

# **Lift Replacements**

## **Albion Towers, Redbridge Towers and Shirley Towers**

### **PERFORMANCE SPECIFICATION**

**RP200299**

#### **CAPITAL ASSETS**

Southampton City Council

Civic Centre

Southampton

SO14 7LY

Telephone 023 8083 2272

## Quality Management

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<b>Prepared by 1</b>	Paul Middleton	Signature (for file)	
<b>Prepared by 2</b>		Signature (for file)	
<b>Prepared by 3</b>		Signature (for file)	
<b>Checked by</b>		Signature (for file)	
<b>Checked by 1</b>		Signature (for file)	
<b>Authorised by</b>		Signature (for file)	

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### 3.1 Introduction

This specification is for full replacement of the existing electric traction top drive direct acting 1:1 passenger lifts at the following Tower Blocks in Southampton:

Albion Towers. Golden Grove, Southampton, SO14 1HZ.

Redbridge Towers. Cuckmere Lane, Southampton, SO16 9AT.

Shirley Towers. Church Street, Southampton, SO15 5PD.

The new lifts shall as far as possible comply to the recognised standard lift car interior dimensions: 1100mm wide x 1400mm deep for a 630kg 8 person and 1350mm wide x 1400mm deep for a 800kg 10 person. It is however accepted that due to the constraints of the existing lift shafts, door opening position and other openings (e.g. rope holes through machine room floor) this may not be possible.

Wherever possible the existing structural door openings, holes through machine room floors, etc., should be utilised. However, where new openings, etc., are required or need to be modified to accommodate the new equipment layout; the contractor shall allow for and submit all structural calculations with their design submission. The contractor shall state within their tender what has been allowed for.

The existing clear lift door openings are approximately 2100mm high whereas the new clear door opening height is to be 2000mm. The contractor shall allow for reducing the structural opening height as necessary to provide a certified fire rated lift shaft front wall. Infill panels, extended architrave headers or transom panels will not be considered.

Refer to section 3.3 Particulars of new lifts for details of each.

The lifts at Redbridge Towers serve alternate floors with duplex residential flats accessed from these same alternate floors only. The contractor shall develop their programme to minimise disruption to residents and provide active resident liaison on the basis that some residents may have difficulty using stairs.

Where '*(contractor to confirm)*' is stated, the contractor shall confirm the required information as a part of their tender submission.

## 3.2 Standards

3.2.1 The following is a list of standards that the lifts will comply to. This list is not exhaustive and contractor will need to make sure the lift works take into account all required regulations and standards: –

- EC Directive 95/16 - The Lift Regulations
- EN81 – 20 - Safety rules for the construction and installation of passenger and goods passenger lifts
- EN81 – 21 - New passenger lifts in existing buildings
- EN81 – 28 - Remote Alarms
- EN81 – 50 - Design rules, calculations, examinations and tests of lift components
- EN81 – 58 - Landing doors fire resistance test
- EN81 – 70 - Disabled Access
- EN81 – 71 - Vandal Resistant Lifts (category 2)
- EN81 – 73 - Behaviour in event of fire
- BS 7255 - Safe working on lifts
- BS8486 – 1 - Testing of lifts
- Equality Act 2010

3.2.2 The Contractor shall include for all latest standards to ensure that all the equipment fitted fully complies.

### 3.3 Particulars of the new lifts

Site	-	Albion Towers. Golden Grove, Southampton, SO14 1HZ.
Number of lifts	-	2
Location	-	Central core
SCC Unit No's	-	1001 and 1002
Lift Type	-	Electric top drive traction 1:1
Lift Capacity	-	10 persons ( <i>contractor to confirm</i> )
Lift Speed	-	1.60m/s
Levels Served	-	9 (G, 1, 3, 5, 7, 9, 11, 13 and 15) all at the front
F.S.A.L	-	G
D.D.A. Exit	-	G
Drive system	-	Gearless AC synchronous VVVF
Motor starts	-	240 per hour
Control system	-	Duplex down collective
Roping arrangement	-	1:1
Travel height	-	Existing ( <i>contractor to confirm</i> )
Pit	-	Existing ( <i>contractor to confirm</i> )
Headroom	-	Existing ( <i>contractor to confirm</i> )
Lift shaft width	-	Existing ( <i>contractor to confirm</i> )
Lift shaft depth	-	Existing ( <i>contractor to confirm</i> )
Motor Room Location	-	Directly above lift shafts
Internal lift car dimensions	-	To suit existing lift shaft ( <i>contractor to confirm</i> )
Door type	-	Fully automatic ( <i>contractor to confirm arrangement</i> )
Door opening dimensions	-	800mm x 2000mm

Site	-	Redbridge Towers. Cuckmere Lane, Southampton, SO16 9AT
Number of lifts	-	2
Location	-	Central core
SCC Unit No's	-	1038 and 1039
Lift Type	-	Electric top drive traction 1:1
Lift Capacity	-	8 persons ( <i>contractor to confirm</i> )
Lift Speed	-	1.60m/s
Levels Served	-	11 – 1038 odd floors (G, 1, 3, 5, 7, 9, 11, 13,15, 17 and 19) all at the front 10 – 1039 even floors (G, 2, 4, 6, 8, 10, 12, 14, 16 and 18) all at the front
F.S.A.L	-	G
D.D.A. Exit	-	G
Drive system	-	Gearless AC synchronous VVVF
Motor starts	-	240 per hour
Control system	-	Duplex down collective
Roping arrangement	-	1:1
Travel height	-	Existing ( <i>contractor to confirm</i> )
Pit	-	Existing ( <i>contractor to confirm</i> )
Headroom	-	Existing ( <i>contractor to confirm</i> )
Lift shaft width	-	Existing ( <i>contractor to confirm</i> )
Lift shaft depth	-	Existing ( <i>contractor to confirm</i> )
Motor Room Location	-	Directly above lift shafts
Internal lift car dimensions	-	To suit existing lift shaft ( <i>contractor to confirm</i> )
Door type	-	Fully automatic ( <i>contractor to confirm arrangement</i> )
Door opening dimensions	-	800mm x 2000mm



Site	- Shirley Towers. Church Street, Southampton, SO15 5PD.
Number of lifts	- 2
Location	- Central core
SCC Unit No's	- 1047 and 1048
Lift Type	- Electric top drive traction 1:1
Lift Capacity	- 10 persons ( <i>contractor to confirm</i> )
Lift Speed	- 1.60m/s
Levels Served	- 9 (G, 1, 3, 5, 7, 9, 11, 13 and 15) all at the front
F.S.A.L	- G
D.D.A. Exit	- G
Drive system	- Gearless AC synchronous VVVF
Motor starts	- 240 per hour
Control system	- Duplex down collective
Roping arrangement	- 1:1
Travel height	- Existing ( <i>contractor to confirm</i> )
Pit	- Existing ( <i>contractor to confirm</i> )
Headroom	- Existing ( <i>contractor to confirm</i> )
Lift shaft width	- Existing ( <i>contractor to confirm</i> )
Lift shaft depth	- Existing ( <i>contractor to confirm</i> )
Motor Room Location	- Directly above lift shafts
Internal lift car dimensions	- To suit existing lift shaft ( <i>contractor to confirm</i> )
Door type	- Fully automatic ( <i>contractor to confirm arrangement</i> )
Door opening dimensions	- 800mm x 2000mm

