













COMMERCIAL PASSENGER LIFTS

PROJECT SPECIFICATION



-  Altvate
Commercial Passenger Lifts
-  Altvate Home
Domestic Passenger Lifts
-  Altvate Interior
Lift Interiors
-  Altvate Renew
Lift Modernisation
-  Altvate Rise
Goods Only / Service Lifts
-  Altvate Mobility
Wheelchair / Access Lifts
-  Altvate Move
Escalators / Moving Walks
-  Altvate Park
Car Stackers

-  Altvate Design
Design / Consult
-  Altvate Action
Service / Repair / Maintain

Concept to Completion
Flexibility in Design & Personalised Service

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PROJECT DESCRIPTION

Provide an overview of the project and the lift equipment required.

This work includes the design, supply, delivery, installation, testing, commissioning and maintenance during the contract period of:

Building name

- ④ One single passenger lift (numbered ???)

GENERAL REQUIREMENTS

MANUFACTURER

The equipment shall be an Altivate, manufacturer shall be City Lifts, or an approved equivalent that can meet the performance and quality requirements of the technical specification. Alternative manufacturers will be assessed according to the following criteria:

- ④ Performance
- ④ Quality
- ④ Years of presence in Australia
- ④ Experience with projects of a similar size and nature
- ④ Product warranties
- ④ After sales service and support capability
- ④ Availability of spare parts

PERFORMANCE

The alternative must meet or exceed the performance parameters of the specified herein.

QUALITY

The alternative must be of equal or better quality to that specified herein with respect of materials, methods of fabrication, compliance with codes and standards, etc.

PRESENCE IN AUSTRALIA

The alternatives must be sourced from manufacturers that are a registered Australian company which will be responsible for guaranteeing all product performance and quality warranties.

PROJECT EXPERIENCE

The contractor shall be able to demonstrate that the proposed alternatives have been successfully employed in projects of a similar size and nature to this project.

PRODUCT WARRANTIES

The proposed alternatives shall be provided with equipment warranties at least equal to that of the specified herein, but in no case less than 12 months.

AFTER SALES SERVICE AND SUPPORT CAPABILITY

The contractor shall provide documentary evidence that the alternatives are supported by an organisation which can provide a level of after sales service and support equivalent to what is specified herein.

AVAILABILITY OF SPARE PARTS

The contractor shall provide documentary evidence that the alternatives are supported by an organisation which holds a level of spare parts equivalent to the nominated equipment.

REGULATIONS

AS1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation

AS1735 Lifts, escalators and moving walks

AS4431 Guidelines for safe working on new lift installations in new constructions

AS4836 Safe working on or near low-voltage electrical installations and equipment

AS/NZ 3000 Wiring Rules

EN81-20 Safety rules for the construction and installation of lifts – Lifts for the Transport of Persons and Goods: Passenger and Goods Passenger Lifts

EN81-50 Safety rules for the construction and installation of lifts – Examinations and tests. Design rules, calculations, examinations and tests of lift components

EN81-80 Safety rules for the construction and installation of lifts. Existing lifts. Rules for the improvement of safety of existing passenger and goods passenger lifts

EN115-2 Safety of escalators and moving walks – Rules for the improvement of safety of existing escalators and moving walks

EN13015 Maintenance for Lifts and escalators– Rules for Maintenance instructions

AS/NZS ISO 31000 Risk management

ISO14798 Lifts (elevators), escalators and moving walks – Risk assessment and reduction methodology

ISO25745 Energy performance of lifts, escalators and moving walks

NCC 2016 National Construction Code

Federal Disability Discrimination Act 1992 (D.D.A.)

Local City Council

Department of Fire and Emergency Service

Worksafe Western Australia

TENDER DRAWINGS

The architectural drawings show the space provided to accommodate the lift.

CONTRACT SUBMITTALS

A. Brochure. Submit manufacturer's brochure for each system proposed for use, including the following:

1. Cabin design and layout.
2. Landing door and frame details.

B. Shop Drawings. Submit layout drawings or product literature including the following:

1. Maximum loads and reactions on the building structure created by the movement of the lift.
2. Locations of bond blocks.
3. Location and dimensions of all openings required in shafts and at landings for call buttons and lift car position indicators.
4. Construction details and dimensions of the lift cars, landing doors, landing doorframes and surrounds, landing indicators and controls.
5. The extent of lift over runs top and bottom of the lift shaft. Over runs shall not be greater than those shown on the architectural drawings.
6. The maximum electrical current per phase and neutral to be carried by the lift supply cable.
7. The minimum size of circuit breaker that will carry peak loads without operating.
8. Termination position of the lift sub-mains.
9. Door frames, faceplates, car position and direction indicators, call buttons, etc.
10. Car superstructures and finishes.

Drawings shall be: –

1. Submitted in pdf format.
2. Prepared to comply with Australian Standards for Engineering Drawing Practice, AS1100 to AS1109 inclusive.
3. Drawn to the following scales – 1:1, 1:5, 1:10, 1:20 for components and 1:50, 1:100 for locations, except for wiring diagrams, which need not be to scale.
4. Dimensioned in S.I. units.
5. Prepared by competent draftsmen using CAD software, which can produce electronic files that can be viewed and plotted with the latest version of Auto Cad.
6. Amended as necessary and incorporated within the as-installed drawing set.
7. Thoroughly checked prior to submission as regards measurements, materials and details to ensure that they conform to the intent of the contract.
8. Complete in detail to show whether the equipment depicted complies with the contract and is suitable for its intended use and location.
9. Submitted in sufficient time to permit modifications to be made without delaying the works. Allow at least seven (7) working days for checking. All drawings shall be approved in writing before work is commenced.
10. Submitted in sufficient time for approval and for the Contractor to make arrangements for access requirements and any penetration or items of equipment to be built in.

