

**Ministry of Health & Family Welfare
(GOVERNMENT OF INDIA)**

Ministry of Health & Family Welfare

Nirman Bhavan, Maulana Azad Road
New Delhi – 110011

Tender for

**Supply, Installation, Testing & Commissioning of
Lifts for Housing Complex for AIIMS Like
Institution at Bhubaneswar (Orissa) under PMSSY**

Volume - IV

TECHNICAL SPECIFICATIONS

Tender No. HSCC/PMSSY/BHUB/LIFT/2012

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Consultant

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1.00 LIFT INSTALLATION

1.01 The scope of work shall cover design, supply delivery, installation, testing and commissioning of passenger lifts including its approval from the statutory authorities. The scope of work shall also include the following item of civil works.

- a) Necessary scaffolding temporary barricade in the hoistway required during the erection of the elevators.
- b) Minor civil work comprising of cutting holes and making good the car and counterweight rail brackets, hall buttons and indicators including laying of sills in position.
- c) Steel items such as machine beams, bearing plates buffer support channels, sill angles and fascia plates etc.
- d) Suitable trap doors with steel chequered plate covers.
- e) Providing and install a suitable vertical iron ladder for access to the pit.
- f) Any other item required for successful completion and commissioning of lifts. (including the hoisting beam in the machine room)

1.02 The work shall be done in accordance with regulations of any local code and following ISI codes which govern the requirements of installations.

IS: 1860-1980 code of practice for installation, operation and maintenance of Electric Passenger and Goods Lifts.

IS: 3534-1976 Outline dimensions of Electric Lifts.

IS: 4666-1980 Specifications for Electric passenger and Goods Elevators.

Indian Electricity Act 1910.

Indian Electricity Rules, 1956.

Delhi Lifts Rules, 1942.

CPWD general specifications for lift & escalators-2003, Part-III ammended up to date.

1.03 SHOP DRAWINGS AND APPROVAL OF ELECTRICAL INSTALLATION:

The selected tenderer shall prepare a furnish shop drawings for approval by The Client, such shop drawings shall be based on the Architectural drawings and requirements laid down in specifications, local laws and regulations etc.

The detailed drawings shall be submitted within one month of placement of order. The successful tenderer shall obtain the approval of electrical Inspector and other local authorities as per requirements before submitting the drawings to Client/ Engineer. The

contractor shall not proceed with in installation work till the drawings are approved by the Engineer-in-Charge. Expenses incurred such as license fee etc. towards obtaining the approval of Electrical Inspector, local authority shall be reimbursed to the contractor as per actual on production of documentary proof.

Approval of contractor's drawings shall not absolve the contractor of any of his obligations to meet the requirements of specification under this contract

Five sets of completion drawings operation manual, maintenance manual, spare parts details shall be submitted to the Client/ Engineer after completion of work.

1.04 GUARANTEE

The tenderer shall guarantee the equipment against all defects of materials and workmanship for a period of one year from the date of commissioning of the equipment as certified by the owner. Any defects arising during the guarantee period shall be rectified and replaced by the tenderer, at his own expense, to the satisfaction of the owner.

1.05 PERMITS, INSPECTION & LICENSE FEE

The contractor shall arrange all necessary local, provincial or national government permit and shall make arrangements for inspection and tests required thereby. Expenses to be borne by purchaser.

1.06 MAINTENANCE

After the completion of the installation and before handing over of each elevator by the elevator contractor, maintenance service for the equipment furnished shall be provided for a period of twelve (12) months. This service shall include regular examination of the installation by trained employees, and shall include all necessary adjustments, greasing oiling, cleaning supplies and genuine standard parts to keep the equipment in proper operation, except any parts made necessary by misuse, accident or neglect caused by other. Contractor shall provide 24 hours Emergency local call back service facility and shall furnish full details of such facilities available.

1.07 POWER SUPPLY

The apparatus shall be designed to operate on 415 + 10% - 20% Volts, 3 Phase, 4 wires, 50 Hz A.C. Supply for illumination signal equipment shall be 240 Volts single phase 50Hz A.C..

