

THE WILLCOX APARTMENTS 117 PROSPECT ROAD, PROSPECT

Project No: LCE13523

Vertical Transportation Services Specification

For Construction

Revision A

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ENGINEERS**

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CONTENTS

1	GENERAL	1
1.1	CROSS REFERENCES	1
1.2	PROJECT DETAILS	1
1.3	DEFINITION OF TERMS	1
1.4	SCOPE	1
1.5	BUILDING SUMMARY	4
1.6	ASSOCIATED WORKS	4
1.7	STANDARDS	6
2	CONTRACT SUBMISSIONS	7
2.1	TENDER SUBMISSIONS	7
2.2	PRE-CONSTRUCTION SUBMISSIONS	7
2.3	CONSTRUCTION SUBMISSIONS	9
3	GENERAL INSTALLATION REQUIREMENTS	12
3.1	PRE-CONSTRUCTION REQUIREMENTS	12
3.2	MATERIALS EQUIPMENT AND WORKMANSHIP	12
3.3	ELECTRICAL INTERFERENCE	12
3.4	BALANCING AND PHASE ROTATION	13
4	COMMERCIAL PASSENGER LIFT EQUIPMENT	14
4.1	GENERAL	14
4.2	PERFORMANCE REQUIREMENTS	14
4.3	INSTALLATION SCHEDULES	14
4.4	ENTRY SUMMARY	16
4.5	CONTROLS GENERAL	16
6	ELECTRICAL WORKS	19
6.1	GENERAL	19
6.2	REGULATIONS	19
6.3	EXTENT OF ELECTRICAL SERVICES	19
6.4	WIRING SYSTEMS AND SWITCHGEAR	20
7	TESTING AND COMMISSIONING	22
7.1	PRE-COMMISSIONING PROCEDURE	22
7.2	COMMISSIONING	22
8	MAINTENANCE	24
8.1	SCOPE	24
8.2	MONTHLY MAINTENANCE	24
8.3	BI-ANNUAL MAINTENANCE	25
	APPENDIX A – TECHNICAL DATA SCHEDULE	26
	APPENDIX B – TENDER PRICE SCHEDULE	28
	APPENDIX C - SCHEDULE OF PERSONNEL	29

1 GENERAL

1.1 CROSS REFERENCES

All work covered within this specification shall be read in conjunction with the following trade packages and contracts. Should any discrepancy occur between the references the larger/greater shall be assumed and referred to the Engineer prior to proceeding with any works.

- Preliminaries and General Contract Conditions
- Architectural Documentation
- Building Services Documentation
- Structural and Civil Documentation
- Acoustic Consultant

1.2 PROJECT DETAILS

The works involve the installation of one (1) machine room-less (MRL), 17 passenger/1275kg (nom.), 1.0 m/s speed, single entry passenger lift. The lift shall serve basement, ground and levels 1 to 4.

1.3 DEFINITION OF TERMS

Proprietor	- Client or end user of the proposed building
Head/Building Contractor	- Building Contractor appointed to carry out the construction of the building.
Contractor	- Installer undertaking the works.
Works	- As described within this specification
Provide	- Supply, install, commission and place into service
Local Power Authority	- SA Power Networks
Local Water Authority	- SA Water
Local Fire Authority	- South Australian Metropolitan Fire Services (SAMFS)
Equal Approved	- Alternative product/method of installation which is presented to the consulting engineer and written approval is received.

1.4 SCOPE

1.4.1 GENERAL REQUIREMENTS

The work covered by this specification includes the following:

- Full responsibility for the execution of the complete installation in accordance with this Performance Specification and related authority requirements.

- The whole of the works shall comply with all relevant Regulations and to all Local Authority requirements. The cost of any materials or equipment required to meet such regulations and requirements shall be included in the Tender whether specifically indicated on the drawings or specification or not.
- Compliance with all relevant Occupational Health, Safety and Welfare legislation and best practice including any site specific requirements or regulations such as attendance at site inductions and adherence to the procedures covered in such inductions.
- Design Responsibility: The Contractor shall be responsible for detailed design of the Vertical Transportation installation in accordance with the performance requirements set out herein and in accordance with the details indicated on the architectural drawings.
 - Detailed design, manufacture, supply installation, testing, commissioning and maintenance service and warranty for the stipulated period of the new Vertical Transportation services installation described in this specification.
 - The planning, scheduling, procurement of components and installation to meet the programme, coordination and liaison with the head contractor.
 - Provide all manufactured items, materials, on and offsite storage, labour, cartage, tools, plant, appliances, and fixings necessary for the proper execution of the works, together with all minor and incidental work.

1.4.2 DESCRIPTION OF THE INSTALLATION

The following systems and services shall generally be included.

- One (1), machine-room-less (MRL) type, 17 Passenger / 1275 kg (nom.), 1400W x 2100D clear, 1.0m/s speed (min.), single entry passenger lift.
- KONE, Otis or Schindler manufacture, installation and service
- Lift installation in accordance with regulatory and listed Standards and regulations, including EN 81.20.
- Lift equipment complete with all machinery, structural steel support beams and roping, governors, rope guards, brake release and winding devices.
- Landing equipment including landing frames, sills and sill supports, lift well flushing, landing doors, door support and locks, door closers, directional indicators and landing call buttons. Allow for sill to bridge gap with adjacent concrete flooring.
- Lift well equipment including guide rails and fixings, counterweights and guards, guide shoes, pit access, screens to trailing cables and counterweights, ropes and fittings, buffers and supports, access ladders and any other ancillary items required to complete the installation.
- Lift cars and associated equipment including platforms, car frames, safety gear, car enclosures, ventilation systems, doors, hangers and tracks, sills, operating panels and position indicators.
- Electrical and communications services including, switchgear and controls, wiring systems, conduits and cable enclosures, trailing cables, motor isolating switches, emergency lighting to lift cars, lift well lighting, alarm bell system and lift car communication facilities.