SAMPLES

Samples shall be:

1. Submitted of all equipment/accessories whose appearance will be visible.
2. Approved before installation commences.
3. Held on site after approval and used as a standard for acceptance or rejection of subsequent production units. Samples will be returned on completion of the project.
4. Labelled to identify their intended use and relation to these documents, e.g. call button passenger lift etc.

Subject to approval, where an item of equipment is a standard, a copy of the manufacturer's catalogue or brochure may be accepted, provided that all dimensions and relevant information are shown in the catalogue or brochure.

QUALITY ASSURANCE & INSPECTIONS

Apply Quality Assurance as required by the contract. Implement a quality system, subject to external audit in accordance with AS/NZS ISO 9001.

Allow all assistance necessary for regular on-site inspections by the builder.

Allow to attend regular site, design and coordination meetings.

Provide regular monthly QA statements for the Builders PCG reports confirming all design is in accordance with the contract design, law, codes and authorities. Detail any non-conformances and rectification action.








WORKS FOR AND BY OTHER TRADES

The following works associated with the lift services installation shall be coordinated by the lift contractor and other trades.

BUILDING WORK

The principle contractor shall provide;

LIFT PITS

-  Dry pit designed to withstand reactions shown on workshop drawings.
-  Build in bond blocks/bolts/inserts.
-  Have overhead lift beams or eyes for lift shaft supplied for the builder to install
-  Have trimmer beams and screens.
-  Have barricades to door openings during construction.
-  Have penetrations filled in behind call stations and indicators in lift front walls to maintain fire rating of walls.
-  Be provided with shaft and pit lighting to statutory requirements.

LIFT SHAFTS

- ④ In order to install the lift(s) the lift shaft must respect dimensional tolerances and plumbness as specified on the approved layout drawings. Also the exact floor levels at each landing must be indicated nearby the entrance (e.g. by a 1,000 mm mark). Dimensional non-conformities in lift shaft are likely to require re-ordering of material or re-work and cause delays. They therefore potentially generate extra cost. We strongly emphasise the need for accurate lift shaft dimensions, tolerances and plumbness (+30 mm/- 0 mm). The shaft walls are to be concrete or filled with reinforced block work that is able to properly hold masonry fasteners. Blocks should be filled every 3 to 4 courses. The shaft construction must attenuate vibrations & sound traveling into building below 45dBA.
- ④ The lift shaft shall be weatherproof.
- ④ Build in lifting beams or eyes at the top of each lift shaft, Supply of beams or eyes and provision of safe working load sign for each beam or eye is part of the lift works.
- ④ Openings for doorframes, button boxes, and indicators.
- ④ Accurate datum points/grid lines for door frames.
- ④ Finishes up to door frames.
- ④ Chases for door frame sills, conduits.
- ④ Penetrations for all fixtures. 25mm diameter hole in the centre of fixture location as shown.
- ④ Make good doorframes and landing call stations and indicators after installation. All door frames must be protected, properly braced and fixed, including sills as part of the lift works.
- ④ Vent to outside (with fire damper where required to separate lift shaft from remainder of building, insect and weather protection) at top of shaft for each machine room less lift to avoid excess heat.
- ④ Penetrations for installation platform as shown.
- ④ 2 Recesses and 1 penetration for the controller panel on the top floor served as shown on the approved drawings.
- ④ Weatherproof top landing served for protection of controller panel.
- ④ Cutting & closing of walls in lift shaft.
- ④ Cover plate for machine beam penetrations – 2 hour fire rated lift shaft.
- ④ Cover plate/grouting for Installation platform penetrations – 2 hour fire rated lift shaft.
- ④ Grouting/making good finished front wall to landing finished frame.
- ④ Ventilation in top of shaft. Area to comply with local building regulations. (located to avoid equipment in shaft). The lift shaft shall be suitably ventilated. In the absence of relevant regulations or standards, it is recommended to provide ventilation openings at the top of the lift shaft, with a minimum 0.10sqm. The ambient temperature in the lift shaft shall be maintained between 0°C & +40°C.

SAFE ACCESS & STAIRWAYS

Safe access to landings is essential. Access should be possible by means of fixed stairways with fall prevention (e.g. temporary handrails) over the complete transportation / access route. Stairways and access routes should be illuminated. The use of ladders to gain access to either the site, storage facility or the lift shaft is not acceptable.

UNLOADING & STORAGE

In order to enable efficient material distribution it is important that the material can be unloaded from the delivery truck within a distance of 50 metres of the storage / unit location and have clear, rollable access from unloading area to storage area.

Onsite – Provide 30m², secure & weatherproof storage for City Lifts equipment and materials when delivered to site within 20 metres of lift shaft and located on lowest landing served, with clear and level access between unloading/ storage area and lift shaft.

The principle contractor is responsible for all traffic control at the site during equipment delivery.

