the same size as the existing with, Tenderers are to ensure that they familiarise themselves with the existing design and they offer the same or better. Standard/reduced car sizes will not be accepted as replacements for the existing goods/passenger lift cars.

4.4 Retained Equipment

With the intention of minimizing disruption to daily operations of the building and in keeping the project lead-time to a minimum, the Tenderer is allowed the option to retain and re-use the following equipment:

4.4.1 Guide Rails: As detailed in point 4.1 above

4.4.2 Counterweights: the existing counterweights can be retained and re-used, however it is a requirement that all guide-rollers and their stands be replaced with suitable high performance equipment. Should a 2:1 roped lift counterweight be retained, the successful contractor is to ensure that the counterweight diverter sheaves are removed, all bearings are to be replaced, the sheave is to be inspected by X-Ray and a certificate is to be issued to the Client (prior to the unit being returned to service) indicating that the diverter sheave is

free from any structural or mechanical defects and that the diverter sheave is safe for re-use.

- 4.4.3 Pit equipment: any pit equipment including but not limited to; diverter sheaves, rope tension sheaves, car and counterweight buffers are to be fully re-conditioned and certified as per the requirements for counterweight sheaves and bearings.

MAINTENANCE

- A. Maintenance Program: Within 60 days after the Notice To Proceed, and prior to installation, Contractor shall submit a detailed Maintenance Program, showing functions to be performed and their schedule. The Maintenance Program shall also include trouble call service and emergency repair service.
- B. Free Maintenance Period: Contractor shall perform maintenance on the lifts as specified in the tender document, after Completion and the unit is open for public use. Contractor will not be relieved of maintenance until final acceptance of the lift is issued. Maintenance shall include all work and materials needed to keep the equipment in perfect operating condition. Contractor shall coordinate and perform maintenance in a manner to result in minimum inconvenience to the users/building occupants.
- D. Work Hours for Maintenance:
1. Routine maintenance, non-urgent repairs, and warranty work shall be performed on no more than one lift at a time per duplex.
 2. Repairs (urgent repairs) required to return equipment to service shall be accomplished as soon as possible.
 3. The Contractor shall notify the Consultant/Engineer 48 hours in advance to request access to the equipment for routine or non-urgent work.
- E. Inspection during Maintenance Period: Systematic inspection once a month; adjustment and lubrication of lift equipment when required as recommended by the manufacturer. Replace defective parts with new parts of same manufacture as required.
- F. Follow-Up Tests: Test all safety devices as per SANS50081/manufacturers requirements.
- G. Performance Standards:
1. Maintain the performance standard specified herein and maintain correct operation of all safety devices and circuits.
 2. Maintain uniform starting, stopping and uniform riding qualities at all times.
- I. Final Service and Inspection: Two weeks before expiration of the Maintenance Period, the equipment shall be lubricated, fully serviced, adjusted to the standards designated herein and safety devices shall be checked; A complete inspection will be made by the

Consultant/Engineer or Client representative.

- J. Keep a Record book on each lift with the following information: Worker's name, date, time arrived, total time spent, parts inspected, adjustments and work done, and parts replaced. The records shall be submitted to the consultant/Engineer at one-month intervals.
- K. Contractor shall maintain local stock of parts for maintenance throughout the Warranty Period and the Maintenance Period.
- L. Chargeable Repairs: Contractor will not be responsible for trouble calls that are due to misuse, or accidents, or are otherwise not caused by the Contractor. Calls, which result in adjustment of safety devices not accessible to the public, will not be reimbursed. Contractor shall submit all documentation necessary to prove that a particular trouble call should be a Chargeable Repair. Contractor shall also submit all documentation necessary to justify the direct costs incurred.

RELIABILITY

A. Definitions:

- 1. Run-in Period: The initial period of operation of the lift. There shall be only one Run-in period for the lift, regardless of maintenance, unless a modification or other major work done has been performed on the lift, during, or after the run-in period.
- 2. Failure: An incident which is corrected by replacing a part, resetting the unit, or making an adjustment. Exceptions to failure are conditions of misuse, vandalism, accidents or negligence not caused by the Contractor.
- 3. Incident: An incident is any lift stoppage, regardless of cause.
- 4. Pattern Failures: The occurrence of multiple independent failures of the same primary replaceable item or adjustment in identical or equivalent applications.
- 5. Reliability Demonstration Test (RDT): A test to determine a reliability-associated parameter, such as available operating time, within defined statistical risks or with a specific statistical confidence.