- Controls associated with each lift installation including supervisory control systems, speed controls, lift controllers, levelling and floor finding systems, pit stop switches, fire service recall switches and power safety cut-off switches.
- Installation shall be compliant to AS1170, to ensure the lift installation is seismically restrained to comply with the most National Construction Code V1.
- Automatic battery back-up for emergency release to the nearest level and door opening operation, to all Lifts.
- Lift car internal finishes as scheduled.
- Provision of proprietary dual-GSM sim for the lift as the primary and secondary communications device. Vertical transportation contractor shall be responsible for all aspects of the communications device installation including but not limited to the following:
 - Individual Telstra and Optus network connectivity
 - Battery backup
 - Signal strength optimisation including booster (as required)
- Installation of card readers (supplied by Access Control System Trade) within the lift car and installation of associated trailing cable in lift shaft terminating at associated lift control panel.
- One (1) set of removable protective blankets for Head Contractor construction and post construction good lift requirements.
- Provision to make good of all lifts finishes as a result's of Head Contractor's use throughout construction.
- Permanent guards and handrails required by Department of Administrative and Information Services – Workplace Services and AS 1735.
- Supply of temporary full height and lockable guards as required during the installation phase.
- Noise and vibration control associated with lift installation.
- Testing and commissioning of lift installation.
- 12-months registration of lift in the name of the Proprietor.
- Comprehensive maintenance and servicing, warranty defects liability of 12 months from date of practical completion of lift installation.
- Installation (workshop and as-installed) drawings and operating/maintenance manuals.

1.4.3 VARIATIONS TO THE SCOPE

Instructions may be issued throughout the project which may alter the scope of works. Any aspects of any such works which are not specifically mentioned in any instruction are to comply with this specification.

Any claims for any additional costs or credits for any such variations must be submitted with a complete breakdown of costs including quantities and rates for all labour, materials and equipment. Variation Claims submitted without breakdowns will be rejected.

1.4.4 SUBSTITUTIONS TO THE SCOPE

Where a substitution to the specification is proposed, the contractor shall submit each substitution, incorporating technical details and a cost breakdown, to the head contractor. The substitution shall be reviewed by the consulting engineer and the client for consideration. Unless approved by the consulting engineer and the client, the substitution will not be acceptable as an equal or approved approach to the specification.

1.5 BUILDING SUMMARY

FLOOR	HEIGHT	AREA TYPE	ENTRANCE LEVEL
Basement	3000 mm	Carpark	Yes – 60% bias
Ground	4000 mm	Residential Entry Retail/Office	Yes – 40% bias No
L1 – L3	3200 mm	Apartments	No
L4	-	Apartments	No
Total	16,600 mm		

1.6 ASSOCIATED WORKS

1.6.1 GENERAL

The following works related to the Vertical Transportation Services installation shall be carried out under other trade packages at the direction of the head contractor unless otherwise indicated.

Coordinate all cable locations, runs / routes, terminal strip locations and ensure that information is provided to other trades to facilitate cabling and termination.

Provide any additional work required for the completion and full operation of the Vertical Transportation Services installation.

1.6.2 BUILDING TRADES

- Construction of fire rated and waterproof lift shaft, including a 0/+36mm tolerance.
- Provision of formed penetrations to the shaft structure to accommodate lift equipment, landing fixtures, conduits and shaft ventilation. Vertical Transportation trade to provide dimensioned shop drawings for all penetrations. Building trade shall provide and install louvres and fire dampers where required.
- Clear open space in front of the landing entrances at the ground floor (unless where otherwise agreed) to accept installation and manoeuvring of guide rails, entrances etc. All remaining floors to incorporate provision for clear landing openings for landing, fixture and lift installation.

- Supply & Installation of Lifting beam, eye(s) and the like. Vertical Transportation contractor shall coordinate location and final loadings of the proposed Lifting beam, eye(s). Vertical transportation contractor must define where liftings beams/eyes are required in each lift shaft/room.
- Payment of all costs for power consumed during installation.
- Supply and fit lift car floor covering. Vertical Transportation supplier to allow for the floor build up to suit the provided covering by other.
- Allowance for safe storage area for all lift equipment on the ground level. Coordinate exact location with building trade prior to any site set-up.
- Installation of temporary full height and lockable guards as required during the installation phase (supply by VT contractor).

1.6.3 STRUCTURAL ENGINEER

- Engineering and approval for the allowance of new lifting beams/eyes to suit the proposed new lift installations.

1.6.4 ELECTRICAL SERVICES TRADE

- The Electrical Sub-Contractor shall provide a dedicated fire rated electrical power sub-main cabling and terminals, with a minimum earth conductor cable size of 10mm² (or greater where shown on the electrical services drawings), adjacent lift control equipment. Cabling shall reticulate into the lift shaft (at the top landing, complete with 3 m slack). Electrical Services Trade shall coordinate installation with Vertical Transportation Trade. Final termination to lift control equipment by Vertical Transportation Trade. Where required, the Vertical Transportation Contractor shall allow to reduce the sub-main cable size to suit termination to the lift controller.