ELECTRICAL SERVICES

Co-ordinate the following:

- ④ Location and rating of equipment and switchboards requiring an electrical supply.
- ④ Space available for termination of incoming cables on switchboards/control panels/equipment.
- ④ Discrimination and co-ordination of circuit protective devices.

The Electrical Services Sub-Contractor shall provide:

- ④ Prior to the commencement and during the entire installation of the lift, provide uninterrupted temporary power within 5m of the controller recess on the top floor served. This supply will cater for a maximum demand of 15 amps and be available in three phase 415 VAC and single phase 230 VAC. This supply will be used for erection, lighting, testing and operation of tools and hoisting equipment.
- ④ Prior to the commencement of installation, provide permanent power, located in the controller recess as shown, with a tail of 5 metres. If multiple lifts are being installed submains per lift are required.
- ④ Rating of mains protective device, to be greater than largest lift circuit breaker.
- ④ 24 hour lighting at the top floor landing of each lift for access to lift controls.
- ④ A telephone cable to each lift control panel with 5 m tails for connection of telephones in lift cars; connect cables from lift telephones.
- ④ Supply a card key reader to the lift supplier to build into each data entry station and into each car operating panel, to control access to individual floors via the lifts; the access system will have a high level interface to the lift controls.
- ④ Provide a CCTV camera and housing in each lift car, Connect to Cat 6 cabling in the screened traveling cabling. Connect other end of cable to CCTV network.

- ④ Space available for termination of incoming cables on switchboards/control panels/equipment.
- ④ Terminals for the connection of a signal indicating when the building is operating on the standby power supply.
- ④ Installation of access control equipment in each destination entry panel and within each car operating panel
- ④ Termination of telephone cables to lift control panels.

MECHANICAL SERVICES

Provide the following items for the Mechanical Services Sub-Contractor:

- ④ Low level interface from each lift control panel to the BMCS for monitoring of lift alarms.
- ④ Information on heat rejection of equipment to the Mechanical Contractor to enable sizing of cooling/ventilation plant.

FIRE PROTECTION SERVICES

Provide the following items for the Fire Services Sub-Contractor:

- ④ Access to the lift shafts for the installation of required fire protection and fire detection equipment.

The Fire Services Sub-Contractor shall provide the following items for the lift services:

- ④ Fire protection to authority requirements. This may include sprinklers and smoke detectors to lift shafts.
- ④ Fire detection and protection fitted in the lift shaft must be of a type that will not adversely affect the lift equipment or cause electrical hazards.

AVAILABILITY OF PHONE LINE

Two weeks prior to handover provide a dedicated analogue phone line, terminated at a final distribution point on the inside of the shaft at the top floor served within 3 metres of the controller panel. The availability of the phone-line is a very frequent cause for delays. We recommend taking special care in the timely availability of the telephone line since it is critical for receiving a safe to work certificate. In the event that the phone line is not available when required, the customer shall be liable for re-establishment costs should City Lifts have to leave and return back to site to finalise the project. The installation and on-going rental fees of the phone line shall be at the builder's/client's cost.

DESIGN CRITERIA & PERFORMANCE REQUIREMENTS

The Lift Services shall be designed, installed, tested and commissioned in accordance with the Design Criteria summarised in the following tables in order to satisfy the specified Performance Requirements for the project.

TECHNICAL SPECIFICATIONS

Lift	
Location	Designation
No of Stops	5
Service Classification	Passenger
Max. Passengers	21
Load Rating	1,600 kg
Speed	1.75 m/s
Travel	21.858 m
Lift Car Size	1,750 mm W x 1,950 mm D x 2,200 mm H
Lift Shaft Plan View Size	7,800 mm W x 2,275 mm D
Pit Depth	2,000 mm
Headroom	4,400 mm
Machine Location	Top of lift shaft
Compliance	AS1735, EN-81
Warranty	12 months DLP included.
Documentation	3 copies maintenance and operation manual
Lift Cabin	
Door Size	1,000 mm W x 2,100 mm H
Door Type	Two panel center opening
Door Material	Stainless steel, hairline finish
Door Protection	2D
Walls	Stainless steel, hairline finish
Car Floor Finish	30 mm recess with flooring by others
Ceiling / Lights	Stainless steel insert with 4 or 6 LED downlights with emergency battery backup
Car Operating Panel	One
Handrails	50 mm diameter stainless steel, adjacent to COP in accordance with AS1735.12
Skirting	50 mm recessed stainless steel.
Ventilation	Electromechanical forced & natural ventilation
Audible Indication	MP3 player
Landing Door	
Door Size	1,000 mm W x 2,100 mm H
Door Type	Two panel center opening
Door Material	Stainless steel, hairline finish
Frame Type	Box
Features	
BMS & Security Interface	Low level fault monitoring
CCTV Interface	Trailing cable for future camera
Safety	
UPS Automatic Rescue Device	Included