### 3.4 Finishes Schedule

Landing door frames	- 316 grade Rimex 7GM pattern stainless steel
Landing door panels	- 316 grade Rimex 7GM pattern stainless steel
Landing Architraves	- 316 grade patterned and coloured stainless steel – Rimex Blue Pippin
Lift car fronts and corners	- 316 grade patterned and coloured stainless steel – Rimex Blue Pippin
Lift car walls	- 316 grade Rimex 7GM pattern stainless steel
Lift car rear wall mirror	- Rimex Super Mirror – polished stainless steel.
Lift car handrails	- Tubular 38mm diameter brushed stainless steel
Lift car doors	- 316 grade Rimex 7GM pattern stainless steel
Lift car skirting, trims, COP, etc	- 316 grade brushed stainless steel
Lift car ceiling	- 3mm thick 316 grade brushed stainless steel with punched holes and a white 4mm thick impact resistant fire retardant macrolon diffuser
Lift car lighting	- LED within ceiling void
Lift car floor	- 10mm thick deep blue epoxy resin with coved and radiused edges
Landing station faceplates	- 316 grade 180 grit brushed stainless steel

## 3.5 Performance Requirements

### 3.5.1 General

- 3.5.1.1 The contractor shall allow for all builders and electrical work in conjunction with the works detailed within this specification and shall allow for management, supervision and arranging all permits to work.
- The contractor shall allow within their tender for the particular skills and costs this will impose on the works.
- 3.5.1.2 All personnel may be required to sign in and out of the building every time.
- 3.5.1.3 Working hours will be restricted to 0800hrs – 1700hrs Monday to Friday
- 3.5.1.4 Full height vandal resistant and certified fire rated hoardings must be placed on each landing accessible with a SCC CC100 key.
- Hoardings must not reduce access on the landing below 1500mm.
- In addition, all holes and other openings through walls to be made good with certified intumescent fire stopping, this includes any temporary openings overnight.
- 3.5.1.5 Materials may be stored outside the building in a lockable storage container or in the machine room area only. No materials may be stored on landings.
- 3.5.1.6 Due to the nature of the buildings, residential tower blocks, one lift is to remain in service at all times. The contractor is responsible for all regular planned maintenance visits and 24 hour callout cover to the existing lift in accordance with the specification for lift maintenance and callout included as a part of these works.
- Considering the additional usage of the one lift that is to be available for service to residents at all times during the works, the contractor shall include within their tender costs to replace any component that may cause reliability of service issues whilst the other lift is being replaced.
- As a minimum, the lift car and ground floor landing door hanger rollers shall be replaced on the existing lift that is to remain in service whilst the other lift is being replaced. All this work shall be carried out whilst the other lift is in service.
- 3.5.1.7 The Contractor shall be responsible for surveying and satisfying themselves of all technical and operational details of the proposed lifts prior to their tender in order to effect the installation in accordance with the standards quoted. The Contractor shall include for all latest standards and regulations to ensure that all new equipment fitted fully complies with the latest standards at time of handover.
- The whole installation (both lifts) is to fully comply with the requirements of BS EN 81-71 Vandal resistant lifts – for category 2 lifts in order to protect the lift installation from severe acts of vandalism in buildings.**
- 3.5.1.8 The products shall be fully in accordance with the specification, and of suitable robust nature for the installation to achieve a life expectancy of 25 years, with no more than routine maintenance and repairs.

- 3.5.1.9 Particular attention is drawn to the required robustness, anti-vandal requirement to category 2 of BS EN 81-71, corrosion resistance and Disabled Discrimination Act (DDA) requirements necessary due to the nature of each site.
- 3.5.1.10 This specification names proprietary open source components from specified component manufacturers. It shall be acceptable to change these to other open source manufacturer's components provided that agreement is raised in advance from the CA and the ability of the council to remotely monitor the equipment is unaffected. To obtain this agreement documentation to prove that the alternative component is an enhancement will need to be provided. Including examples of equipment in service, installed and maintained by the tendering contractor for at least 4 years.
- 3.5.1.11 To ensure equal tender analysis all bids shall however be for fully compliant products.
- 3.5.1.12 All components used within the bid must be directly available to any full member of LEIA or EEA to enable ease of future maintenance.
- 3.5.1.13 The documentation provided to the CA shall demonstrate that the proposed alternatives are of equal or greater quality, robustness, and are totally interchangeable without affecting form, function of the lift, or reliability.
- 3.5.1.14 Any agreed alternative component must not in any way increase any foreseeable ongoing costs for maintenance or monitoring of the lift.
- 3.5.1.15 The CA shall provide written agreement of any proposed substitution prior to it being introduced.
- 3.5.1.16 Proposals for substitutions after award of the contract shall include any cost savings to contract sum that the substitution will provide.
- 3.5.1.17 Any concerns or clarifications regarding the specification shall be addressed in writing to the Contract Administrator (CA) who will provide clarification following consultation with the appropriate specialist consultant for the works. The CA's decision shall be final.
- 3.5.1.18 Products installed which in the opinion of the CA do not fully comply with the requirements of the specification or are not suitable for the environment shall be replaced with suitable prior to awarding completion of the effected sections of the contract at no additional cost to the contract.
- 3.5.1.19 In instances where there is disagreement or confusion over the interpretation of a clause within the tender documents, the CA shall make the final decision following consultation with the appropriate design consultant and the contractor.
- 3.5.1.20 All variations to the contract shall be agreed with the CA, who shall issue a written instruction to cover. Any works carried out without a written instruction shall have nil value, and will be considered not issued.

The new lifts shall be CE Marked and compliant to the standards and regulations indicated in the lift particulars.

Where a CE marked product is necessary for items not directly specified or if notified body approvals are required, this shall be included.

Where notified body approvals are required all costs involved in that

operation or operations are to be included with the lift tender sum. The CA shall also be informed to ensure that any arrangements necessary to achieve compliance do not affect the installation programme.

### **3.5.2 Asbestos Removal**

3.5.2.1 The Contractor needs to be aware of the following which needs to be allowed for in the items below:

Asbestos Refurbishment and Demolition Survey reports have been included with the tender documents. The Contractor will allow for removal of all asbestos identified within this report within his tender, where this is in close proximity of the works and there is a risk that this will get damaged in the process of carrying out works.