B. Requirements:

- 1. The break-in period shall begin after the installer has satisfactorily completed the lift installation, obtained respective annexure certificates and the Consultant/Engineer has performed substantial inspection of the lift. The lift shall be barricaded and operated continuously under no load condition for a minimum of

48 hours. Upon satisfactory operation without incident, the barricades may be removed and the lift may be put into service to the public.

2. After the run-in period, the Reliability Demonstration Test (RDT) shall begin. The lift shall operate up to full load under normal modes of operation in either direction and be able to provide 95 percent reliability as determined by the following formula: % Reliability = T/A

T = Actual aggregate operation time for the lift. Downtime for scheduled preventive maintenance and incidents, which are not failures, shall not be deducted from the aggregate operation time. A = Aggregate revenue operating time of building, nominally 14 hours per day.

3. Contractor shall take corrective action to eliminate pattern failures, regardless of total operating time accumulated. The Contractor shall notify the Clients office that a unit has been returned to service after corrective actions or maintenance has been performed. The tracking of down time is determined by reports from the Clients facilities management offices. Failure by the Contractor to report "returned to service" will result in lower reliability performance and will remain the responsibility of the Contractor.

C. The Contractor shall:

1. Collect the data and document the results of the RDT, perform all calculations, and issue the results.
2. Review all failure incident reports to ensure that only pertinent failures are included in the test results.
3. Review the data with Consultant at interim stages of the RDT and at the final stage, prior to issuing the results.

- D. If the Consultant determines that the RDT has failed below the 95 percent goal for any consecutive 30 day period, the Maintenance fee due to the Contractor for the that 30 day period shall be reduced by the following formula: $A = MF * \% \text{ Reliability}$; where A = Amount due to Contractor,
MF = Monthly Maintenance Fee for one lift, %Reliability = As calculated above.

GENERAL

- **Builders Work:**

Tenderers are to submit a list of builders work which is required as part of the installation of lifts and escalators together with the tender document.

- **Scaffolding:**

All scaffolding, hoarding, boarding and barricading required during removal of existing equipment or installation of new equipment is to be included in the tender amount and erection and dismantling thereof shall be the responsibility of the successful bidder.

- **Hoarding & Barricading of Works:**

It should be noted that the Hospital is a fully occupied and operational building, all works taking place in areas exposed to building occupants and the general public are to be enclosed by suitable, aesthetically acceptable temporary structures which will ensure that building occupants, the general public and patients are not exposed to any danger. Prior to the commencement of any construction or installation of hoarding and barricading, a drawing indicating the structure and type of materials intended for use is to be submitted to the consultant for approval.

- **Structural Changes:**

Tenderers are to submit a list of any changes, which will be required to the lift supporting structure to facilitate the removal or installation of the new equipment. The list of required changes is to be submitted together with the tender document. Should any structural changes be required for the removal or installation of lifts forming part of this tender, details of the changes are to be submitted to the Client or the Client's appointed representative in writing prior to the commencement of any related work.

- **Lift Management System:**

As part of the Tender, the cost for an integrated lift management system is to be included in the tender amount. The management system shall be a 'real time' system, which displays lift group activity, car positions, and lift and escalator status. The management system shall also allow remote control of lifts and escalators (shut-down, fire operation etc.) A full description of the offered management system is to be submitted together with the tender document.

- **Setup and Test Equipment:**

After completion and final handover of the project, the Contractor is to provide as part of the handover package, to the Client or the Client's appointed representative the following: A list of setup and adjustment parameters, passwords, test tools required for setup and adjustment, software required for setup and adjustment together with any required user licenses. The Contractor might be requested to demonstrate as confirmation the correctness of parameters or software before hand-over. This requirement is for all lifts, which are upgraded.

- **Proposed Project Program:**

Tenderers are to submit together with the tender document, a proposed project program in Microsoft Project format. The proposed program is to indicate lead-times for manufacture, shipping, installation and commissioning for each group of lifts/escalators. The proposed program should be realistic and achievable. Preference will be given to Tenderers who can provide the shortest but achievable lead-time.

- **Compliance:**

All complete units as well as any equipment supplied shall fully comply with the requirements of the Occupational Health & Safety ACT as well as any relevant SANS standard.