LIFT TECHNICAL DATA

Hoist Drive		Unit	
Manufacturer's Product Code			Torin Drive
Motor Rated Output		kWatt	20, 25 or 30
Design			Permanent Magnet Synchronous
Type			Gearless
Drive System			VVVF
Integrated Drive Controller			
STEP			AS 380
Levelling Accuracy		mm	3
Traffic Control Features			Full Collective
Door System			
Manufacturer's Product Code			ESHINE
Door Operator Motor Voltage		Volt	415
AC Motor Design			Synchronous
Speed Control			VVVF
Drive Type			Belt
Floor Finding/Levelling			
Car Position System			CEDES
Resolution		mm	1
Levelling and Final Stop			3
Displays			
STEP			TFT
Cabin size		mm	154 x 86
Landing size		mm	95 x 54
Pushbuttons			
STEP			EB960
Diameter		mm	36
Standby Energy Consumption			
Controller		watts	100
Drive system Inverter		watts	150
Landing displays		watts	20
Car displays		watts	20
Car buttons		watts	5
Landing buttons		watts	5
Car fan		watts	6
Power Supply			
Total harmonic distortion at lift switchboard		%	<3
Power factor full load up/down			0.9
Power factor empty up/down			0.9
Main drive inverter efficiency		%	95

LIFT CONSTRUCTION, CABIN & FIXTURES

The lift car construction, cabin interior and fixtures shall be of equal quality as shown;



CAR OPERATING
PANEL



DISPLAY



PUSH BUTTON



KEY SWITCH



LANDING OPERATING PANEL



HALL INDICATOR

LIFT EQUIPMENT

GUIDE RAILS

Lift car and counterweight guide rails shall be provided, erected plumb, and securely fastened to the lift shaft. Design and provision of the lift shaft shall be of adequate strength and properly positioned to withstand loads applied in conjunction with data provided by the lift contractor. The method of fixing the guide rails to the building shall allow for settling of the building and compression of columns.

Guide shoes shall be provided and mounted to the top and bottom of both the car and counterweight frame. Each guide shoe assembly shall be arranged to maintain constant contact on the rail surfaces.

BUFFERS

Buffers shall be of the oil filled type for lifts faster than 1 m/s, spring or other approved type for slower lifts. Oil filled buffers shall be sealed against the ingress of dirt and grit.

ACCESS LADDERS

Provide the pit access ladders.

GEARLESS LIFT MACHINES

shall incorporate a slow speed motor, having its rotor, driving sheave and brake drum assembled on a common shaft. Power for the machines shall be obtained from solid state variable with variable voltage variable frequency (VVVF) converters.

The control system shall be fully electronic and shall accelerate and decelerate the motor to a predetermined pattern smoothly throughout the speed range. The accuracy of control shall be achieved by a proportional error feed – back system.

The driving sheave shall have accurately machined grooves to suit the lifting ropes. The driving mechanism shall operate under maximum loading without overheating or vibration. The bearings shall not leak oil and shall be dust – tight, self-lubricated and, where necessary, fitted with oil level indicators.

The brakes shall be fitted with adjustable and renewable brake shoes. The brake shall operate automatically upon operation of any of the electrical safety devices or upon failure of the main electrical supply. The brakes shall stop the lift in a smooth manner and sustain the lift when loaded to its rated capacity.

Provision shall be made for the manual raising or lowering of the cars. Provide a brake – lifting device to release the brake to effect the manual lifting or lowering of the lift car. This device shall be so designed that it cannot keep the brake lifted after the human element has been removed.

The safety gear shall be capable of repeated operation without adjustment and shall operate without damage to or distortion of the guide rails.

LIFT CARS

Tenders shall include all work associated with each lift car including the car superstructure. The superstructure shall be of solid construction and modern styling with wear resistant finishes.

The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.

Each lift car shall:-

- ⦿ Comply with accessibility requirements of clause E3.6 of the NCC and sections of AS 1735.12
- ⦿ A non-slip threshold plate mounted flush with finished floor level.
- ⦿ Car control panel located in the side wall of the car. It shall be flush mounted with concealed hinges, featuring:-
 - ⦿ Buttons with braille and tactile markings.
 - ⦿ Key pad for lifts with destination control; press buttons for each landing with signal light for other lifts.
 - ⦿ Door re-open button.
 - ⦿ Door close button.
 - ⦿ Car position and direction indicators at each landing at least 1800mm above floor level, and voice annunciation at all levels.
 - ⦿ Restricted fire service key switch.
 - ⦿ Have an exclusive control key switch including a "park" position.
 - ⦿ Alarm button and associated equipment.
 - ⦿ Switches for light and fan.
 - ⦿ Card key reader (if required).
 - ⦿ A hands free telephone with operating instructions engraved in the car control panel. Wire from the telephone to the lift control panel and connect to the telephone cable, provided as part of the electrical works, via an automatic dialling unit, which will automatically connect a passenger pushing the alarm button to the lift company call centre.

All relevant notices shall be engraved in a removable section of faceplate above the car operating panel.

- ⦿ Specifying the maximum load to be carried in kilograms and persons.
- ⦿ The names of authorised lift maintenance contractors.
- ⦿ A ventilation fan mounted in the car roof.

Provide recesses in the wall of each car suitable for the hanging of a loose padded tarpaulin covering to protect the interior of the car if it is on goods service. Provide loose 1 piece tarpaulin covers to suit the lifts.

The covers shall be sewn and reinforced around the edges and shaped to suit the lift car. The covers shall be designed to protect the inside car finishes from damage when being used to carry goods, and shall have clips to fit the recesses specified above.

CAR & LANDING DOORS

Car doors shall be of the automatic type.

Car and landing doors shall be hairline stainless steel.

Door suspension and tracks shall be arranged and mounted to allow adjustment to ensure that doors are in correct alignment.

The door operating mechanism shall be capable of operating the doors at the maximum speed permitted by the regulations without undue noise, vibration or shock.