Some areas of buildings were not accessible during the Asbestos Survey and are reflected within the Asbestos Refurbishment and Demolition Survey report. The Contractor will organise a follow up Asbestos Refurbishment and Demolition Survey's to determine whether or not Asbestos Containing Materials (hereinafter referred to as ACM's) are present within these areas. These surveys will be carried out while works are in progress and the Contractor should allow for appointing, providing all necessary attendance and for liaising with the Asbestos Surveyor to facilitate these surveys. Until such times as the Asbestos Refurbishment and Demolition Survey has been completed, the Contractor should take care when accessing these areas and assume that asbestos is present.

Any non-licensed operatives must have received appropriate task sheet training prior to working with ACM's.

All licensed works must include for all required notifications to the HSE.

Include for decontamination units as may be required for works.

Liaise with Southampton City Council's Environmental Health Team and follow any directions issued. Seek approval from the Contract Administrator for any directions that have a financial implication.

Following removal of ACM's all necessary air tests, will be undertaken by a UKAS accredited laboratory, who will independently appointed directly by Southampton City Council. This is to avoid a possible conflict of interests and to comply with Southampton City Council's policy 'SWP Asbestos'.

The Contractor will however, be responsible for all management and necessary liaison with the independent analyst who has been appointed to carry out the air tests, including providing all necessary attendance and coordination to ensure that air tests are carried out in a timely manner to avoid delays to the contractors programme.

All works for removing, transporting and disposing of ACM's to a licensed tip must be fully in accordance with current legislation, The Control of Asbestos Regulations 2012 (CAR) and applicable HSE Guidelines within HSG 210. Compliance with CAR 2012 will include notifying Notifiable Non-Licensed Work where required to the relevant enforcing authority; obtaining required medical examinations for workers working with asbestos; and maintaining a register for each worker of the type and duration of work carried out with asbestos.

In addition to statutory requirements the Contractor and all specialist sub-contractors must at all times fully comply with Southampton City Council's Asbestos Policy, including supply Southampton City Council with details of changes made following asbestos works on Southampton City Council's 'Asbestos Action Return' form. See Health and Safety pack appended to this document for further details.

Include in the rates for all necessary equipment and PPE and all miscellaneous items and plant required to carry out the works.

Prepare method statements and carry out risk assessments as required to carry out works.

Include for costs of disposal of all removed ACM's, waste materials etc.

Provide certification including Employers 'Asbestos Action Return' form and Waste Transfer Note to Contract Administrator. Note that Practical Completion will not be deemed to be achieved until these documents are provided.

3.5.2.2 Remove and dispose of all ACM's identified that may potentially get damaged or requires removal in the course of the contract works and fully manage the process of removal and all sub-contractors carrying out this work.

See pricing Document for provisional sum for unknown asbestos at tender stage

3.5.2.3 Asbestos Surveys

The Asbestos Demolition Survey Report has identified the some areas of the building inaccessible and are not surveyed

The Contractor shall make all necessary arrangements and shall provide all necessary attendance and access (including scaffolding etc if required) for the Employers Asbestos Surveyor to inspect these areas during the course of the works.

### **3.5.3 Design, installation and working drawings**

3.5.2.1 The contractor shall provide an electronic set of full installation drawings within four weeks of the contract being placed.

3.5.2.2 The CA will require up to fourteen days from receipt of drawings to examine/comment and, if necessary, a further fourteen days from receipt to re-examine where the initial issue is not acceptable.

3.5.2.3 The CA will return the contractor's working drawings with appropriate written comments. The contractor shall amend as required and re-submit drawings within fourteen days.

3.5.2.4 The installation drawings shall include all dimensions and details necessary for the lift installation and the following:

- a) General arrangements for the lift motor room including all steelwork, controllers, plant and machinery, safe working clearances, access, etc. Loadings of machine supports and fixings are to be provided along with the dimensions and position of all holes, cut-outs and builders work.

- b) General arrangement for the lift shaft and pit including the position of fixings for all plant and materials including guide fixings, doors, frames, pushes, indicators, buffers, access ladders, lift shaft lighting etc. The size and position of all openings, cut-outs through walls and slabs and all builders work shall be given with the provision of loadings and calculations as appropriate.
- c) Lift landing entrance plans and elevations including doors, architraves landing pushbutton and indicator stations, notices, all engraving on stations, all finishes including walls and floor.
- d) Drawings of the lift car operating panel including all engraving.
- e) Lift car interior perspective drawings of the car finishes, including the lighting, flooring, lift car front walls and doors shall be provided.
- f) Details of the drive unit and brake including certification.
- g) Detailed drawings of the car frame including any pulleys, safety gear and suspension points.
- h) Details and certification of unintended and uncontrolled movement devices.
- i) Detailed drawings of the lift car construction, isolation and car body.
- j) Drawings of car and landing doors including door frame architraves, door operator, tracks, rollers and running equipment.
- k) Details of components such as electro-mechanical locks, guide fixings, buffers, limit switches, etc.
- l) Complete wiring diagrams – prepared for easy identification with circuits clearly arranged with full nomenclature of terminals, switches, contactors, etc., corresponding to the labels fixed to the control panel, etc.

### **3.5.3 Existing Equipment**

#### **3.5.3.1**

The contractor shall include for removal and disposal of all the existing lift equipment including all redundant lift parts on site. With the exception of at Albion Towers where the landing stations and their associated buttons, indicators, etc., are to be retained. The car operating panel equipment, i.e. buttons, indicators, etc., at Albion Towers are also to be retained with the equipment mounted in the new car operating panels.

#### **3.5.3.2**

The contractor shall retain all salvage rights for the materials and equipment removed. The contractor should reflect any savings associated with this in their tender.

- 3.5.3.3 Any damage caused to the building structure or environment by the removal of the existing lift equipment shall be restored to original condition
- 3.5.3.4 Any redundant holes left by the removal of the existing lift equipment shall be filled and made good to blend into the surrounding area and restored the fire rating of the walls, floors, doors, etc.
- In addition, all holes and other openings through walls to be made good with certified intumescent fire stopping, this includes any temporary openings overnight.
- Concrete repairs and the filling in of redundant holes shall be done using a suitable concrete material. All repairs to concrete reinforcement materials are to be in accordance with industry standards.
- 3.5.3.5 Landing entrance walls shall be restored to match surroundings and repainted in matching paint to the nearest wall
- 3.5.3.6 The floor in front of each lift landing entrance is to be reinstated following the installation of the new lift landing door frame assembly.
- 3.5.3.7 Prior to the commencement of any works the contractor shall photograph all work areas to establish as a contract record any pre-existing damage and the condition of the areas being worked in, the photographs are to be issued to the CA on a clearly labelled CD.
- 3.5.3.8 Any oil leakage or spillage from the existing equipment shall be removed and fully cleaned up prior to any painting. All oil contaminated waste must be disposed of via registered contractors.
- 3.5.3.9 Any area affected by removal of the equipment must be restored to original condition.
- 3.5.3.10 Any contaminated waste must be disposed of via registered contractors with all the paperwork issued to the CA.