1.08 ELECTRICAL WIRING

The necessary A.C. supply of 3 Phase, 415 Volts 50 HZ shall be made available in the machine room. All the electrical works beyond the main supply switch shall be carried out by the contractor i.e. supply and installations of panels for drive motors, switches and control complete with wiring as per system requirement and approval of the Engineer. The wiring shall be carried out strictly in accordance with Indian Electricity Rules and Indian code of Practice for Electrical Wiring Installation IS-732-1963 System Voltage not exceeding 650 V). For works not covered under any of the above wiring rules, the

13th edition of Electrical Engineers (Condense) shall apply. The cable and conduits to be used shall be of suitable size and grade conforming to relevant IS specification. Wiring for LT switchboard to the motor terminal shall be with heavy duty 1.1 KV grade PVC insulated PVC sheathed, armoured aluminium cable. All the trailing cables used for control and safety device shall conform to IS: 4289-1967, Specifications for lifts cables. The trailing cable circuits for controls, safety devices, lighting and signaling shall be separate and distinct.

Power wiring between controller and main board to various landings shall be drawn in suitable size heavy gauge conduit stove enameled/painted conforming to I.S specifications.

The Voltage and frequency of the supply shall be subjected to variations permissible under Indian Electricity Acts and Rules.

1.09 PARTICULAR SPECIFICATIONS

- 1.09.1** TYPE : Passenger Lifts.
- 1.09.2** NO. OF ELEVATORS : As Per Bill of Quantities.
- 1.09.3** CAPACITY : As Per Bill of Quantities.
- 1.09.4** SPEED : As Per Bill of Quantities.
- 1.09.5** FLOORS SERVED/RISE : As Per Bill of Quantities.
- 1.09.6** STOP : As Per Bill of Quantities.
- 1.09.7** OPENINGS : (All Openings on same side).
As Per Bill of Quantities.
- 1.09.8** OPERATION : Simplex Collective as per BOQ.

1.09.9 CAR FRAME:

The car frame, which supports the car platform and enclosures, shall be made of structural steel and equipped with suitable guides and a car safety device mounted underneath the car platform. The hoist ropes shall include adjustable self/ aligning hinges.

The car shall be so mounted on the frame that vibration and noise transmitted to the passenger is minimized.

1.09.10 CAR SAFETY AND GOVERNER :

Suitable car safety to stop the car whenever excessive descending speed is attained shall be operated by a centrifugal speed governor connected to the governor through a continuous steel rope.

The governor shall be provided with self tensioning device to keep governor rope in proper tension even after rope stretch. Suitable means shall be supplied to cut off power from the motor and apply the brake on application of the safety.

1.09.11 COUNTER BALANCE :

A Suitable guided structural steel frame with appropriate filler weights shall be furnished to promote smooth and economic operation.

1.09.12 TERMINAL AND FINAL LIMITS :

Terminal limit switches shall be provided to slow down and stop the car automatically at the terminal landings within permissible over travel and final limit switches shall be provided to automatically cut off the power and apply the brake, should the car travel beyond the permissible over travel. They shall act independently of the operating devices and buffers.

1.09.13 TERMINAL BUFFERS :

Heavy duty spring buffers shall be installed as a means of stopping the car and counterweight at the extreme limits of travel. Buffers in the pit shall be mounted on steel channels which shall extend between both the car and counterweight rails.

1.09.14 CONTROLLER :

A Controller shall be provided to control starting stopping and speed of the elevator motor and also be automatically able to apply the brake if any of the safety devices operate or if power fails from any cause. In case of power failure and again restore of power the lift shall land to next floor and shall not go to basement/lowest level. Suitable software/hardware or rescue device shall be provided.

1.09.15 REVERSE PHASE RELAY:

A reverse phase relay shall be provided on the controller which is designed to protect the lift equipment against phase reversal and phase failure.