The door operating mechanism for each car shall be controlled by a 2D electronic detection device that will detect a 75 mm diameter rod across the door opening between 50 mm and 1,550 mm above the car sill as well as objects approaching the door. While the doors are closing any attempt by an intending passenger to enter the car shall result in the doors reversing for the passenger to enter. Provide a sight guard on each landing door to conceal the transmitters/receivers and to minimise the gap between the car and landing doors.

The doors shall commence to close after a passenger has passed through the doorway and doorway has remained clear for a further adjustable period – set for 0.5 seconds.

LANDING DOOR SURROUNDS

The surrounds shall be fabricated from hairline stainless steel.

Set the frames plumb and true in the wall opening and securely fix.

The landing door frames of each lift shall each be provided with a mechanic's maintenance door unlocking device. Provide a set of the associated keys in a box.

LANDING CONTROLS

ILLUMINATED INDICATORS AND GONGS

Lift position indicators shall be of the colour LCD type designed to clearly indicate to waiting people, the lift's position and its direction of travel.

CALL BUTTONS

The call buttons shall comprise an "UP" and a "DOWN" button, (except on terminals), which shall automatically illuminate when a call is registered.

Each faceplate shall be engraved: –

"IF THERE IS A FIRE DO NOT USE LIFT"

or similar wording to statutory requirements.

FIRE RESISTANCE LEVEL

Landing call and/or indicator panels shall be backed by construction having a Fire Resistance Level as required by NCC.

LEVELLING

Provide the lift machines with accurate levelling equipment, which shall level the lift automatically within the specified tolerance under all load conditions. The levelling equipment shall keep the lift at floor level as it loads and unloads.

CONTROLS

POWER AND OPERATIONAL CONTROLS

The lift power control system shall be a digital, solid state based control system. The power control system shall provide smooth, accurate speed regulation and efficient operation. The power control system shall interface with the microcomputer lift logic providing closed loop position control.

Solid state load/torque balancing circuitry shall be incorporated to automatically monitor car load prior to start and adjust the lift motor torque to assure smooth car start-up.

The power control shall be fully factory pre-set, minimising the need for field adjustment. Computer inputs shall tailor the power control to the specific elevator design parameters. Provision shall be made for minor field adjustment. Such adjustments shall generally be non-interacting. That is, adjustment of one characteristic shall not necessarily affect the adjustment of another.

The controls shall be electronic data processing based systems incorporating car weighing and providing anticipation of calls, flexible allocation of cars and designed to suit conditions and traffic patterns.

Controls shall be of the solid state programmable logic, electronic type with inherent fault diagnostic and fault indicating characteristics. Tenderers shall submit full details of the proposed control system.

Collective control operation shall be as follows;

Pressure upon one or more car buttons shall send the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed, provided the hoistway door interlock and car door switch circuits are completed. During this operation, the car shall also answer calls from the landings which are in the prevailing direction of travel. Each landing call shall be canceled when answered.

Pressure upon a hall button at a floor above the car location shall cause the car to start up and answer any up calls as they are reached by the car irrespective of the sequence the buttons have been pressed. The car shall not stop at floors where down buttons only had been pressed. If no further car or up hall calls are registered, the car shall reverse its direction preference to response to car calls or down hall calls.

The car shall start down to answer calls below the car and shall not stop where only up calls are registered. When traveling up, the car shall reverse at the highest call and proceed to answer calls below it. When traveling down, the car shall reverse at the lowest call and answer calls above it.

Should both an up and a down calls be registered at an intermediate landing, only the call responding to the direction in which the car is traveling shall be canceled upon the stopping of the car at the landing. Terminal limit switches shall be provided in the hoistway designed to automatically stop the car at or near the closest terminal landing.

Provide all necessary equipment with the lift controls to interface with other building control systems that will include: –

- ④ A card key access system (provided as part of the electrical works) to restrict out of hours access to individual floors via the lifts. The access system shall have a high level (data) interface to the lift controls. The access control; system also requires the lift controls to report the destination selected by each passenger.
- ④ A building automation system (provided as part of the mechanical works). Lift controls shall indicate by a high level (data) interface that the lift has a fault or has been stopped by the operation of a safety device.

The installers of the respective control systems will wire to a point adjacent to lift control panel for the above controls. Extend the wiring and connect to lift equipment and to the reader in the lift car.

Operation of the "Exclusive service" switch in any lift shall cause that lift to answer only calls registered in the car.

Duplex control operation shall be as follows;

Individual Car Control – Individual car controllers shall be solid state with high efficiency processors and have closed loop velocity and positioning. Individual car controllers will incorporate processors in a distributed scheme to provide maximum flexibility and computing power. A pre-selected controller shall be assigned as the system control manager in addition to controlling its individual car. System redundancy in the group system shall be accomplished through identical capabilities housed in one or more of the other individual car controllers.

Hall pushbutton risers shall be attached to both the main group controller as well as the back up controller. In the event that the main group controller can't perform its duties, the system shall automatically switch to the backup car controller. Communication between individual car controllers shall be accomplished through a serial link as well as concurrent communication through a secondary serial link.

For each individual car controller, provide a serial card rack and main CPU board containing a non-erasable EPROM and operating system firmware. Variable field parameters and adjustments shall be contained in a non-volatile memory module. Serial ports shall be provided for connection to monitoring devices / diagnostic tools.

Each lift machine shall be provided with a tachometer in order to provide accurate feedback to the controller as to car position.