### **3.5.4 Lift shaft**

- 3.5.4.1 Any existing diverter steels at the top of the lift shaft may be left in place but shall not be used for lifting unless they are tested, marked and their certification is current.
- 3.5.4.2 The contractor is to ensure that all lifting beam(s) are tested and marked and that their certification is current for the duration of the contract.
- 3.5.4.3 After the removal of the existing lift equipment and prior to any new lift installation works the lift shaft shall be degreased and cleaned. A minimum of 2 coats of white masonry paint shall be applied to walls to give full coverage; this shall be done before any new fixings are applied to the walls.
- 3.5.4.4 Lift pit shall be fully degreased, cleaned and painted with a minimum of two coats of light (dove) grey floor paint to give full coverage over the whole pit base and 500mm up the walls.
- 3.5.4.5 Any marks or stains shall be over-painted prior to completion of the works to the satisfaction of the CA.



3.5.4.6 On completion of the works the entire lift must be free of construction dirt and dust and fully cleaned including the inside light fittings and trunking runs, push stations control panels, etc.

### 3.5.5 Machine Room

3.5.5.1 Lifting beam(s) in lift machine rooms shall not be used unless they are marked and their certification is current.

3.5.5.2 The contractor is to ensure that the lifting beam(s) are tested and marked and that their certification is current for the duration of the contract.

3.5.5.3 The machine room walls and ceiling at Albion Towers and Shirley Towers have had polystyrene applied for insulation, this has partly been removed at both sites. The contractor shall include within their tender to remove all the remaining polystyrene insulation, including from behind any existing control gear, and replace with an insulated and fire rated lining achieving a maximum U-Value of 0.30W/M<sup>2</sup>K. Suggested construction: 65mm Celotex insulation board with a fire rated plasterboard covering. The suggested method of fixing is by using the dabbed and dobbed technique with joints taped and surface skimmed. The Contractor shall seal all joints, seal and painting the machine room walls and ceilings prior to applying 2 coats of white masonry paint.

Approximate machine room dimensions

Albion Towers: 7000mm wide x 4450mm deep x 2300mm high  
Shirley Towers: 7050mm wide x 4450mm deep x 2300mm high

3.5.5.4 Machine room floors shall be thoroughly degreased, cleaned then painted with a minimum of two coats of slip-resistant light grey floor paint.

3.5.5.5 The contractor shall supply and install new temperature controlled forced high level air extraction and low level air introduction on the wall of the machine room. This shall be controlled by a digital thermostat set to activate at 25°C fed from a dedicated circuit in the consumer unit.

3.5.5.6 The contractor shall supply and install sufficient wall mounted induction heaters controlled via a digital thermostat set to activate at 8°C fed from a dedicated circuit in the single phase distribution board.

3.5.5.7 Personnel access to the lift machine rooms is from the top floor through security doors, stairs and permanent ladders up to the lift machine room.

All access ladders are to be checked for wear, corrosion and compliance to current regulations and if necessary replaced with new.

3.5.5.8 The existing machine room doors and frames are to be refurbished or replaced, with new door furniture fitted including a new high security keypad fitted on the outside (the existing code is to be used for the new keypad) The machine room door must be capable of being unlocked from the inside without the need for a key (a turnbuckle release should be provided).

3.5.5.9 An intruder alarm is to be installed in the lift machine room in accordance with the requirements of BS EN 81-71 for category 2 vandal resistant lifts. In addition to the alarm sounder for the lift machine room, a repeater alarm and light is to be fitted at the main entrance lobby.

- 3.5.5.10 The existing lift equipment access hatches up from the top floor lift landing lobby may be used. The contractor is to ensure that these are a suitable size for the equipment and enlarge it as necessary. Suitable guarding, barrier rails are to be provided. A tested and marked lifting eye is to be fitted over the equipment access hatch.  
The contractor may propose an alternative method for getting the equipment in and out. Details of any alternatives are to be provided as a part of the tender submission with all costs indicated.

### **3.5.6 Control Panel**

- 3.5.6.1 The Contractor shall allow for the supply, delivery, installation and commissioning of a Kollmorgen MPK 411 VVVF Green floor mounted duplexed control panel fitted with LSF wiring, Uni-trailer travelling flexes (LSF), closed loop motor, half way termination box for the car top, inductors, floor zone plates and all other required associated equipment.
- 3.5.6.2 The floor mounted control panels are to have a steel enclosure and forced ventilation provided by means of a fan and filter arrangement. The control equipment and connections shall be accessed from the front only by means of four point hinged key lockable doors complete with dust seals.  
Access to equipment or connections by other means (i.e. access panels, rear doors, etc.) will not be accepted.  
  
Control panels shall be sat on a 200mm plinth to allow cables to be routed into the panels neatly.
- 3.5.6.3 The controller shall be programmed to power down in phases to conserve electricity items such as car lights & indicators. Functions such as re-leveling shall not be effected.
- 3.5.6.4 A TCP/IP remote monitoring interface is to be provided to enable the control system to be connected via the local network to the council's VisualLift remote monitoring system.
- 3.5.6.5 A flush mounted version of the position indicator station specified for the landings shall be mounted above each control panel so that lift movement can be monitored easily from the lift machine room.
- 3.5.6.6 The contractor shall clearly neatly stencil in 38mm high black letters the word 'LIFT' followed by the SCC 4 digit number on top right outside of the lift controller door.

### **3.5.7 Microprocessor Based Control System**

- 3.5.7.1 The control system shall be of a dedicated design using the microprocessor based MPK 411 lift control system manufactured by Kollmorgen Steuerungstechnik GmbH.  
Parameter configuration, operational status and diagnosis shall be via the directly connected (Ethernet) or WLAN connected CHT – Control Hand Terminal.  
Both Ethernet and WLAN connection options are to be provided.  
  
The CHT has a browser based menu structure with intuitive navigation via a 4.3 inch touchscreen.

Each control panel shall be capable of controlling each individual lift.