1.6.5 ACCESS CONTROL TRADE

- Access Control trade shall reticulate cabling into the lift shaft, at the top landing, adjacent lift control equipment (complete with 3 m slack).
- Final termination of incoming cabling to Lift Controller by Vertical Transportation Trade.
- Access Control trade shall provide card readers to the Vertical Transportation trade to be installed to the lift car.
- Vertical Transportation trade shall install and terminate cabling from lift controller to the card reader, within the lift trailing flex, including the installation of the card reader to the lift.

1.6.6 MECHANICAL SERVICES TRADE

- Provision and installation of weatherproof louvres at the top of the lift overrun for lift shaft air relief. Final location of louvres to be coordinated with Vertical Transportation Trade.

- Provision and installation of fire dampers at louvres where louvres are located within the building. Final location of dampers to be coordinated with Vertical Transportation Trade.

1.7 STANDARDS

General

Comply in all respects with the requirements of the current standards applicable to the works in respect to equipment, material, workmanship and installation techniques.

Comply with the following standards and regulations:

- National Construction Code, V1
- Australian Standard (SAA Lift Code) (the following as a minimum):
 - EN81 SET (including part 20)
 - AS 1735.1
 - AS 1735.2
 - AS 1735.12
 - AS/NZS 3000
- Local Power Authority Regulations
- Occupational Health, Welfare and Safety Regulations
- Federal, State and Local Government Building Acts and Regulations

2 CONTRACT SUBMISSIONS

2.1 TENDER SUBMISSIONS

The submissions required at Tender shall incorporate, as a minimum, all information defined within the Appendices of this Specification. Any appendices not completely filled out will be rejected.

In addition to the Appendices the Manufacturer's selections data shall be provided incorporating the following:

- Performance data relevant to the schedules specification clause, including the Electrical full load amps, voltage and phase data
- Terms and conditions, incorporating inclusions & exclusions based on the scope defined within this specification and the associated works as defined within this specification.
- A full breakdown of the price and scope of the proposed lift installation.
- A full programme, scheduling the procurement of each lift incorporating the following as a minimum:
 - Design and approval phase
 - Manufacture and delivery of new equipment phase
 - Installation phase
 - Testing and Commissioning phase
- Provide a schedule of all process payments required throughout construction, detailing the level of scope expected to be complete at each payment.
- Compliance with the relevant Australian Standards and the current Building Code of Australia.
- Submit a breakdown of the proposed Comprehensive Service package incorporated into the DLP service contract and proposed future service contracts

2.2 PRE-CONSTRUCTION SUBMISSIONS

2.2.1 SAMPLES

Submit the following brochures to obtain approval prior to ordering:

- Car Signalisation Fixtures and Indication
- Landing Signalisation Fixtures and Indication
- Lift finishes

Supply the above to the architect and the consulting engineer at least 14 days before approval is required and notify the Head Contractor of their arrival.

2.2.2 WORKSHOP DRAWINGS

Provide one (1) PDF copy of the manufacturer's fully dimensioned construction drawings of the proposed lift equipment installation.

Drawings shall be prepared utilising AutoCAD & PDF drafting package detailing the following aspects of the installation.

- Full lift well dimensions, including set outs for door block-outs, cut-outs, etc., as required for structural trade coordination.
- Associated building works including penetrations through the structure, loads imposed on the structure, electrical and communication services requirements and termination points.
- Pit, rise and head room dimensions and clearances
- Lift machine room dimensions, clearances and penetration setouts
- Overhead beam detail
- Machine mounting details
- Car layout and finishes and elevations
- Landing entrances elevations
- Lift car ventilation

Examination of shop drawings shall not remove from the Contractor the responsibility for the correctness of the dimensions on such drawings nor compliance with Statutory Regulations.

The Vertical Transportation Services Contractor shall co-ordinate with all other trades necessary to ensure the installation meets the minimum requirements herewith of the specification. Obtain all available up-to-date CAD drawings from all other trades to ensure that all services are fully coordinated.

The Vertical Transportation Services Contractor shall ensure all workshop drawings review comments are adequately addressed prior to additional drawings being submitted for additional/final reviews. The consulting engineer will hold the right to refuse any drawings submitted where all review comments are not address.

Submit shop drawings with due account for the construction programme. Allow for 5 working days for the return of such drawings. Complete shop drawings ordering of equipment and accept responsibility for dimensions and configuration of equipment ordered to suit the spatial restrictions of the project.

2.2.3 AUTHORITIES, PERMITS, FEES, CERTIFICATES AND APPROVALS

Make applications, obtain all permits, and arrange testing, as necessary for the installation and placing into operation of the works where required by any Authority.

Provide all associated documentation required for the applications and pay all associated fees.

Where fee payments are required to be made by the proprietor, the Vertical Transportation trade shall pro-actively co-ordinate the application and installation of the relevant telecommunications authority, prior to structural completion of the lift shaft.

The Contractor shall upon completion of testing and commissioning, certify that the works have been completed and in accordance with the Building Code of Australia and relevant Australian Standards. Any alternative solutions to the deemed to satisfy provisions of the Building Code of Australia shall also be included within this certification.