- **Finishes:**

- Landing Doors: All landing doors and frames where required are to be hairline stainless steel with vertical grain.
- Car interior: all supplied lift car panels including doors are to be hairline stainless steel with vertical grain.
- Car operating panels: All passenger lifts, excluding those which are to be equipped with Destination despatching systems are to have 2 car operating panels; each panel shall have an LED display located at the top of the car operating panel. Goods passenger lifts shall have only one car-operating panel with controls for independent service etc. housed in a lockable sub-panel below the car-operating panel.
- Passenger lift car flooring: all passenger lift cars are to be supplied with a minimum 30mm recess to facilitate the installation of ceramic floor tiles.
- Goods lift car flooring: all goods lifts are to be supplied with durable Norament flooring.

Details of all standard finishes are to be provided at tender stage.

- **Scrap:**

All scrap, obsolete and salvaged material remains the property of the Client, all existing lift material which is to be removed to facilitate the installation of new equipment is to be handed over to the Client or the Clients appointed representative for disposal or removal from site.

**REPLACEMENT, MAINTENANCE, REPAIRS OF LIFT AND RESPONSE TO
CALL-OUTS AT VARIOUS HEALTH FACILITIES WITHIN FREE STATE
PROVINCE.**

PART C3.5 SCHEDULE OF EQUIPMENT

1

PART C3.5

SCHEDULE OF EQUIPMENT

FACILITY NAME.....

CITY.....

MONTH AND YEAR.....

1. Patient Lift

Manufacturer:

Year of Manufacture.....

Car size and capacity in kg:

Design code:

Country of origin:

2. Passenger/Goods Lift

Manufacturer:

Year of Manufacture.....

Car size and capacity in kg:

Design code:

Country of origin:

Additional details can be added as an attachment with lift details. Basic new lifts details are included in the technical data, indicated as to be replaced. Note that the car dimensions should be maintained, where there are variances they should be indicated and discussed prior ordering of lifts.

Name Of Firm:.....

Signature:.....

Name (In Block Letters):.....

Address:.....

Telephone Number:.....

**REPLACEMENT, MAINTENANCE, REPAIRS OF LIFT AND RESPONSE TO
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PART C3.6 BILL OF QUANTITIES

PAGES (17)

REPLACEMENT, MAINTENANCE, REPAIRS OF LIFT AND RESPONSE TO CALL-OUTS AT VARIOUS HEALTH FACILITIES WITHIN FREE STATE PROVINCE.

PART C4 SITE INFORMATION

1. Site Locations

The sites are at various Department of Health owned institutions within the Free State Province. The institutions include hospitals, clinics, forensic mortuaries, medicine depots, laundries, EMS stations, office buildings and other specialised health facilities.

The Department reserves the right to cluster various institutions according to municipal boundaries/ Districts or any other criteria for which adjudication to contractors shall be awarded accordingly. The department reserves the right to contractor site allocation or allocation changes during duration of the contract.

2. Work Area

The working area will be all lifts, lift shafts and lift plantrooms in the institution. The department reserves the right to add or remove lifts on the contracts.

3. Occupied Site

The works undertaken will affect operations in the Health Facility and as such the contractor will be required to provide equipment to isolate areas been worked on so that operations in the Health Facility continue during the project implementation.

The onus will also be on the contractor to liaise with the facility management in terms of planning of work.

4. Access

Access to the sites are through security manned gates. Vehicles and individuals may be searched when accessing or exiting sites. The contractor must arrange temporary access cards for all his/her employees during the project implementation as access may be denied for unauthorised personnel. The Client reserves the right of admission to the premises.

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PART C5 DRAWINGS

Not Applicable

**REPLACEMENT, MAINTENANCE, REPAIRS OF LIFT AND RESPONSE TO
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PROVINCE.**

PART C7 OCCUPATIONAL HEALTH AND SAFETY SPECIFICATIONS

Attached



health

Department of
Health
FREE STATE PROVINCE

OCCUPATIONAL HEALTH AND SAFETY

SPECIFICATIONS

for

Maintenance of Lifts at Free State Department of Health facilities

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1. Introduction

This document describes the requirements of compliance to which the COMPETENT LIFT SERVICE PROVIDER / CONTRACTOR is to adhere in relation to the scope of works.