- 3.5.7.2 Control system and motor control parameters shall be adjustable from within the lift car using the 'CHT handheld terminal connected to a socket located in the car interface module or behind the car operating panel.
- 3.5.7.3 Labels shall be used to identify all contactors, relays, solenoids, rectifiers and other discrete equipment within the control panel.
- 3.5.7.4 An electronic phase failure and reversal device shall be incorporated within the control system as standard.
- 3.5.7.5 Floor positional information shall be provided by Kollmorgen shaft encoding system, termed "DSK" utilising the motor encoder, in conjunction with Kollmorgen "TM10" card, to provide a "no-encoder-in-the-shaft" solution. The system shall digitally close the loop between the lift car and the control system.
- 3.5.7.6 The controller shall incorporate a suitable overload device to isolate and disconnect the supply to the motor should an overload occur, due to a short circuit or brake failure, etc.
- 3.5.7.7 The door operator shall give suitable operation of the lift doors as follows:-
- Incorporated within the controller should be means to alter the door timing delay.
  - When the lift arrives at a predetermined floor, the doors shall open automatically. If the lift has no committed direction (i.e. no calls registered), priority shall be given to car calls for a predetermined period (approximately 5 seconds).
  - If during this period no car calls are registered, the doors shall automatically close.
  - Operation of the door protection device or the door open button in the lift car during the closing cycle shall cause the doors to reverse and open automatically.
- 3.5.7.8 Operation of a car call button shall cause the lift to travel to the appropriate level. Any subsequent car calls entered shall cause the doors to close and the lift to travel to the desired level.
- 3.5.7.9 Lift car will be supplied with a car preference key switch and when in the 'ON' position, the lift shall respond to car calls only. All other operations shall be ignored.
- 3.5.7.10 When operating under independent service, the lift shall park with doors open.
- 3.5.7.11 A "Lift Out Of Service" indicator shall be illuminated under the following conditions:
- Lift under Fire Control
  - Lift under Independent Service Control
  - Lift under Test Control/Maintenance
  - Lift Switched "OFF" on main isolator switch.

3.5.7.12 The various circuit supply voltages shall be as follows:

Power Supply:	400Vac, 3 -phase, 50 Hz, 4-wire
Limits and Safety Circuits	240V AC
Pushbuttons	24V DC
Indicators	24V DC
Brake voltage (typically)	185V DC

3.5.7.13 The controller shall be provided with suitable fuse or miniature circuit breaker protection to ensure that circuits affecting all electrical equipment are suitably protected against short circuit, overload and/or reverse current.

3.5.7.14 The controller shall incorporate logic design to provide full isolation of the control circuit and removal of power from the brake solenoid coil, thus bringing the lift car to rest and applying the brake upon occurrence of:-

- Total power failure
- Detection of phase failure or reversal
- Operation of any of the electrical safety devices.

3.5.7.15 All external signals shall be sourced from 240V AC supply. Each input signal shall be optically isolated and suitably filtered before being applied to the microprocessor.

3.5.7.16 The input / output structure of the controller shall be freely programmable, with the option to increase the capability by the introduction of further input / output modules if required.

3.5.7.17 The microprocessor shall be capable of working in a machine room ambient temperature of up to and including 40°C. In addition (as part of Kollmorgen MPK 411 design and test specification), the controller will also be capable of withstanding higher operational ambient temperatures, up to and including 55°C.

3.5.7.18 All printed circuit boards shall be thoroughly tested before leaving the manufacturer's factory and shall be so designed and labelled as to prevent incorrect insertion and / or misconnection.

3.5.7.19 Where it is safe to do so. Faults shall be set to isolate at next floor, rather than interrupt and block, and thereby trap passengers.

### 3.5.8 Control Cabinets

3.5.8.1 Lift control cabinet shall be floor mounted, totally enclosed ventilated sheet steel construction of the switchboard type in conformity with the requirements of EN81. Control cabinet should also be fitted with hinged lockable front door cover. The respective main isolator (AC 23 category) shall be sited adjacent to the control panel (for maintenance purposes).

3.5.8.2 Control cabinets shall be of neat painted finish free from scratches. Any damage caused from installation or works shall be rectified prior to handover.

3.5.8.3 Electrical interlocking shall be provided as necessary to ensure that the relays and contactors operate in a proper sequence. Relays, contactors and

safety switching devices shall comply with the appropriate British Standard and the conditions for use of electric safety devices.

- 3.5.8.4 Control cabinet shall be complete with an internally mounted wiring diagram(s) single sided, laminated and bound in A3 size.
- 3.5.8.5 The control system shall be such that the acceleration and retardation of the cars in conjunction with the action of the brakes shall be smoothly performed without discomfort to passengers. Additionally, acceleration, deceleration & jerk limits will be adjustable within the internally-mounted drive system, to ensure that specified maximum limits of these variables are not exceeded.
- 3.5.8.6 Phase failure and reversal relay shall be fitted in each control unit, arranged to disconnect the power supply to the motor in the event of one or two of the phases being reversed.
- 3.5.8.7 The supply for all control circuits (and in the case of traction lifts: - brake circuits) is to be direct current (dc) at low voltage, obtained through a double wound, transformer with earthed screen and full wave rectifier.
- 3.5.8.8 The transformer and rectifier units are to be continuously rated for the maximum load they shall be called upon to deliver. Unless otherwise compensated, the secondary side of the transformer shall be provided with  $\pm 5\%$  voltage taps to compensate for rectifier ageing. The negative terminal shall be connected to earth through a removable bolted link.
- 3.5.8.9 An “HRC” fuse in the live supply line shall protect the primary winding of the transformer.
- 3.5.8.10 The DC control circuit shall be protected by a single-pole miniature circuit breaker of the electro-magnetic type, giving instantaneous overload protection with a current of 50% above its full load rating, and have a free handle with clear indication of whether the circuit is open or closed.
- 3.5.8.11 All metal to metal contacts on contactors shall be of the “double-break” type.
- 3.5.8.12 A changeover device shall be incorporated within the control system, connected to the maintenance control station on top of the car. This changeover device shall be clearly labelled “NORMAL / INSPECTION”, and when switched to the “INSPECTION” position shall transfer the operational control of the lift solely to the maintenance control within the control panel.
- 3.5.8.13 The running speed of the car under inspection control conditions shall not exceed 0.63 m/s and a terminal stop switch associated with this control shall be fitted to stop the car when travelling in an upward direction (with its roof 1.8 m from lowest part of the shaft ceiling - hazard).
- 3.5.8.14 Upon resetting the changeover device to the `NORMAL' position, the lifts shall return to normal operation with car control push buttons and all landing call push buttons becoming fully operative.
- 3.5.8.15 Equipment within control cabinets shall be so positioned as to permit adjustment and inspection of all components from the front of the panel.
- 3.5.8.16 All wiring connections within control cabinets shall use ferrells. Additionally, equipment within the control cabinet shall be provided with labels to indicate their function, with a reference corresponding with the appropriate wiring diagram.

3.5.8.17 All external connections to the control system shall be via a terminal connector within the control cabinet. Direct connections to components within the control cabinet will not be accepted.