1.09.16 GUIDES:

Machined steel tee guides shall be furnished for the car and counterweight. The guide rails should be of steel solid and shall have tongued and grooved joints. Sliding clips shall be used for fastening the guides to allow building settlement without distorting the guide rails. To keep down the noise level and to reduce wear and tear of the sections, only Nylon Ribs shall be used in the guide shoes, after smoothening of the rails. The flanges shall be machined for the fish plate mounting such that rail alignment at joints almost remain constant.

1.09.17 FOUNDATIONS:

The machine shall be placed directly above the hoistway upon the machine room slab provided by the Owner.

1.09.18 ROPES:

The elevator shall be provided with traction steel ropes. Steel wire rope having a tensile strength of not less than 12.5 Ton/cm² of good flexibility shall be used for lift. The lift rope shall conform to IS: 14665 – (Part-4- Sec-8):2001.

1.09.19 MACHINE :

The machine shall be of the single wrap traction type and shall include a motor, electromechanical brake, steel worm, bronze gear, steel sheave shaft and Farrow-Molybdenum sheave all compactly mounted on a single base or bed plate. The worm shaft shall be provided with ball bearings to take the end thrust and roller bearings shall be furnished for the sheave shaft to ensure alignment and long bearing life. The driving sheave shall be grooved to ensure sufficient traction and minimize rope wear. Shall be provided for all bearings and the worm gear.

1.09.20 BRAKE :

The direct current brake shall be spring applied and electrically released and designed to provide smooth stop under variable loads. The brake should be capable of operation automatically by various safety devices, current failure, and by normal stopping of car. It should be possible to release the brake manually, such releases requiring the permanent application of manual force so as to move the lift car in short times. For this purpose one set of brake release equipment shall be supplied.

1.09.21 MOTOR :

The motor shall be suited to the service proposed and arranged for adequate lubrication. The motor shall be class F insulation and one (1) hour rated squirrel cage induction type having high starting torque. It shall also be provided with Thermistors embedded in the stator windings for the highest degree of thermal motor protection.

1.09.22 CONTROL

The control shall be variable voltage variable frequency A.C. variable voltage, closed loop control system using solid state devices and electronic speed pattern generator to command the motor from a velocity transducer and load compensation circuits for a comfortable ride.

In Normal operation, the electromagnetic brake shall only be applied when the lift has come to a complete standstill. The brake shall only be meant for holding the lift in position at every landing, providing stopping without any jerking effect.

Each controller cabinet containing memory equipment shall be properly shielded from the pollution.

MICROPROCESSOR

The control shall employ a microprocessor working on a program such that precision leveling and highly efficient handling of passengers for least possible waiting and reduced travel time is ensured. The microprocessor system should be designed to accept

programming with minimum downtime. It should be able to monitor the state of input calls (such as car calls from COP and hall calls from hall fixtures) and output commands such as starting, decelerating and stopping the elevator. It should be able to generate floor location data, thereby, providing a reference position to establish the safety zones for door opening and closing, and also to initiate leveling slowdown.

1.09.23 DUPLEX COLLECTIVE OPERATION

The operation shall be duplex collective with/without attendant for each elevator and shall consist of the following:-

IN THE CAR

There shall be furnished a flush type attractively finished stainless steel panel which contains a series of luminous buttons numbered to correspond to the landings served, an emergency stop switch and an emergency call button connected to a bell which serves as an emergency signal.

AT HOISTWAY LANDINGS

There shall be provided an UP luminous push button and a DOWN luminous push button at each intermediate landing and a single button at the terminal landings.

The car shall not start unless the door is in the closed position and all hoistway doors are closed in the locked position.

If the car is idle and one or more car or landing buttons above the landing at which the car is standing are pressed, the car shall start in the UP direction and proceed to the highest landing for which any button is pressed and stops at intermediate landing for which a car button or up landing button is pressed sufficiently in advance of the car's arrival at such landings to permit these stops to be made. After each stop, the car shall proceed in the UP direction until it reaches the highest landing for which a call is registered. The car shall not stop on the UP trip at any landing in response to a DOWN call.

Similarly, if the car is idle and one or more car or landing buttons below the landing at which the car is standing are pressed, the car shall start in the DOWN direction, proceed to the lowest landing for which any button is pressed and stop at each intermediate landing for which a car button is pressed.