This document defines the minimum management requirement that is to be implemented by the COMPETENT LIFT SERVICE PROVIDER / CONTRACTOR for the management of Health and Safety on the project.

The aim of this document is to present the safety aspects that need to be controlled and managed on the project.

It is a requirement of Department of Health Free State that the Contractor shall provide a safe and healthy working environment and to direct all his activities in such a manner that his employees and any other persons, who may be directly affected by his activities, are not exposed to hazards to their health and safety. To this end the contractor shall take full responsibility to conform to all the provisions of the occupational health and safety Act (Act 85 of 1993), and all relevant regulations as stated in section 44 of Occupational Health and Safety Act 85 of 1993.

For the purpose of this contract the Contractor is required to confirm his status as mandatory to Department of Health Free State and employer representatives in his own right for the execution of the contract.

2. Scope of Application

This specification includes health and safety elements in terms of the Act and to satisfy the requirements of the Lift, escalator and passenger conveyor regulations and the Construction Regulations, which will be applicable to the Competent lift service provider and all sub-contractors for the safe execution of the following work:

- Working less than 30 day and working at a height less than 3 meters above ground or a landing.

3. Purpose

The purpose of this specification is to ensure that the Competent lift service provider and all sub-contractors provides and maintains, as far as reasonably a safe working environment for all employees and the public at large during the maintenance of lifts or the construction work.

4. Project Description

The project includes all activities shown on the project drawings and provisional bills of quantities. Additional work or changes to the contract may result in a change to the scope of work. The competent lift service provider shall make allowance for this in his Health and Safety Plan.

Competent lift service provider is required to submit detailed plan outlining the provision for the cost of health and safety measures.

The principle health and safety risks involved on this specific site will be that of:-

- Working at elevated position
- Usage of a crane and crane truck (where applicable)
- Usage of hand tools

5. Details of Specifications

5.1 Site Standards and Rules

- The contractor shall be responsible for enforcing and respecting all applicable health and safety rules in performance of all work covered by the contract, particularly those relative to the OHS Act and relevant regulations made under them;
- The competent lift service provider shall be responsible to ensure that the area is fenced during the maintenance work;
- The competent lift service provider shall develop a set of security rules and procedure to be maintained by all for entry of the project site;
- **Any deviation found shall be reported to the Health and Safety Manager of Department of Health Free State;**
- Access to site is controlled so that no unauthorised person may enter the site.
- No employees/visitor shall enter construction / maintenance site without undergoing induction training and be equipped with proper personal protective equipment;
- Contractor shall provide their workers with proper training so that they can perform their work safely. Train all staff to be aware of their own responsibilities for, and to provide information, instruction, and training on, the particular hazards and risks in relation to the scope of work; and

6. Safety File

The contractor shall appoint a suitable qualified person to prepare the Health and Safety File and to keep it to date for the duration of the contract. The health and Safety File shall include the following information:

- Notification of construction (where work involves working at a height greater than 3 meters above ground or a landing.
- Copy of OHS Act (updated) (General Administrative Regulation 4) and relevant regulations as stated by section 44 of OHS Act 85 of 1993.
- Proof of Registration and good standing with a COID Insurer.
- The contractor needs to provide full details of where his/her employee should be referred in case of an injury on duty.
- Copy Health and Safety plan that include the followings:
 - List of PPE issued
 - Recent inspection lists
 - Training records
 - Psychological tests
 - Hazards identification and risk assessment
 - Safe work procedure include fall protection plan, permits, locks-out procedures, method statements
 - Test records for equipment and work
 - Incident history

- Notices issued
- Health and safety expenses in respect of the project
- OHS programme agreed with client including the underpinning Risk Assessment and Method Statements (Construction Regulation 5(1))
- Design/ drawings where applicable
- A list of Contractors (subcontractors) including copies of the agreements between the parties and the type of work being done by each Contractor (Construction Regulation 9)
- Appointment/Designation forms required by the ACT and Regulations

Register required

- Lifting equipment (before use and monthly)
- Arc and Gas welding and Flame Cutting Equipment Inspections (before use daily)
- Construction Vehicles and mobile plant Inspections (Daily)
- Fire equipment inspection and maintenance (monthly)
- First aid (monthly)
- Hazardous Chemical Substances (MSDS and listing of chemicals)
- Inspection of cranes (daily before use and yearly inspection records)
- Inspection of ladders (daily before use and monthly)
- Inspection of vessels and pressure (monthly and 3 yearly)
- Machinery inspections (before use and monthly)
- Drivers/Operators of mobile plant/construction vehicles daily inspections