### **3.5.9 VVVF Vector Drive Motor Control**

3.5.9.1 The AC-VVVF motor control shall be of the field-orientated flux vector drive type Ziehl-Abegg ZETADYN4. This drive type shall be capable of modelling the motor's characteristics utilising DCP4 control requiring minimal manual tuning by the Lift Installation Engineer. The vector drive will incorporate a display with keypads.

3.5.9.2 The inverter section shall be controlled by a dedicated signal / torque / flux-control processing section.

3.5.9.3 All external connections to the control system shall be via a terminal connector within the control cabinet. Direct connections to components within the control cabinet will not be accepted.

3.5.9.4 A Ziehl Abegg ZETAPAD external operating terminal with data cable and integrated card slot shall be provided for each lift as means of access to the ZETADYN4 frequency inverter.

3.5.9.5 The drive shall provide dynamic braking by absorbing the regenerative energy of the lift into the drive's DC bus circuit.

3.5.9.6 For higher levels of regenerative energy, this energy shall be absorbed by dynamic braking resistors switched through an internal dynamic braking module.

3.5.9.7 The drive shall regulate stator current, phase and magnitude with respect to the rotational position of the rotor, ensuring that the stator field is always orientated to the rotor field.

3.5.9.8 The drive shall exhibit independent control of the torque and flux components of the motor and thus provide fast torque response and zero speed holding with full torque capability at zero mechanical speed.

### **3.5.10 Ropes**

3.5.10.1 The main lifting ropes shall be Pfeifer Drako 300T steel lift ropes, minimum size 13mm. The termination method for the ropes shall be "Asymmetric Wedge Socket". Rope certificates shall be provided as part of the O&M manual upon completion.

3.5.10.2 Exact size and number of ropes shall be confirmed by the lift contractor who shall ensure there is suitable friction under emergency conditions that slippage and wear is minimal and compliant with BS EN81.

3.5.10.3 Rope clamps shall be fitted to both ends of ropes, which shall not touch and must remain in a single plane through their entire length. Max fleet with lift at terminal floors shall be 20mm.

3.5.10.4 The overspeed governor rope shall be Pfeifer Drako 250T and at least 6.5mm diameter. All associated equipment (i.e. DIN grips and connections for the car safety gear linkage assembly) is to be included. Certificates for the overspeed governor rope shall be supplied to the CA on completion as part of the O&M manual.

3.5.10.5 Rope calculations are based on theoretical values. It shall be the responsibility of the contractor to ensure that the final motor / rope details are correct for the application. Calculations to prove this shall be provided to the CA for approval prior to manufacture. Alteration of rope sizes / quantity shall only be permitted via agreement with the CA.

### **3.5.11 Load Weighing**

3.5.11.1 A Micelect Load-weighing device ILC3 shall be fitted to the ropes near to the car top termination point. The device shall be able to supply information to the control panel to remove the lifts from service if overloaded, and when the lift car is loaded to approx 90% of the lift car rated load it shall by-pass all other registered landing calls. The device shall utilise Rope Load-weighing technology, and change states with a maximum change in load of 75Kg. This system shall be demonstrated to the CA at the same time as the witness testing is being performed.

### **3.5.12 Rope Lubrication**

3.5.12.1 A system to provide automatic lubrication for the main lifting ropes is to be provided. This is to be a contact free system in the form of an oil reservoir located in the machine room near to the ropes with an oil absorbent transfer pad set to within 1mm of the moving ropes. The automatic lubricator only needs to be in place for approximately 1 hour every 3 months (depending on site conditions) so is to form a part of the planned preventative maintenance cycle.

3.5.12.2 When not in use, the automatic rope lubricator is to be moved away from the ropes to prevent excessive lubricant being applied to the ropes.

3.5.12.3 The machine guards are to be designed so that the automatic rope lubricator can be accessed, adjusted and filled with lubricant without the need for the complete guard to be removed.

3.5.12.4 The lubricant used must be specific for this application and in accordance with the rope manufacturer's requirements.

3.5.12.5 Information on the lubricant properties, use, risk to health (COSHH), etc. is to be included in the O&M manual.

### **3.5.13 Machine**

3.5.13.1 The machine shall be a Ziehl-Abegg ZAtop SM250-80D permanent magnet synchronous AC gearless unit suitably sized for the rated load and speed with capacity.

The motor characteristics shall be specifically applicable for lift usage. A screen protected enclosure shall be provided in accordance with IP2X.

3.5.13.2 The machine will incorporate a traction sheave that is a minimum of 40 times the diameter of the traction ropes. The sheave material and groove profile should be selected for minimal wear to both drive sheave and ropes.

3.5.13.3 Brakes shall be certified against uncontrolled and unintended car movement tested with monitoring switches linked to the lift control system.

3.5.13.4 The machine will facilitate hand operated brake release mechanisms for use only in the event of failure of the electrically operated brake release device. Brake handle shall be painted red, shaped to ensure ease of operation from

a standing position next to the machine and removable. Handles shall be labelled to indicate they should only be used once all power has been isolated.

3.5.13.5 The motor shall be fitted with forced motor cooling / ventilation in the form of a separate, thermostatically controlled fan. And shall be capable of a continuous duty cycle of 240 starts per hour.

3.5.13.6 An encoder shall be provided for direct closed loop feedback to the drive for optimum travel comfort and positioning.

3.5.13.7 The machine will be sited on manufactured steel support frames with one integral diverter sheave, designed to provide in excess of 150° of wrap, and to provide the maximum headroom above the machine possible. The steel frame will be totally housed within the lift machine room.

3.5.13.8 All sheaves used in the installation shall be of metal or plastic construction and a minimum size of 40 times the rope diameter.

3.5.13.9 Under no circumstance will the diverter sheave be sited below the machine room floor slab.

3.5.13.10 Isolation shall be provided between the machine bed and the slab and be secured to both the slab and the bed via suitable fixings.

- Drive unit : Ziehl Abegg ZAtop SM250.80B(Nominal)
- Brake : 207vdc unit with manual override
- Ropes : Number to be confirmed by contractor Pfeifer Drako 300T 13mm (nominal)
- Lift Speed : 1.6m/s
- Rated Load : *(to suit individual sites/lifts – contractor to confirm)*
- Drive ratio : 1:1
- Counterweight : 50% balanced
- Starts / Hour : 240

3.5.13.11 Motor and rope calculations are based on theoretical values. It shall be the responsibility of the contractor to ensure that the final motor / rope details are correct for the application. Calculations to prove this shall be provided to the CA prior to manufacture.

3.5.13.12 All other relevant information, data sheets, shall be obtained from Ziehl-Abegg UK Limited. Springfield Business Park, Lonebarn Link, Unit 1, Chelmsford, Essex, CM2 5AR. www.ziehl-abegg.co.uk. Phone 01245 449010.