All individual lift control adjustment parameters shall be stored in non-volatile memory within the computer control system.

At each landing, a vane shall be installed to provide the floor zone detection. The vane shall also serve as a method for referencing absolute building points for the controller.

In the event of power loss, the lift shall emergency brake to a stop. When normal power is restored, the lift shall automatically restart and level to the nearest floor, providing it is safe to do so.

Group control operation shall be as follows;

The microcomputer system control manager shall direct the cars to serve traffic demands established by registered car and hall calls as well as load weighing data. The group controller shall automatically assign calls and dispatch cars to provide optimum overall elevator service. The group control shall automatically sense changing elevator demand conditions and continuously adjust elevator operation to be responsive to such demand.

The system control manager shall monitor all the operational features described for the individual car controllers and shall also connect to field diagnostic/service tools.

The operation of each lift, from within the car, shall be such that momentary pressure on one or more car pushbuttons shall send that car to the designated landing(s) in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons were pressed, provided that the landing door interlock and car door switch circuits are completed. During the car response to these car calls, the cars shall also answer hall calls registered at individual landings in accordance with demand assignments received from the group controller.

The flight time to travel a nominal floor distance shall be preset. Door operating speeds shall be based upon center opening doors.

Load weighing shall be accomplished by feedback an inductive proximity sensor under the platform measurement system.

The operation of the lifts specified shall be accomplished utilising microprocessor computer logic group software. The group lift control program shall be contained in a non-volatile, programmable, read-only memory. Group control shall be constructed such that future alterations in lift group operation may readily be accomplished by altering the read-only memory.

The system shall monitor group lift traffic conditions and cause the selection of the appropriate operating mode based upon Specific Traffic Pattern Intensity.

The following operating modes shall be provided:

- a. Light Traffic Pattern Mode
- b. Normal (Balanced) Traffic Pattern Mode

Provide a system which monitors for unintended upward movement of the lift system. In the event unintended upward movement occurs the system shall engage a braking system to stop a car with up to 120% of rated capacity. The main car brake, rope brakes and sheave wedges are not acceptable alternatives.

FIREMAN'S SERVICE

Provide fireman's service controls in accordance with the requirements of the regulatory authorities. Operation of "fire service" controls shall be independent of the card key access system. Provide fire recall switches in the landing faceplates for the lifts at the main entry level.

PERFORMANCE

The lift/s shall meet or exceed the performance values set out below;

Life Cycle	Unit	Guarantee
Landing and Car Door Systems	years	25
Buttons	years	20
Car and Landing Displays	years	20
Motor and Drive System	years	25
Controller	years	25
Maximum Starts per Hour	number	240
Quality of Ride		
Max. Horizontal Vibration Frequency Range - X Axis	Hz	1-10
Max. Horizontal Vibration Frequency Range - Y Axis	Hz	1-10
Jerk	m/S ³	<1.2
Levelling Tolerance - full load	mm	+/- 5
Levelling Tolerance - no load	mm	+/- 5
Acoustic		
<i>Inside Car (Fan Off)</i>		
Car Running at Contract Speed	dB(A)	60
Car During Acceleration or Deceleration	dB(A)	60
Car During Levelling with Doors Opening	dB(A)	60
Adjacent Car Passing Stationary Car	dB(A)	55
Car Stationary, Doors Closed (Fan Off)		40
Car Stationary, Doors Closed (Fan On)	dB(A)	50
<i>In Lift Lobby</i>		
Car Passing at Contract Speed	dB(A)	LpAeq 50, one metre from door
Door Opening or Closing	dB(A)	LAm _{ax} 60, one metre from door
Inside Liftwell	dB(A)	60
In Adjacent Room	dB(A)	55
<i>Structure Borne Noise</i>		
Octave (Hz)		L_{max}
63	dB(A)	90
125	dB(A)	90
250	dB(A)	85
500	dB(A)	85
Other		
Fire Rating of Landing Door	hour	1
Levelling and Final Stop	mm	1
Call Out Response Time		
Person Trapped in Car Response	minutes	25
Lift Shutdown on Fault Response	minutes	40

LIFT MONITORING

Provide a performance monitoring system for all lifts, including a computer with monitor and at least 500GB hard disk in the security office. Provide a laser printer connected to the lift computer for printing faults and traffic analysis on A4 paper at 8 pages per minute or faster.

It shall be possible to call up the following displays on the monitor using the keyboard:

Supervisory Display (to show all lifts at the same time)

The following shall be displayed: –

- ④ Position of each Lift.
- ④ Direction of travel.
- ④ Car Calls.
- ④ Landing Calls.
- ④ Status of Doors.
- ④ Lift on Security.
- ④ Car Out of Service.

From this display it shall be possible to control the following security functions for each lift (after entering the appropriate password):

- ④ Security for Specific Floor: on/off.
- ④ Independent Service: on/off.
- ④ Express Priority to Specific Floor: on/off.
- ④ Priority Type: emergency/VIP.
- ④ Send Specific Lift: on/send any available lift.

Traffic Analysis Display (to show one group at a time)

Display a summary table of recorded results over 5 minute to 60 minute intervals for all or any nominated landing or group of landings: –

- ④ Number of Landing Calls Registered.
- ④ Average Landing Call Waiting Time.
- ④ Number of Landing Calls for Each Lift.
- ④ Longest Landing Call Waiting Time.
- ④ Percentage of Time Lift Out of Service.
- ④ Number of Trips per Car that Load Exceeds that at which Landing Calls are Bypassed.