The Health and Safety File shall be handed over to the client on completion of the contract. It must contain all the documentation handed to the contractor by any contractors together with a record of all drawings, designs, materials used and other similar information concerning the completed project

6.1 Written Safe Work Procedures and Risk Assessments

- Written Safe Work Procedures are to be available in order to mitigate, reduce or control the hazards and risks identified in the Risk Assessment.
- Initially a generic document can be produced, by the first three weeks of operation a task based document must be produced and be updated as per changes in tasks.

6.2 Personal Protective Equipment

The Competent lift service provider shall ensure that the following minimum personal protective equipment and wear are issued to his employees:

- No person is allowed to be on site without the required PPE as prescribed by risk assessments.
- Competent lift service provider must ensure that PPE is being used as a last resort upon trying all reasonable means to remove the hazard.
- Competent lift service provider is required to keep an updated register of all PPE issued.
- Strict compliance measures must be administered to ensure employees use PPE.

- Hard hats, safety shoes with steel toe caps and protective clothing shall be provided free of charge for all his employees and shall be worn at all times. Other protective equipment such as gloves, safety glasses, face shield, dust mask, ear plugs etc shall be issued and used when required as per tasks in the risk assessment and safe work procedure. The Competent lift service provider shall ensure that his employees understand why the PPE is necessary and that they use them correctly and sign for receiving them.
- Only double lanyard safety harnesses are allowed and must be used when conducting work at elevated positions.
- When handling corrosive liquids e.g. acids or caustic suitable eye protection, gloves, and special overalls shall be worn.
- Ear protection shall be worn in any designated noise zone and a signage needs to be placed in the conspicuous place.
- Suitable respirators shall be provided where gas or dust pose a hazard
- Any person refusing to wear protective clothing when instructed to do so by the responsible person shall be removed from the site.
- Clearly outline the procedure to be followed when PPE is 1. Lost or stolen; 2. Worn-out or Damaged.

6.3 Appointment of Health and Safety Personnel

- The Competent lift service provider shall provide adequate levels of suitable trained, experienced and competent management and supervision to ensure that the works proceed and without risks to health or environment and that all operations and personnel for whom the contractor is responsible are adequately monitored and supervised.

The Competent lift service provider shall ensure that the appointments listed below are made where applicable:

Required appointments as per the Construction Regulations (CR):-

Item	Appointment
1.	Supervisor
2.	Safety Officer
3.	Person to carry out risk assessment
4.	Fall protection planner
5.	Temporary electrical installations inspector

6.4 Notification to Department of Labour

It is essential for the COMPETENT LIFT SERVICE PROVIDER to notify the Provincial Director of the Department of Labour, immediately upon receipt of the Letter of Acceptance of project commencement in accordance with the following requirements:

- The work exceeds 30 days or will involve more than 300 person days of construction work; and
- Includes working at a height greater than 3 meters above ground or a landing.

The notification must be done in Annexure A form for notification of construction work attached in this document in index.

A copy of the notification must be kept on site, available for inspection by inspectors, occupational health and safety unit representatives, employer, engineer, employees and persons on site.

6.5 Health and Safety Hazards

The Competent lift service provider shall take cognisance of the following hazards that are prevalent in the project:

6.5.1 Hazardous Environment

- Dust
- Fumes
- Noise
- Insufficient lighting
- Confined space
- Weather conditions – Heat/Rain/Wind/Cold
- Working at height and on elevated structures for work above 2-meter height (fall protection plans required)
- Working next to revolving equipment
- Working next to moving plant
- Working with chemical products

6.5.2 Hazardous Equipment

- Cranes
- Ladders
- Lifting equipment
- Pressure vessels
- Air compressors
- Chains and slings
- Fall protection equipments

6.5.3 Hazardous Operations

- DB Installations
- Welding
- Use of step ladder
- Usage of the carry picker by unauthorised personnel

6.5.4 Hazardous Tools

- Angle grinders
- Electric hand tools
- Circular saws
- Welding units – arc and gas
- Explosive power tool

7 Arrangements for controlling significant site risks

All safe operating procedures, method statements or rules implemented mitigate the risk whilst performing hazardous tasks are to be effectively communicated to the contractor's staff performing the tasks.