2.3 CONSTRUCTION SUBMISSIONS

2.3.1 OPERATING AND MAINTENANCE INSTRUCTIONS

Within 30 days of reaching Practical Completion, three (3) copies of an Installation Manual, including a USB in each with the whole manual, are required to be handed over.

Initially one (1) copy shall be prepared and submitted to the Consulting Engineer for approval.

Proprietary manuals are suitable and should be written in clear concise English, including the following as a minimum:

- Index
- Directory Page
- Description & Operation Instructions
- Technical / Performance Schedules
- Maintenance Instructions
- Emergency Procedure
- Essential Safety Provisions
- Equipment Suppliers Literature
- All installation test checklists, certificates & guarantees (incl. certified by third party supervisor where regulated/required), including the following as a minimum:
 - Lift design registration certification by workplace services.
 - Workplace Services completed Lift Registration Certificates.
 - Essential Services testing and certificates.
 - Practical Completion and lift hand over certification.
 - Lift Door fire rated test certificate of compliance.
 - Warranty Lift Preventative Maintenance Agreement and schedules.

- Electrical & Controls Wiring Diagrams
- Commissioning Data
- 'As-Installed' Drawings and PDF copy of Operating and Maintenance manual
 - Hard copy
 - USB copy (DWG & PDF)

The manual shall be professionally prepared and bound in a vinyl hard-back folder with insert sleeves on the front to an approved format.

In addition, the project title and "Vertical Transportation Services" shall be inserted vertically along the spine insert sleeve of the folder.

2.3.2 AS-INSTALLED DRAWINGS

Before the date of practical completion "as-installed" drawings shall be provided with the installation manuals. These drawings are to be prepared on AutoCAD or later. Hard copies of the "as-installed" drawings along with copies of the AutoCAD Drawings are to be included on USB within the Operation and Maintenance Instructions. The work-as-executed drawings must indicate the full installation within the area of the works as it exists at the completion of the project including any design modifications which occurred during the project and any existing equipment.

2.3.3 USER TRAINING

Carry out training on systems provided under this trade package with the proprietor and other parties. The Contractor shall instruct the Proprietor's representative in the correct practice, routine adjustment and maintenance of the installation before it has reached practical completion.

Provide a program for user training for approval by the head contractor and Building Services Consulting Engineer.

The contractor shall confirm training has been undertaken with the above parties by completing a training record, signed by all parties. The record shall be incorporated into Operating and Maintenance manual.

2.3.4 INSPECTIONS, CERTIFICATES AND CONNECTION FEES

Inspections and Certificates

The Vertical Transportation Contractor shall carry out all the necessary inspections required to certify that the lift installation has been installed in accordance with the relevant codes, regulations and specification. Sufficient notice is to be given such that the Contract Administrator/Consulting Engineer may witness tests, operation and like. A minimum notice of 5 working days shall be given prior to any inspections and or witness tests

Signed Inspection reports shall be submitted to the services consultant upon completion. The Contractor shall also supply satisfactory evidence, in the form of certificates, recording test results showing that the lift has met the specification and relevant code and regulation requirements

Connections

The Contractor shall, on behalf of the Proprietor, make application to Telstra and Optus (dual-sim) for lift phone line and co-ordinate with the head contractor and proprietor for all payments necessary for connections and rental fees for the 12-month defect liability period.

The Contractor shall incorporate payment of Local Government Design and Registration Fees applicable to each lift installation.

3 GENERAL INSTALLATION REQUIREMENTS

The following clauses set out the general requirements for the works. These requirements are not intended to cover all aspects of the installation and must be read in conjunction with the Preliminaries and General Contract Conditions, this Specification and other cross references.

3.1 PRE-CONSTRUCTION REQUIREMENTS

Check on site at regular intervals the building working dimensions, tolerances and the setting out of the associated works. Immediately report any discrepancy.

Carry out the following works prior to the commencement of installation onsite:

- Clean out lift wells and inspect shaft construction to confirm the shaft will satisfactorily prevent water leakage into the shaft.
- Complete all laser surveys of shaft dimensions, sill requirements, FFL's, etc and submit a copy of reporting to the building trade and the consulting engineer.
- Confirm all Head Contractors' works are complete in accordance with the Vertical Transportation workshop drawings and the Structural workshop drawings. Please advise the design team where discrepancies occur between the two.
- Co-ordinate the requirement of temporary power where building power requirements have yet to be provided.
- Confirmation that lifting eyes/beams have been installed as shown on the Vertical Transportation workshop drawings
- All entrance protections and gate are installed. Coordinate installation with Head Contractor prior to any commencement onsite.
- All payments for connections such as Telstra, etc, have been made, such that the connections can be made prior to lift going into service.

3.2 MATERIALS EQUIPMENT AND WORKMANSHIP

Obtain approval for and maintain uniformity of the manufacturer and type of all materials and equipment. Use only new, current manufacture, first quality materials and equipment.

Ensure compatibility of materials and equipment with the installed environment in respect of ambient temperatures, utilities supply and vibration.

3.3 ELECTRICAL INTERFERENCE

Design and use electrical equipment which will not cause interference with electronic and electrical equipment in the vicinity. In the event that the inherent characteristics of equipment make interference possible, fit effective suppressors to eliminate the interference.

Maintain radio and television interference level within the limits set out in Australian/New Zealand Standard 1044 – Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus.