3.5.13.13 All rotating parts shall be guarded against finger traps by purpose-made powder coated punched sheet guards conforming to the latest regulations.



3.5.13.14 All guards shall be fixed and secured in place using wing nut type fixings.

3.5.13.15 Stop switches for each lift must be fitted within reach of the motor unit and the entrance door to the machine room.

### **3.5.14 Emergency Manual Operation**

3.5.14.1 Emergency manual operation shall be possible with the brake manually released and the car loaded within the limits defined in BS EN 81-20 clause 5.9.2.2.2.9 to move the car to an adjacent floor by natural movement due to gravity.

The contractor shall provide as a part of their design, the measures included to provide emergency manual operation.

The contractor shall demonstrate to the CA as a part of the witness testing emergency manual operation.

### **3.5.15 EMC Related Issues**

3.5.15.1 Certification and proof of compliance with EC Directive for EMC compliance and all necessary precautions shall be taken with regards to Radio Frequency Interference.

3.5.15.2 Note. Equipment that does not meet the foregoing criteria will not be considered and only fully EMC-compliant drives will be accepted.

### **3.5.16 Overspeed Governor**

3.5.16.1 A Bode Type 7 over-speed governors with incorporated electrical monitoring and anti-creep solenoid are to be fitted. These governors will be bi-directional in operation giving protection against over-speeding lift cars in both up and down directions or uncontrolled movement.

3.5.16.2 The over-speed governor shall be guarded against finger traps by a purpose made powder coated punched sheet steel enclosure fixed and secured in place using wing nut type fixings conforming to latest regulations. The enclosure shall include a hinged lid that can be opened by removing a winged nut to enable the governor to be reset.

3.5.16.3 The over-speed governor return pulley assemblies suitable for the bi-directional safety gear shall be fitted in the lift shaft/pit. These shall include a latching electrical slack rope switch and will be suitable for the safety gears and over-speed governors to be fitted. Tension weights shall have a minimum of 125mm movement before contact with the slack rope switch. The whole assembly shall be protected using powder coated punched sheet steel guards with wing nut fixings for access, maintenance and adjustment.

3.5.16.4 The over-speed governor rope shall be 6.5mm diameter Pfeifer Drako 250T steel cored.  
The Contractor shall include for all associated equipment (i.e. DIN grips and car hitches) for the attachment of the over-speed governor rope. Certificates for the new ropes shall be supplied to the CA on completion as part of the O&M manual.

### **3.5.17 Protection against unintended car movement**

- 3.5.17.1 The lift shall be provided with measures to stop unintended car movement away from the landing with the landing door not in the locked position and the car door not in the closed position in accordance with the requirements of BS EN 81
- 3.5.17.2 The measures used to prevent unintended car movement protection shall be type tested.

### **3.5.18 Emergency Manual Lowering**

- 3.5.18.1 To aid emergency manual lowering and raising, an audible and visual system shall be provided with a control panel positioned in the lift machine room where it can be easily seen when carrying out emergency manual lowering or raising operations.
- 3.5.18.2 The system shall include:
- A control panel with a clear and easy to read display
  - Programmable on site
  - All lift shaft/car equipment securely mounted, wiring to be LSF
  - An ON and OFF facility that when in the ON position interrupts the primary safety circuit.
  - When in the OFF position the display is to be switched off
  - A scrolling arrow on the display indicating the direction of movement
  - Fixed up and down arrows on the display indicating when the lift is at floor level
  - Scrolling alpha numeric lift position displayed (fixed when at floor level)
  - Audible buzzer when at floor level
  - Visual LED at floor level indicator
  - Backup power supply maintained for 3 hours
- 3.5.18.3 Clear site specific operating instructions mounted in a position that can be seen when carrying out manual lowering or raising operations

### **3.5.19 Auto-dialler**

- 3.5.19.1 A LiftStore LX-8 emFONE system complete with stations in the car operating panel (COP), lift machine room, on the car top and in the pit shall be provided for each lift. These shall be wired in screened twisted cables and separated from any power supply cables to prevent noise.
- 3.5.19.2 Alarm filtering to be provided in accordance with clause 4.1.5 of BS EN 81 28 remote alarms on passenger lifts. Where provisions shall be made to enable the alarm system to filter undue alarms when the lift car is in an unlocking zone and the car and landing doors are fully open or when the lift car is running and doors are opening at the next landing stop.

No alarms initiated during maintenance and/or repair shall be discarded.

The alarm system shall also provide means to allow the rescue service to deactivate and reactivate filtering of the alarm. Clear instructions are to be provided on site and in the O&M manual for this function.

- 3.5.19.3 The whole lift communication installation and two way intercom shall be left in full working operation including connection to the SCC remote monitoring station – 023 8063 2622
- 3.5.19.4 The emergency auto dial system shall be programmed to include the SCC Property Services help desk, SCC Out of Hours service and the lift contractors 24 hour manned response service.  
The contractor shall provide an electronic copy of all the programming settings, numbers, etc. prior to completion of the works
- 3.5.19.5 The master unit shall be mounted 1800 mm high next to the controller.
- 3.5.19.6 Where there is more than one lift connected to the master control unit it shall include TE Boards CD-LX/TE to enable each lift to connect individually.
- 3.5.19.7 A telephone socket shall be installed next to the master unit with the cable routed neatly round the machine room on surface mounted cable tray set off the wall on proprietary brackets.
- 3.5.19.8 The 47K $\Omega$  resistor must be connected to the alarm push contacts within the lift car, and not directly to the emFONE unit.
- 3.5.19.9 The lift control panel shall have an input linked to the output relay of the emFONE shall be used to register any fault that has been detected within the system. Upon activation, the following shall happen:
- The lift shall return to the ground floor and park with its doors open
  - All indicator stations shall scroll the 'Lift XXXX Out of Service' message
- 3.5.19.10 An inductive loop shall be built into the system for use by person in the lift car. This shall be in the form of a self-contained unit positioned inside the lift car operating panel.
- 3.5.19.11 The operation of the inductive loop shall be demonstrated to the CA
- 3.5.19.12 The COP shall be engraved with the appropriate inductive loop symbol.

### **3.5.20 Guide Rails**

- 3.5.20.1 To ensure clearance for the guide rollers and safety gear the guides shall be T90/B or T125/B planed rails. T125/B are to be used for the lift car guides and T90/ guide rails to be used for the counterweight if suitable.
- 3.5.20.2 The rails shall be fully cleaned and degreased, prior to installation.
- 3.5.20.3 Guides shall be boned and plumbed to ensure the distant between guides (D.B.G) at guide support pitches is consistent to  $\pm 1$ mm and guides are boned to  $\pm 1$ mm.
- 3.5.20.4 A minimum of 25mm clearance is to be maintained between the soffit of the lift shaft (underside of lift machine room slab) and the top end of each guide rail run.