8. Fire precautions on sites

The provisions of the environmental Regulations for Workplaces (Government Notice R2281 of 16 October 1987) shall apply. No open fire will be allowed on site, unless a proper arrangement with project manager has been made.

All fire extinguishers shall be inspected monthly and tested and serviced at recommended intervals by an accredited supplier.

9. Communication & Liaison

- Occupational Health and Safety liaison between the Competent lift service provider, the Contractors and other concerned parties shall be through the project manager.
- In addition to the above, communication may be directly to the Department of Health Free State OHS Manager or his appointed Agent, verbally or in writing, as and when the need arises.
- Competent lift service provider will be responsible for the distribution of all relevant Occupational Health and Safety information to other Contractors.

10. Fall protection plan

A comprehensive fall protection plan is to be established in order to prevent employees from falling from elevated positions

- Competent lift service provider shall stop all persons working with the usage of a ladder during periods of inclement weather or if the possibility of lightning is present;
- Safety harness as fall arrest devices will be worn when working at an elevation, unless working from a safe platform;
- Working on elevated positions shall only be carried out under the supervision of a competent person;
- Provision must be made to prevent objects and material from falling from elevated areas and the protection of persons working below;

- All unprotected openings in floors, edges, slabs, hatchways and stairs will be adequately barricaded and suitable visible means will be used to demarcate such barricading;
- Where necessary life lines will be installed for the purpose of fall protection;
- All unprotected opening need to be protected and barricaded.
- All personnel working at height exceeding 2 metres will be declared medically and psychological fit and records being kept in the safety file.
- All personnel working at the elevated position shall be trained and records thereof be kept inside the safety file.

11. Permit to work

The contractor is to ensure that the proper permit is in hand and duly authorised by appointed person before commencing with the work in question, some of the activities that require a permit to work are:

- Hot works
- Working in confined spaces
- Excavation work more than 1.5 meters deep
- Work being done next to live overhead power line
- Use of hazardous chemical substances (all MSDS shall be available and kept in the safety file), Department of Health Free State OHS Manager shall be informed of all chemicals used on site or to be used.
- Work to be carried near/adjacent to live electrical network. Work permit shall be requested by the project manager representing Department of Health Free State and it shall be issued by Department of Health Free State OHS Manager. Work will be carried out under the supervision of Department of Health Free State representative project manager and contractor shall sign acknowledgement letter to understand the risks associated with that specific work.

Contractor shall liaise with project manager from Department of Health Free State for the issue of work permit.

12. Housekeeping on Site

The Competent lift service provider shall ensure a high level of housekeeping on site. Adequate care must be taken by the contractor to ensure that storage and stacking is correctly and safely carried out. On completion the contractor is responsible for clearing the site of all material, scrap, temporary building to the satisfaction of the Department of Health Free State representative.

13. First Aid Facilities

- First aid box shall be available on site.

14. Health and Safety Induction

- The Competent lift service provider shall ensure that all employees undergo a health and safety induction.
- Proof of induction is to be included in the "Safety File".

- The contractor is expected to have a daily safety “tool box” meeting. Subject topics that are applicable to the job at hand e.g. near misses that have happened, accident and up and coming work will be discussed along suggestion and comments.
- These meetings can be used as a training meeting with the central idea of educating employees.

15. Accident/incident reporting and investigations

15.1 Reporting of incidents and occupational diseases

All accidents and incidents shall be reported the same day to Department of Health Free State OHS Manager.

Section 24 of the Act refers to certain incidents occurring at the workplace, or in connection with the use of machinery whereby a person dies or is injured to be extent where he is likely to die or could have resulted in a major incident. Such incidents should be reported to the Provincial Director on a WCL 1 or WCL 2 form within seven days.

Certain other types of incidents must be reported to the Provincial Director telephonically, facsimile or similar means of communication and these types of incidents are as follows—

- (a) Where a person, as a result of the incident;
 - i) Dies;
 - ii) Becomes unconscious;
 - iii) Suffers the loss of a limb or part thereof;
 - iv) Is injured to the extent that he is likely to die;
 - v) Is injured to the extent that he is likely to be permanently disabled;
 - vi) Is injured to the extent that he is likely to be off for a period of 14 days or more;
 - vii) Cannot perform his normal duties (those duties for which he was employed).
- (b) An incident of major consequence arising out of the use of industrial equipment or machinery or industrial practices at a workplace.
- (c) The health and safety of any person is endangered and where –
 - i) A dangerous substance was spilled;
 - ii) The uncontrolled release of any substance under pressure (pressure greater than 1 atmosphere) took place;
 - iii) Machinery or any part thereof fractured or failed, resulting in flying, falling or uncontrolled moving objects; or
 - iv) Machines, which ran out of control.