Maintain electrical disturbances within the limits set out in Australian Standard 2279 – Disturbances in mains supply networks. Comply with Australian Standard 4252 – Electromagnetic compatibility – Generic immunity standard.

3.4 BALANCING AND PHASE ROTATION

Balance each section of the installation evenly over all phases and ensure that phase rotation is correct throughout.

4 COMMERCIAL PASSENGER LIFT EQUIPMENT

4.1 GENERAL

The Contractor shall be responsible for complying fully with this Specification and for ensuring that good trade practice is observed and that all work is completed in a tradesman-like manner.

In particular, the capacities and platform sizes of the various items of installed equipment shall be not less than those specified and maintain satisfactory operation under all load conditions.

The Contractor shall make all necessary adjustments to the equipment to satisfy the Consulting Engineer that the installation meets the requirements of this Specification.

Use equipment which operates within the required noise and vibration limits. Prevent the transmission of vibration equipment and lift travel to other building elements.

Select equipment to suit the configurations and spatial restrictions as indicated in the performance specification.

4.2 PERFORMANCE REQUIREMENTS

All vertical transportation installations are required to comply with the following design requirements:

Floor Levelling Accuracy	In compliance with AS1735.12 & the NCC V1
Door Dwell Times	In compliance with AS1735.12 & the NCC V1
Car Walls, fixtures & Controls	In compliance with EN81 (SET), AS1735 (SET) & the NCC V1
Traffic Flow	2 Way (50% up/50%down)
Door Open/Close Time	2.0s / 2.5 s
Maximum Start Delay	0.5 s
Maximum Levelling Delay	0.5 s

4.3 INSTALLATION SCHEDULES

General:

Minimum Compliance Requirements

Facilities for the Disabled:	Lift Comply with Australian Standard AS 1735.12 Lifts, Escalators and Moving Walks – Facilities for Persons with Disabilities.
Landing Doors and Equipment:	Comply with the NCC, Section C3.10
Lift Floor Dimensions:	Comply with the NCC, Section E3.6
Lift Lighting:	Comply with the NCC, Section E3.6
Lift Emergency Lighting:	Comply with the NCC, Specification E3.1.3
Lift Emergency Phone:	Comply with the NCC, Section E3.6
Handrails:	Comply with the NCC, Section E3.6

Car / Landing Controls: Comply with the NCC, Section E3.6 and AS1735.12.

Fire Service Controls and switching: Comply with the NCC, Section E3.7, E3.9 and E3.10

Lift Equipment

Emergency Lowering Device: Fully Automatic

Hoisting System: Fully Automatic

Automatic Control System: Conventional 2 button directional collective, micro-processor based

Drive System: Gearless

Door frame type: Brushed stainless steel, standard boxed frames.

Guide Shoes: Slipper type to car and counterweight.

Performance Requirements:

Lift Designation **L-1**

Lift Equipment

Number of Lifts: 1

Classification: Class A - Passenger

Machine Type/Machine Location: MRL (within lift well headroom)

Carrying Capacity: 17 Passenger / 1275 kg (nom.)

Minimum Lift Car Speed: 1.0 m/s (min)

Minimum Acceleration 0.5 m/s² (min)

Minimum Jerk Rate 0.8 m/s³ (min)

Clear Lift Platform Dimensions: 1400 mm W x 2100 mm D

Clear Lift Car Height Dimension: 2400 mm H

Lift Car Arrangement: Single Entry

Landing/Car Clear Door Dimensions: 1000 mm W x 2100 mm D

Door type: Power operated 2 panel centre opening

Lift Well

Lift Well Size: 2250 mm W x 2800 mm D

Bottom Overrun (Pit): 1300 mm

Top Overrun (Headroom): 4300 mm

Floor Heights Refer to Section 1

Car Finishes

All Walls: Standard Range

Ceiling: Standard Range

Skirting: Standard Range

Handrails:	Brushed stainless steel to one side wall minimum
Car Flooring:	By Others (refer to associated works)
Car Lighting:	LED Downlights – six (6) minimum
Landing Sills:	Natural Anodised aluminium

Other

Access Control:	Yes
CCTV:	No
Emergency Lift:	No
Regenerative Drive:	No
Advanced Door Opening:	No
Landing Key Switch:	No
Car Operating Panel:	1
Door Protection Device:	3D
Communications Back-up:	Yes - 4G GSM (dual-sim)

4.4 ENTRY SUMMARY

FLOOR	L-1
Basement	Front
Ground	Front
L1 – L4	Front
Total	6

4.5 CONTROLS GENERAL

Provide a control system in accordance with above, required for proper satisfactory operation and performance, maintenance and safety of the Vertical Transportation installation, under all conditions of service and in every way suitable for the working environment. Any control strategies not mentioned below are to conform to relevant codes and standards as required by legislation and be compatible with manufacturer's recommendations of the equipment served, to provide satisfactory stable operation.

4.5.1 LANDING INDICATION

- Recessed mounted unit with illuminated up/down indication and lift location indication to all entrances.
- Provide a noise 3 seconds before arriving to indicate imminent lift arrival.

4.5.2 LANDING CALL STATIONS

- Locations shall be in accordance with AS1735.12-1999 Section 7.
- Recessed mounted unit.