Faults

Display a table of faults on the lifts, month by month for 12 months showing lift number, date, time and fault.

Provide all necessary equipment with the lift monitoring computer to interface with the building monitoring and control system (BMCS) via a communication link. In the event of a fault, the lift monitoring computer shall send to the BMCS the number of the faulty lift, its location and whether passengers are trapped.

It shall be possible to amend message displays in the cars using the monitoring computer.

PAINTING, FINISHING & SIGNS

Painting shall comply with AS 2311 sections 3, 6 and 7: Guide to painting of buildings.

Volatile Organic Compounds (VOCs) in paint shall be in accordance with The Australian Environmental Labelling Association, Inc. Standard No: AELA 23-2005 'Australian Voluntary Environmental Labelling Standard Architectural and Protective Coatings'.

The finish of the various parts of the installation shall be as detailed in the respective clauses of the specification or otherwise as follows.

All steel surfaces shall be effectively rust - proofed in accordance with AS 2312 sections 5, 8 and 10 of: Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.

Thoroughly clean down all surfaces, free of grit, building dust, grease and foreign matter. Include the removal of all cement, plaster and other foreign matter adhering to steelworks, plant equipment and fittings.

Give particular attention to running surfaces to ensure smooth, quiet operation.

Ensure that all surrounding and adjacent areas are suitably protected whilst painting is in progress and pay all costs incurred in making good where over spray has occurred.

Painting shall be carried out to the suppliers' specification. Paintwork shall have a high standard finish with an even colour and smooth surface, without imperfections or blemishes. Experienced painting tradesmen shall carry out all paint finishing.

Give equipment, painted before delivery to site, one coat of rust inhibitor primer and spray paint with high quality enamel. Equipment marked during delivery storage or installation shall be touched up to approval in a matching colour prior to practical completion.

Give equipment, requiring painting on site, one coat of rust inhibitor primer and two coats of high quality enamel.

Any timber installed in the lift shaft, including the external surfaces of timber on lift cars, shall be dressed and painted with an approved fire retardant compound.

Finish all equipment and building structure visible between the car and landing doors when the car is at a landing in matt black enamel. This applies to header plates, locks, lock arms, door closers, toe guard, inside face of landing doors, outside face of car doors, passenger detection device, front of lift car, power door operator, well flushing and screens.

COMMISSIONING & TESTING

GENERAL

Subject all lift systems to a commissioning and testing procedure before they are put into service.



Provide all test instruments, other testing facilities and skilled and unskilled labour required to verify system and equipment performance and to complete all checklist records. Include cost in tender price. Any work, which does not comply with the specification, shall be made good.

Give at least 2 weeks' notice prior to the start of the commissioning of any particular system, and submit a programme of testing and commissioning procedures for that system. Modify the programme as required.

CHECKLIST

Prepare a detailed and comprehensive checklist prior to commissioning and testing. Two months prior to the start of commissioning submit the proposed checklist for approval.

The purpose of the checklist is to:

-  Ensure that all items that should be checked are checked.
-  Produce a permanent record of the commissioning checks carried out.

Accordingly the checklist must be built up from information contained in this specification, from suppliers, manufacturers' installation and commissioning data and from experience in commissioning similar equipment and systems.

The detail of the checklist must be such that it can be completed with a reading or a tick, which means that every device must be listed e.g. Load – weigher set 70% – OK

The check list for rope suspended lifts shall cover at least the following:–

Brakes.	Load notice.
Drive machine.	Landing buttons and switches.
Safety switches and devices.	Car buttons and switches.
Equipment labels.	Indicators.
Well lights.	Floor levels.
Overruns.	Timers.
Ropes.	Emergency light.
Trailing cables.	Car telephone.
Clearances in shaft.	Control system.
Well access devices.	Exclusive service.
Door clearance.	Fire service
Landing doors clean and free from site damage.	Interface with BMCS
Fire doors and frames tagged.	Interface with security system
Power door operator.	Re – levelling
Door locks.	Load weigher settings
Limit switches.	Protective blankets.
Floor location devices.	Car dimensions.
Counterweight balance.	Car finishes.
Guide rollers/shoes.	Noise in lift car and at landing closest to lift motor.
Static balance.	Car speed.
Speed governor.	Safety gear.

PROCEDURE

Commissioning and testing procedures shall generally include:

- ④ Visual check of all work for completeness, and against diagrams of all wiring.
- ④ Check that all work complies with the relevant Regulations.
- ④ Check that all equipment is safe to operate, and that overloads, safety devices and interlocks are all in working order.
- ④ Verification of performance under site conditions, under load and simulated "worst case" condition.
- ④ Test continuity and unique identification of all conductors in all cables.
- ④ Check main earth connection and test all earth continuity connections.
- ④ Check polarity and phase rotation of supply at all outlets.
- ④ Check all work for completeness and proper working order.
- ④ Test run all equipment for at least 24 hours.
- ④ Check calibration and operation of each device.
- ④ Final tests shall be conducted in the presence of the consultant.

AUTHORITIES' INSPECTIONS, FEES & CERTIFICATION

After the commissioning tests have been concluded successfully, arrange for the inspection of the equipment to Regulatory Authority requirements and issuing of the relevant certificates.