These incidents should also be recorded and investigated in accordance to Regulation 8 of the General Administrative Regulations.

If an injured person is to die as a result of an incident, which has already been reported in terms of the above, the employer or user should report such death to the Provincial Director.

15.2 Recording and investigation of incidents

The employer or user of machinery should keep record and investigate all incidents referred to in terms of Section 24 of the Act together with any other incident, which resulted in the person concerned having had to receive medical treatment other than first aid.

These incidents must be recorded in the form of Annexure 1 of these regulations and be kept for a period of at least 3 years. This record shall be kept on the premises and available for perusal by an inspector.

The contractor, a designated person must investigate the above-mentioned incidents. This investigation should take place within 7 days from the date of incident and completed as soon as is reasonable practicable or within the contracted period of contract workers. The employer should record the result of the investigation in the Annexure 1. The purpose of the investigation is to establish the cause of the incident together with the safety measures that can be implemented to prevent the re-occurrence of such incidents in the future.

- Accidents/incidents are to be reported to Department of Health Free State Project Manager.
- All reportable incidents in terms of Section 24 of the OHS ACT shall be investigated and recorded by the contractor as required by the Act and also reported to Department of Labour.
- The contractor shall compile an investigation report and ensure that all the preventative actions recommended are in place.

16 Responsibilities

16.1 Client

16.1.1 The Client will appoint Competent lift service provider in writing for assuming the role of Competent lift service provider in order to comply with the provisions of the Lift escalator and passenger conveyor regulations and the Construction Regulations.

16.1.2 The Client or his appointed Agent on his behalf will take reasonable steps to ensure that the health and safety plan of both the Competent lift service provider and Contractor is implemented and maintained. The steps taken will include periodic audits at intervals of at least once every month.

16.1.3 The Client will prevent the Competent lift service provider from commencing or continuing with construction/maintenance work should the Competent lift service provider and/or his Contractors at any stage in the execution of the works be found to:

- have failed to have complied with any of the administrative measures required by the Occupational Health and Safety Act and relevant regulations;
- have failed to implement or maintain their health and safety plan;
- act in any way which may pose a threat to the health and safety of any person(s) present on the site of the works or in its vicinity, irrespective of him/them being employed or legitimately on the site of the works or in its vicinity.

16.2 Competent lift service provider

- 16.2.1 The Competent lift service provider shall accept the appointment under the terms and Conditions of Contract. The Competent lift service provider shall sign and agree to those terms and conditions and shall, before commencing any work on heights, notify the Department of Labour of the intended construction work in terms of Regulation 3 of the Construction Regulations. Annexure B of this Specification contains a "Notification of Construction Work" form. The Competent lift service provider shall submit the notification in writing prior to commencement of work and inform the Client.
- 16.2.2 The Competent lift service provider shall ensure that he is fully conversant with the requirements of this Specification and all relevant health and safety legislation. This Specification is not intended to supersede the Act nor the Construction Regulations or Lift escalator and passenger conveyor regulations and the Construction Regulations. Those sections of the Act and the Construction Regulations which apply to the scope of work to be performed by the Competent lift service provider in terms of this contract (entirely or in part) will continue to be legally required of the Competent lift service provider to comply with. The Competent lift service provider will in no manner or means be absolved from the responsibility to comply with all applicable sections of the Act or any Regulations proclaimed under the Act or which may perceivable be applicable to this contract.
- 16.2.3 The Competent lift service provider shall provide and demonstrate to Department of Health OHS Manager a suitable and sufficiently documented health and safety plan based on this Specification, the Act, the Construction Regulations and Lift escalator and passenger conveyor regulations and the Construction Regulations, which shall be applied from the date of commencement of and for the duration of execution of the works. This plan shall, as appendices, include the health and safety plans of all Sub-contractors for which he has to take responsibility in terms of this contract.
- 16.2.4 The Competent lift service provider shall provide proof of his registration and good standing with the Compensation Fund or with a licensed compensation insurer prior to commencement with the works.
- 16.2.5 The Potential Competent lift service provider shall, in submitting his tender, demonstrate that he has made provision for the cost of compliance with the specified health and safety requirements, the Act and Construction Regulations. (Note: This shall have to be contained in the conditions of tender upon which a tenderer's offer is based.)**
- 16.2.6 The Competent lift service provider shall consistently demonstrate his competence and the adequacy of his resources to perform the duties imposed on the Competent lift service provider in terms of this Specification, the Act and the relevant regulations.
- 16.2.7 The Competent lift service provider shall ensure that a copy of his health and safety plan is available on site and is presented upon request to the Client, an Inspector, or Employee.
- 16.2.8 The Competent lift service provider shall ensure that a health and safety file, which shall include all documentation required in terms of the provisions of this Specification, the Act and the relevant Regulations, is opened and kept on site and made available to