When the car is idle and a button for a landing above the car and a landing below the car are pressed, the car shall start towards the landing corresponding to the button pressed first. The call registered for the landing in the opposite direction from the car shall be answered after the car has responded to the farthest call in the direction established by the button pressed first.

A time relay shall hold the car for an adjustable interval of few seconds at the landings at which stops are made to enable passengers to enter or leave the car.

OPERATION WITH AN ATTENDANT

The regular car operating panel shall include buttons, switches, etc. for the collective-automatic control and shall also include.

A two-position key-operated switch marked to indicate ATT (attendant operation)

A buzzer: UP and DOWN direction light jewels and A non-stop button.

A car operating panel shall also include an UP and DOWN button.

When the key-switch is in the position of WITH ATTENDANT, the direction light and buzzer shall become operative and the UP and DOWN direction button in the regular car operating panel shall be made effective for the attendant operation.

When an attendant operation, the car and hoistway doors shall open automatically at each stop but the closing of the doors shall be subject to the UP or DOWN direction buttons. As a visual signal to the attendant, the UP and DOWN direction jewel shall illuminate upon registration of either car or landing calls to indicate the direction of the travel of the car. The attendant shall operate the elevator normally in the direction indicated by the direction jewel but, if desired, opposite direction travel may be realized by pressure of a car button for a landing in that direction from the car.

The pressure of a direction button shall cause the doors to close and the car to start in the direction desired, provided a call is registered for that direction. If pressure of the direction button is released before the car starts, the doors will re-open and car shall not travel. It shall so arrange the pressure on direction button can be released, once the car has started.

Continuous pressure of the nonstop button shall cause the car to by-pass all landing calls and respond only to registered car calls.

1.09.24 CAR ENCLOSURES :

The car enclosures shall be of sheet steel and shall be of an elegant design comprising of the following :

- a) Suspended ceiling with light diffuser Perspex ceiling and fluorescent light.
- b) Concealed pressure fan with grille in suspended ceiling. The lift shall have sensor so that the fan is operation only when if there is at least one person inside the lift.
- c) Ceiling steel painted white.
- d) Complete M.S. car enclosure finished with powder coating for passenger Lifts
- e) PVC flooring (with 3mm thick tiles of approved shade)
- f) Mirror on one face (front face when we enter the car)

1.09.25 CAR DOOR

The car entrance shall be provided with stainless steel sliding doors in powder coated finish giving a clear opening for passenger lift as per CPWD specifications for electrical works –Part-III – Lifts & Escalators, amended upto date,shall be provided.

1. 09. 26 HOISTWAY DOORS :

At each landing, a center opening , M.S. horizontal sliding door in powder coated finish giving a clear opening as per CPWD general specifications for electrical works –Part-III – Lifts & Escalators, amended upto date, shall be provided.

1. 09. 27 SIGNAL AND OPERATIVE FIXTURES :

The following signal and operative fixtures shall be provided for each lift in stainless steel face plates except in fireman's switch which shall have a glass face plate.

a) CAR OPERATING PANEL

There shall be one (1) No. panel in car, with hinged stainless steel face plate and shall comprise illuminated floor buttons, door open and emergency stop controls emergency call buttons, door open and emergency stop controls emergency call button, two position key operated switch, a Buzzer, UP and DOWN direction light panels, a non stop button, and an integral interphone. The jewels and accentuator shall be of modular construction, face plate mounted, rewired using snap on lugs.

b) HALL BUTTONS AND HALL POSITION INDICATOR

There shall be provided combined signal fixture (one riser) of compact design and of attractive hairline stainless steel face plate at the elevator entrance on each floor which for terminal landings shall have a single luminous push button and for intermediate landings shall have an UP luminous push button and a DOWN luminous push button. The jewels shall be of modular construction mounted on a stainless steel face plate. Whenever a button is pressed, the jewel shall light up to indicate registration of the call and shall remain enlightened till the car arrives.

c) CAR POSITION INDICATOR IN CAR

This shall be of compact design and of attractive hairline finish stainless steel face plate with easy to read digital display of the floors, indicating through which floor the elevator is passing or on which floor the elevator is stopped. This shall also incorporate illuminated arrows showing the direction of travel.

d) BATTERY OPERATED ALARM BELL AND EMERGENCY LIGHT

A solid state siren type alarm unit operated by 2 Nos. 9 volt rechargeable Nickel Cadmium batteries shall be provided which shall give a waxing and waning siren when alarm bell in the car is pressed momentarily.