- Self-illuminating call recorded type tactile/Braille proprietary type direction buttons (allowance for circular buttons)
- The landing panel shall also be equipped with:
 - Engraving featuring 'DO NOT USE LIFTS IF THERE IS A FIRE' filled in red, size of text in accordance with the Building Code of Australia
 - Disabled persons illuminating vandal resistant push-buttons with solid-state light source and tactile/Braille identification symbol.
 - Fire control return switch

4.5.3 CAR OPERATING PANEL

- Compliant with AS 1735 Part 12, 'Facilities for persons with disabilities' as a minimum
- Standard height panels
- Flush mounted panels
- One (1) panel per car, complying with the following:

Item	Description	Function	Responsibility
Position Indicator	LED type indication	Show current lift car position	VT Services Trade
Destination Indicator	LED type indication	Show direction of lift car travel	VT Services Trade
Destination buttons source	Self-illuminating vandal resistant push buttons with solid-state light. "Dewhurst" circular type	Select the lift car destination	VT Services Trade
Lights	"On/Off" Test key operated switch	In the "ON" position, emergency lighting to operate from its battery supply. In the "OFF" position, operate via normal lift car lighting.	VT Services Trade
Alarm / Emergency Phone Button	Self-illuminating Push button	Provide car bell alarm system comprising chargeable battery system located on the roof of each lift car which activates when button is pressed. When button is pressed, automatically contact the manufacturer's emergency 24 hour	VT Services Trade to provide complete dual-sim phone installation and car bell alarm system.

Item	Description	Function	Responsibility
		answering service, providing handsfree two-way emergency voice communication.	
Door close button	Self-illuminating Push button	Close the lift car doors	VT Services Trade
Door open button	Self-illuminating Push button	Open the lift car doors	VT Services Trade
Attendant "Off/Auto"	Key operated switch. Key shall not removable in the Attendant position		VT Services Trade
Fire lift controls			VT Services Trade
Car ventilation	Fan	On / Off switch	VT Services Trade

6 ELECTRICAL WORKS

6.1 GENERAL

This section of the Specification covers the supply and installation of wiring, and other associated equipment to provide a complete and safe electrical installation to serve all equipment covered by the Vertical Transportation Services Specification.

The Vertical Transportation Services Trade shall prepare an equipment electrical schedule detailing all electrical loads for lift equipment and issue to the Proprietors Electrical Contractor prior to the purchase of sub-mains cabling. The Vertical Transportation Services Trade shall be responsible for any costs associated with abortive work resulting from failure to observe this requirement.

6.2 REGULATIONS

All electrical work shall be carried out in accordance with the AS/NZS 3000 and the Local Power Supply Authority's requirements, and shall be carried out under the supervision of qualified electricians who hold the requisite certificates of competency.

The Contractor shall provide supply to all equipment covered by the Specification where such supply is not specified as being by the proprietor's electrical contractor.

6.3 EXTENT OF ELECTRICAL SERVICES

Provide a complete Electrical Installation as required for proper satisfactory operation, control maintenance and safety of the Vertical Transportation Services, under all conditions of service and in every way suitable for the working environment.

Supply and install the following electrical components and all others specified elsewhere.

- Vertical Transportation Services proprietary lift control equipment and associated power cabling to all equipment supplied and installed under this package unless noted otherwise.
- Trailing flexes complete with spare wires of at least 10% of the number of initially effected wires inclusive or at least 2 spare shielded cables per lift.
- Motors, starters, starting gear and controls, complete with all necessary accessories for all electrically operated equipment.
- All control wiring, switch gear and connections within and between the controls cubicles/switchboard, and to equipment and the like.
- Provision of alarm bell, communications, general purpose power in accordance with the relevant regulatory authorities.
- Manually reset overload protection for all motors.
- Fuses or circuit breakers as appropriate for all items of equipment and control circuits.

6.4 WIRING SYSTEMS AND SWITCHGEAR

General

- In general, conductors shall consist of PVC insulated stranded copper cable. No joints will be allowed in any cables, except at approved terminals at switchboards or equipment.
- All wires and cables, except where otherwise specified, shall be of 600/1000-volt grade of approved manufacture. Each coil of wire or cable delivered on the job shall bear the maker's label intact, otherwise it shall be liable to rejection.
- All wiring shall be looped. All wiring in which kinks or abrasions occur will be condemned and shall be replaced at no additional expense to the Contract.
- Distinctive colours shall be used for all conductors throughout the installation.
- In the event of any errors occurring the circuit shall be rewired at no additional expense with the correct colour.
- Earthing conductors shall be sized in accordance with Australian Standard 3000, SAA Wiring Rules, and all earth conductors shall be yellow/green PVC covered.
- For cables to motors, no conductors of less cross sectional area than 2.5 sq. mm stranded shall be used. All wiring to instruments, controls etc. shall be run in multi-strand cables.

Conductors

- In general, all conductors shall be installed in sheet metal duct with removable covers.
- In vertical duct runs, support the weight of the cables at not more than 2000mm centres.
- The draw-in system of wiring shall be used throughout.
- All fittings shall be screwed and, in the event of it being impossible to carry screwed conduit into a screwed fitting, flexible plastic conduit shall be used; no exposed wiring will be permitted. Flexible plastic conduit shall also be used wherever a conduit run crosses a vibration isolating joint or connects to vibration isolated equipment. All flexible conduits shall be terminated with an approved adaptor fitting.
- Within non-finished areas of the lift installation, double insulated conductors may be used either run on cable trays or clipped to the lift well structure at intervals not exceeding 1 metre.