the Client or Inspector upon request. Upon completion of the works, the Competent lift service provider shall hand over a consolidated health and safety file to the Client.

16.2.9 The Competent lift service provider shall, throughout execution of the contract, ensure that all conditions imposed on his Sub-contractors in terms of the Act, Construction Regulations and Lift escalator and passenger conveyor regulations and the Construction Regulations are complied with as if they were the Competent lift service provider.

16.2.10 The Competent lift service provider shall from time to time evaluate the relevance of the Health and Safety Plan and revise the same as required, following which revised plan shall be submitted to the Client.

17. Health and Safety Inspections/Audits

- ~~The Competent lift service provider shall ensure that the work area, equipment, machinery, safety equipment and wear, etc are inspected on a regular basis.~~
- Proof of such inspections are to be maintained in the "Safety File"
- All non conformances revealed during the inspections are to be noted and rectified as soon as possible. The client, health and safety unit will also conduct formal audits at least once a month and deviations that are revealed must be rectified within the required time frame.
- All portable tools shall be inspected daily by the user as well as weekly recorded inspections and testing to be done.

18. Emergency Preparedness

The Competent lift service provider shall ensure that the necessary fire fighting equipment is in place in respective areas. Emergency preparedness plan shall ensure that all emergency contact details are placed in a conspicuous place where they can be easily seen and accessed.

19. Non Compliance to Health and Safety Standards

Department of Health Free State OHS Manager reserve the right to stop the operations of the Competent lift service provider should it be found that the operations are being undertaken in non compliance with the laid down health and safety plan based on this specification.

It should be noted to the contractors that any expenses incurred due to non-compliance shall be for Contractor's account in question.

Safety officers and other personnel have the authority to stop work if there is a life threatening situation or danger of material loss/damage and direct immediate remedial action under the supervision of contractor's manager is required.

Any "stop work order" shall be followed up and the site manager shall present a written report including remedial actions to avoid the re-occurrence and disciplinary action for contravening safety regulation and if considered necessary to instruct the site manager to remove certain of his personnel from site.

NOTIFICATION OF CONSTRUCTION WORK - Regulation 3 of the Construction Regulations, 2014

1. (a) Name and postal address of competent lift service provider:
.....
- (b) Name and telephone number of competent lift service provider's contact person:
.....
2. Competent lift service provider's compensation registration number:
.....
3. (a) Name and postal address of client:
.....
- (b) Name and telephone number of client's contact person or agent:
.....
4. (a) Name and postal address of designer(s) for the project:
.....
- (b) Name and telephone number of designer's contact person:
.....
5. Name and telephone number of competent lift service provider's construction supervisor on site appointed in terms of regulation 6(1):
.....
6. Name/s of competent lift service provider's sub-ordinate supervisors on site appointed in terms of regulation 6(2):
.....
7. Exact physical address of the construction site or site office:
.....
8. Nature of the construction work:
.....
.....
9. Expected commencement date:
10. Expected completion date:
11. Estimated maximum number of persons on the construction site:
.....

12. Planned number of contractors on the construction site accountable to competent lift service provider:

.....

13. Name(s) of contractors already chosen:

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.....

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Competent lift service provider

.....

Date

.....

Client

.....

Date

-
- THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR
PRIOR TO COMMENCEMENT OF WORK ON SITE.

**Department of Health Free State OHS Manager contact details:
(Infrastructure and Engineering Services Management Services)**

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