An emergency light unit using a 9 volt dry battery power pack and incandescent lamp with stainless steel face plate shall be provided inside the car which shall operate automatically in the case of power failure.

e) OVERLOAD WARNING

Overload warning radars with audio-visual indication (visual indication shall show OVERLOADED) with stainless steel face plate shall be installed in the elevator car, so that when there is overload in the car the sign shall light up a flash indicating OVERLOADED and a buzzer shall operate during this period and the doors shall remain open until the overload is removed.

f) FIREMAN'S SWITCH

A toggle switch covered by a glass cover shall be provided on the ground floor for each elevator which shall permit a fireman to call the elevator to the ground floor by canceling all car and landing calls. The elevator shall then stop at the ground floor with the door open to permit the fireman to have exclusive use of the elevator without any interference from the landing calls.

g) INTERPHONE

Interphone shall have one master unit in each machine room, one master unit on the ground floor for each 1 (outside hoistway) and one slave unit in each elevator car.

1. 09. 28 ELECTRIC DOOR OPERATOR FOR CAR DOOR AND HOISTWAY DOOR :

An electric door operator for opening and closing the car door shall be provided. The opening of a car and hoistway doors shall be such that the doors shall start opening immediately for so that by the time the elevator stops completely, the elevator and hoistway doors shall be fully open.

The equipment shall consist of a machine on the elevator car operating the car door when the car is stopping at a landing.

The car door and hoistway door shall be mechanically connected and shall move simultaneously in opening and closing.

The car and hoistway doors shall be power opened and closed and shall be checked in opening and closing with an oil cushioning mechanism built into the gear unit.

Each hoistway door shall be provided with an interlock which will prevent movement of the car away from the landing unit.

The doors are closed in the closed position as defined in the ISI codes.

An electric contact for the car door shall be provided which shall prevent car movement from the landing unless the door is in the closed position as defined in the ISI codes. The locking arrangement shall be so designed that the electrical circuit cannot be completed unless the doors are in the closed position and mechanical latching is effected.

Necessary switches shall be provided in the elevator machine room to control the operation of the doors.

The car and hoistway, doors shall open automatically as the car is stopping at a landing. The closing of the car and hoistway door must occur before the car can be started. Doors can be stopped and reversed during their closing motion.

1.09.29 DOOR HANGER AND TRACKS :

For the car and each landing door, sheave type two point suspension hangers complete with tracks shall be provided. Means shall be provided to prevent the door from jumping off the track and for vertical and lateral adjustment of doors.

Sheaves and rollers shall be of steel and shall include shielded ball bearing to retain grease lubrication. Adjustable ball bearings rollers shall be provided to take the upward thrust of the doors. Tracks shall be of suitable steel section with smooth surface. The locking of the two leaf parting type doors should be positive.

1.09.30 SAFETY SHOE :

A safety shoe (one on each door panel) shall extend to the full height of and project beyond the front edge of the car door.

Should this shoe touch a person or an object while the car door is closing, the car and hoistway doors shall return to the open position. The doors shall remain open until the expiration of a pre-determined interval and then close automatically.

1.09.31 LANDING ENTRANCE MATERIAL'S:

These shall consist of headers, extruded aluminium sills and strut angles.

1.09.32 WIRING :

Complete wiring in the equipment.

1.09.33 AUTOMATIC RESCUE DEVICE:

Automatic Rescue Device to be provided for all the lifts with battery backup so that it can land to the nearest level in case of power failure. Automatic Rescue Device shall have suitable battery backup so that it can operate minimum seven times in a day provided the duration between usage is at least 30 minutes.

END OF VOLUME-IV