Conduits

- The number of wires installed in any concealed conduit shall not exceed 75% of the maximum number laid down by Australian Standard 3000.
- Minimum size of conduit shall be 20 mm nominal diameter.
- Conduit and fittings shall be free from burrs and projections. Conduit ends shall be internally bevelled by reaming to prevent damage to cable insulation.

- Conduits shall be prepared for a draw-in system. All conduits shall be installed and fixed in position before cables are drawn in.
- Install all conduits so that there is not more than 360 degrees (as a summation of all bends, sets etc.) between adjacent draw-in points (ie. maximum of 4 bends) of a conduit system.
- Conduits shall be plugged or capped using a suitable cap at all times to prevent entry of water or other foreign matter until fittings are installed. Clean and dry all conduits by pulling a brush or plug of cloth through the conduit before installing wiring.
- Conduits run surface or concealed but readily accessible shall be run neatly square with lift shaft.
- Wiring to equipment shall be enclosed in flexible PVC conduit adequately anchored.
- Conduit: PVC conduit shall be Class B high impact strength rigid PVC conduit to comply with Australian Standard 2053.
- All joints in PVC conduits shall be carefully glued according to manufacturer's recommendations.
- Expansion joints shall be inserted at intervals to A.S. rulings whether conduits are cast in or surface mounted.
- Support conduit to allow for expansion, at distances not exceeding 600mm.
- Contacts shall be derated, by a minimum factor of 2 - ie contact rating shall be at least twice connected load.

Electronic Components

- Where electronic components are used, the circuits shall be carefully designed, and components chosen for reliability and long life.
- Where commercially available equipment, modules, and the like are incorporated into the system, use this equipment strictly in accordance with manufacturer's instructions and within manufacturers limitation.
- All circuits and terminals associated with electronic components shall be segregated from all other circuits and terminals. All terminals associated with electronic components shall be clearly labelled.
- Each circuit supplying any item of electronic equipment shall be fitted with surge suppression to reduce the effect of voltage transients. The minimum acceptable system is a succession of metal oxide varistors.
- Submit for review full details of all circuits, controls, surge suppression and the like incorporating electronic components, prior to manufacture or assembly.

7 TESTING AND COMMISSIONING

7.1 PRE-COMMISSIONING PROCEDURE

Carry out the following works prior to the commencement of the commissioning of the systems:

- Submit for approval a detailed commissioning plan indicating step by step testing strategy, proposed equipment for each type of test and program.
- Submit for approval, instrumentation calibration certificates, commissioning and test log sheets.
- Clean out lift wells and inspect shaft construction to confirm the shaft will satisfactorily prevent water leakage into the shaft.
- Co-ordinate the requirement of temporary power where building power requirements have yet to be provided.
- Complete all laser surveys of shaft dimensions, sill requirements, FFL's, etc and submit a copy of reporting to the building trade and the consulting engineer.

7.2 COMMISSIONING

Supply the necessary test loads and measuring equipment and carry out all tests required by the regulatory authorities and specified in the relevant Code and Standards.

Carry out all adjustments necessary for the safe, reliable and satisfactory operation of the plant prior to the Practical Completion.

Practical completion will be certified only after the plant has been inspected and approved and the requirements of this section of the specification are fulfilled.

Test run the lift installation such that it can demonstrate that the lift operates correctly and meets the performance requirements under normal running conditions. During commissioning perform the following tests as a minimum:

- Door operation and timing tests
- Car levelling and parking tests
- Maximum car speed tests
- Lift car drop test.
- Total travel time from lift call operation to car arrival tests
- Confirm all communications and security functions operational
- Run tests confirming all the above requirements

Plant and equipment

Check the operation of the Lift and equipment including motor drives, noise and vibration levels, counterweights, guards, buffers, oils, etc.

- Check and prove all operating and safety controls
- Check and prove performance characteristics at full load.

Electrical systems

Progressively and finally test the complete installation to ensure it is mechanically and electrically safe and operates correctly under normal, emergency and fault conditions

- Check all terminations, clamps and fixings
- Check phase identifications match throughout the installation
- Check for excessive heating at all joints.

Testing of Safety Equipment

All items of safety equipment shall be tested by creating the appropriate fault condition. Provide skilled technicians to commission the plant and associated controls to the satisfaction of the Engineer.

8 MAINTENANCE

8.1 SCOPE

Maintain and service the complete installation for a period of 12 months from the date of Practical Completion. Routine maintenance visits shall be scheduled on a monthly basis.

- Carry out monthly inspections and carry out all maintenance, servicing and test procedures in accordance with the current requirements of the Australian Standards and Building Code of Australia
- Maintain the lift in a condition to meet the specified performance
- Provide all components and materials
- Promptly rectify faults. Replace faulty materials and equipment without charge
- Complete log book entries recording these procedures post all inspections
- Provide a proprietary comprehensive Maintenance Agreement for all materials and labour
- Quarterly reports on maintenance undertaken and operational lift performance
- Annual risk management and safety to operate test certification reports.

Maintain all equipment included in this contract in perfect operation during the term of the Guarantee and Maintenance Period and provide emergency service on a 24 hour call out basis.

At the end of the maintenance period make a final service visit and upon satisfactory completion of the above procedures certify in writing that the installation is operating correctly.