Carry out demonstrations of all systems as required by the authorities. Also allow for all pre-inspection testing to ensure that all systems are ready for the authorities' inspection.

Lodge all notices and pay all fees required by the Controlling Authorities, including lift registration fees.

The lift contractor shall make a final check of each lift operation with the owner or owner's representative present prior to turning each lift over for use. The lift contractor shall determine that control systems and operating devices are functioning properly.

Hand over 3 sets of keys to operate each type of key-operated switch and lock associated with the lifts. Any keys that over-ride the security system shall be of the restricted broach type that cannot be copied without written authority from the building owner.

Allow in the Tender Price to pay for any necessary and chargeable testing work.

AS-INSTALLED DRAWINGS & MANUALS

GENERAL

Provide as-installed drawings and manuals on completion of the works and prior to the issue of the Certificate of Practical Completion.

Submit preliminary copies of the documents for checking.

After approval provide three (3) prints of the drawings full size and one (1) print reduced to A3, three (3) hard copies of the manual and AutoCAD and PDF files for the drawings on compact disc.

DRAWINGS

The drawings shall be carried out by competent draftsmen.

Workshop drawings prepared and submitted prior to installation shall be amended to show all variations and will be accepted as as-installed drawings.

The drawings shall also show the following:

- ④ The as-installed location of all equipment.
- ④ The arrangement of control panels.
- ④ Wiring diagrams.
- ④ The arrangement of switchboards.

MANUALS

Provide 3 hard copies, and one PDF copy on CD-ROM of each installation manual. The manual shall include a full description of the installation and functioning of the systems and instructions for efficient operation and maintenance. The manual shall be bound in a folder with printed label on the front in the following format:-

INSTALLATION MANUAL FOR LIFT SERVICES

Lift Contractor

(as appropriate)

The words "Lift Manual" and the job name shall be printed along the spine of the folder.

The manuals shall incorporate the following information grouped into sections.

- ④ Index.
- ④ Operating instruction for all equipment; include procedures in case of malfunction or civil emergency.
- ④ Manufacturers' brochure for all equipment.
- ④ Schedule of Recommended Maintenance by the building managers.
- ④ Schedule of Recommended Maintenance by a Maintenance Contractor (who, for the first 12 months, is the installer).
- ④ All relevant information to assist the Proprietor in carrying out the maintenance, additions and/or alterations to the installation.
- ④ Completed checklist (refer Commissioning & Testing).

Where manufacturers' drawings are provided with the manual, they shall be folded and included within the manual, or alternatively bound separately and cross-referenced in the manual.

WARRANTY & MAINTENANCE

OPERATIONAL WARRANTY MAINTENANCE

(12 MONTHS AFTER PRACTICAL COMPLETION OF HEAD CONTRACT)

The lift contractor guarantees the materials and workmanship of the apparatus furnished under these specifications. The lift contractor shall make good any defects which may develop within one (1) year from the date of practical completion of the head contract, not due to ordinary wear and tear, vandalism, improper or insufficient maintenance by others, abuse, misuse, neglect or any other cause beyond the control of the lift contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

This service shall not be subcontracted but shall be performed by the lift contractor.

During the warranty maintenance period provide qualified and experienced personnel to perform the maintenance required for safe and reliable operation, including the following:

- ④ Make regular service visits at the required intervals and at times agreed with the building staff, and carry out regular maintenance procedures, including running adjustments, lubrication and the like.
- ④ Promptly attend stoppages or unsatisfactory operation of equipment at any time of the day or night, and restore the installation to proper working order. Before the start of the maintenance period, supply the contact telephone numbers of the persons to be called.
- ④ Make good faults or damage caused by defects in the installation, and replace defective parts or parts showing signs of undue wear.
- ④ Supply the necessary maintenance materials including lubricants and cleaning materials.
- ④ Leave the areas and equipment in and on which maintenance work was performed clean and tidy after each visit.
- ④ Provide a record of each visit including the date and time, work carried out, name of the service operator and any relevant, information in one of the following forms:
 - a computer record;
 - a log book with pages set up for operational maintenance records, neatly bound in durable vinyl or similar hard covers, permanently labelled with the project name and date of issue.
- ④ At the end of the warranty maintenance period, make a service visit. Test the safety and protective devices, demonstrate the satisfactory operation of lift installation, and certify in writing that it is in satisfactory working order, and is operating correctly.

COMPREHENSIVE MAINTENANCE

Include as a separate item in the tender the annual cost, as at the date of closing of tenders, for maintaining each lift in a proper and safe operating condition under a 5, 10 or 20 year comprehensive maintenance contract commencing after expiry of the operational warranty maintenance period and in accordance with the following:

- ④ Regular inspections, maintenance, adjustments and lubrication of each lift by a competent mechanic and assistant, during normal working hours at a mutually agreed upon time.
- ④ Replacement and/or repair all components of the installation necessitated by reason of normal wear and tear, with the exception of the actual car superstructure, floor coverings, landing door surrounds and sills, door panels and supply mains to the lift switchboard.
- ④ Provide all lubricants, compounds and cotton waste.
- ④ Promptly answer all calls necessitated by stoppages, or unsatisfactory operation of the equipment, during and after normal working hour periods, and restore the equipment to proper working order.
- ④ Carry out major replacement or repair work during normal working hours. If otherwise directed, claims will be received for additional labour costs based on the difference between afterhours and normal hour rates for the periods worked.