8.2 MONTHLY MAINTENANCE

At each maintenance visit ensure no less than the following functions shall be carried out in addition to the manufacturer's recommended maintenance activities.

- Check pit/s for excess oil/grease, water and/or leaks and general cleanliness
- Check all components are clean, dust free, have no corrosion, etc
- Check all terminal buffers
- Check all bearings for correct operation. Lubricate and replace where necessary
- Check all drives couplings, counterweights (guards and shoes)
- Check all electrical systems (circuit breakers, controls cabinet, indicator lights, interlocks, etc)
- Check all emergency lighting, car buttons, etc.
- Check landing entrance equipment

- Check car door operations and car levelling accuracy

Provide all consumable necessary for the proper maintenance and servicing. Replace all components worn during the maintenance period including drives, pulleys, fuses, globes, etc.

8.3 BI-ANNUAL MAINTENANCE

In addition to the Monthly Maintenance requirements and at intervals not exceeding 6 months the following minimum functions shall be carried out:

- Repeat the monthly maintenance items as a minimum
- Clean and adjust all switchgear, contractors, and starters
- Check calibration of all controls
- Check all safety controls and gear
- Check all suspension ropes/media & pulleys
- Check drive motor and all associated assembly
- Check noise and vibration
- Check all paintwork and finishes

Provide all consumable necessary for the proper maintenance and servicing. Replace all components worn during the maintenance period including drives, pulleys, fuses, globes, etc.

Service

The Contractor shall undertake to provide a comprehensive breakdown of service whereby a qualified mechanic attends the plant promptly after a breakdown is reported and carries out immediate remedial work.

Where the Contractor fails to attend the plant within eight (8) working hours of notification of breakdown and where remedial work is interrupted during normal working hours for purposes other than obtaining spare parts from the nearest source, the Proprietor reserves the right to order such action as may reasonably expedite completion of remedial work at the Sub-Contractors expense.

Service Reports

During each service visit complete a report in the form of a check list which shall indicate the readings of all equipment, the condition of all items, any remedial work carried out. Arrange to have Service reports countersigned by the Proprietor's representative, prior to leaving site.

Final payment of retentions monies will only be certified pursuant to receipt of 12 Service Reports which indicate that the Maintenance and Service requirements have been regularly and satisfactorily completed.

APPENDIX A – TECHNICAL DATA SCHEDULE

This schedule is required to be filled out at time of Tender Submission. All equipment is to be in accordance with the Specification. In addition to information requested below, provide at time of tender all manufacturer's selection print-outs indicating compliance with the performance requirements specified at the nominated conditions.

Lifts

Designation	Unit	L-1
Carrying Capacity	kg	
Internal Car Dimensions	W x D x H (mm)	
Car Door Dimensions	W x H (mm)	
Shaft Dimensions (incl. trimmer)	W x D (mm)	
Trimmer Beam Width	W (mm)	
Pit Depth	m	
Overrun	m	
Speed	m/s	
Total Electrical Power Supply	A/Φ/V	
Landing Entrances		
Car Entrances		
Door Configuration	SE / TE	
Door Protection Device	3D	
No. of Full Height Lift COP / car	#	
Door Jambs	Type	
Roller Guides (all spring loaded)	Y/N	
In-car Communications	Y/N	
Recessed landing Fixtures	Y/N	
Auto Emergency Lowering	Y/N	
Regenerative Drive	Y/N	
Access Control	Y/N	
Dual-Sim Phone Provisions	Y/N	
Fire Services (EWIS, WIP, Controls)	Y/N	
Lifting Equipment	Beam/Eyes	
Temporary Protection (supply)	Y/N	
Registration Fees	Y/N	
DLP (Comprehensive)	Y/N	
Good lift blankets (one per bank)	Y/N	

Tenderer **Date**

Contract Administration Period (weeks)

L-1

Design, Manufacture and Delivery

Installation/lift

Commissioning and testing / lift

Tenderer

LUCID CONSULTING AUSTRALIA
LCE13523

Date

APPENDIX B – TENDER PRICE SCHEDULE

These schedules are required to be filled separately in detail as outlined below, at the time of Tender Submission. The amounts indicated in the total Tender price including administration costs and profit for sections of the work are as follows:

SECTION COSTS

No.	ITEM	AMOUNT TENDERED
1.	Vertical Transportation Services	
	Lift Installation	\$
	Dual-Sim Installation	\$
	Other (specify)	\$
	SUB TOTAL	\$
	PLUS 10% GST	\$
	TOTAL	\$
2.	Ongoing Comprehensive Preventative Maintenance Costs (post 12 month DLP)	
	2 Year Contract	\$
	3 Year Contract	\$
	5 Year Contract	\$
	10 Year Contract	\$
3.	Lift Costs During Construction– <i>Cost per lift</i>	
	Re-tuning, re-testing, re-commissioning, intercom/car.	\$ /lift
	Landing protection, intercom per landing	\$ /Week
	Rental / week	\$ /Week

Tenderer's shall detail below any items which vary from specified requirements.

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APPENDIX C - SCHEDULE OF PERSONNEL

This schedule is required to be filled out at time of Tender Submission.

Project Manager

Years' Experience with Company / Industry

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..... /

Site Manager/Foreman

Years' Experience with Company / Industry

.....
..... /

Commissioning Technician

Years' Experience with Company / Industry

.....
..... /

Tenderer **Date**