- 3.5.20.5 Consistency of DBG shall be demonstrated to the CA using a proprietary gauge. Method of boning guides shall be agreed prior to commencing and witnessed by the CA.
- 3.5.20.6 Guide support brackets must be adjustable to ensure the guides can be boned without the need for shims.
- 3.5.20.7 Full size trouser shims may be used for plumbing the guides, once boned.
- 3.5.20.8 Guide shall be fitted to a plank channel in the lift pit also used for supporting the buffers.
- 3.5.20.9 A guide support to the shaft walls shall be set no more than 500mm from the ends of the guides.
- 3.5.20.10 Intermediate supports must be set at pitches of less than 2500mm.
- 3.5.20.11 All guide support brackets shall be painted black.

### **3.5.21 Shaft Signals**

- 3.5.21.1 All lift shaft signal support brackets shall be painted black.
- 3.5.21.2 No switch shall be visible through running clearance on side of lift car.
- 3.5.21.3 All magnet plates shall be supported via two channels.
- 3.5.21.4 Limit switches shall be Kronenberg, with the top inspection switch set so that the platform stops 1.8m from the top of the shaft.
- 3.5.21.5 Metal Adaptaflex may be used between movable limits/switches and switches but must not exceed 300mm in length. End terminations must be used to ensure conductivity.

### **3.5.22 Lift Sling**

- 3.5.22.1 The car sling shall be a new heavy duty sling specifically designed for the application, Sling shall include diagonal front and rear cross braces, and have adaptor plates to accommodate the safety gear and the guide rollers. Sling shall be provided by Propbrook Ltd. 389 Lichfield Road, Aston, Birmingham B6 7SS. Phone :0121 327 7909
- 3.5.22.2 Below the sling shall be mounted a bi-directional safety gear. The safety gear and tension weight shall be from the VG range and be provided by Atwell International Ltd, Ball Mill Top Business Park, Hallow, Worcester WR2 6PD
- 3.5.22.3 Car sling shall feature ELSCO Model B Moderate speed Roller guides. They shall be set to 3mm maximum combined movement at the tightest point in DBG. They are available from Elevator Safety Company, 11403 Cronridge Drive, Owings Mills, MD 21117. Phone: (410)363-9020 Fax: (410)363-9695 [www.elscoguides.com](http://www.elscoguides.com) or Atwell International.
- 3.5.22.4 Purpose made orange powder coated punched sheet steel guards shall be fitted to car top rollers. Guards shall be retained using wing nut type fixings to allow adjustment of rollers.
- 3.5.22.5 Lift cars shall be statically balanced to ensure the rollers are evenly loaded.

### 3.5.23 Lift Cabin Design

- 3.5.23.1 The lift car shall be a heavy duty anti vandal design in compliance with BS EN81-70 and EN81-71 provided by Propbrook Ltd. 389 Lichfield Road, Aston, Birmingham, B6 7SS. Phone: 0121 327 7909.
- 3.5.23.2 The internal lift car dimensions shall be as per the new lift particulars x 2150mm high minimum (2200mm preferred) to underside of ceiling. Only handrails and the car operating panel may encroach on this space.
- 3.5.23.3 The clear door opening shall be 800mm wide x 2000mm high. The front wall door opening returns shall be 80mm deep.
- 3.5.23.4 Isometric drawings of the lift car interior, labelling all materials and a layout drawing of the COP shall be submitted to the CA for final approval 3 weeks prior to manufacture to ensure the specification has been understood.
- 3.5.23.5 The clear door opening shall match the landing doors.
- 3.5.23.6 The lift car walls shall be formed from 1.6mm galvanised sheet panels a maximum of 400mm wide, bolted at intervals of less than 150mm together. Corners must be formed, and cannot be bolted.
- 3.5.23.7 The removable lift car wall linings shall be 16swg, 316 grade stainless steel as per the finishes schedule in 3.4 and wrapped round 12.5mm thick plywood panels.
- 3.5.23.8 The front wall returns and header shall be 16swg, 316 grade 316 stainless steel as per the finishes schedule in 3.4.
- 3.5.23.9 The rear corner panels shall be 16swg, 316 grade stainless steel as per the finishes schedule in 3.4 and wrapped round 12.5mm thick plywood panels.
- 3.5.23.10 Top and bottom skirting shall be a minimum of 100 mm high, and contain ventilation slots that align with louvers stamped into the car outer wall. Where it is possible to see through these slots the outer car wall shall be painted matt black. The top louvers should be sloped up, the bottom sloped down
- 3.5.23.11 No fixings of any kind shall be accessible for any of the car interior panel or trims from inside the cabin. Removal of top skirting shall allow panels to be moved vertically to remove them from the car walls. The top rear skirting shall be in 3 sections to enable easy replacement of the mirror.  
A 38mm diameter tubular handrail with ends curved into the walls shall be fixed to the rear wall of the lift cabin below the mirror. For Category 2 lifts, any handrail shall be capable of supporting at its most unfavourable point without deformation a force of 2500N applied in any direction.
- 3.5.23.12 The lift car floor shall be of a rigid and solid metal construction with a 10mm thick deep blue epoxy resin coating for heavy duty use with coved and radiused edges – coved 60mm up the side and rear walls with a nominal 30mm radius to the floor.  
A 300mm square mock-up of a coved corner of the lift car flooring finish is to be provided to the CA – this shall be used to compare the quality of the installed floor.
- 3.5.23.13 Rear wall of lift car shall feature a half height Rimex ‘Super Mirror’ polished stainless steel mirror that shall cover a minimum of 2/3 of the width of the car and be one continuous sheet between above the handrail to the top

stainless steel skirting section. The mirror shall have a 12.5mm plywood backing to prevent deflection and fitted to the rear wall of the car.

The lower part of the rear wall shall be the same finish and construction as the side walls

- 3.5.23.14 All other stainless, such as skirting, trims, COP etc. shall be 316 grade brushed stainless.
- 3.5.23.15 The ceiling shall be 3mm thick 316 grade 180 grit brushed stainless steel punched with multiple holes of varying size up to 30mm diameter to enable maximum light penetration while offering the fire retardant white macrolon lens impact protection. The macrolon lens shall be a minimum of 4mm thick
- 3.5.23.16 The ceiling shall have machined and tapped holes prepared for the addition of two Dallmeier DDF4220HDV recessed Picodome network cameras. One to be set adjacent to the slam post, the other diagonally opposed.
- 3.5.23.17 Car lighting shall be LED mounted in the ceiling void in sufficient quantity to provide a minimum of 100lux at the darkest point at floor level within the lift car, with the car doors closed. Access to the light fittings shall be by removing two panels mounted on the lift car roof.
- 3.5.23.18 Lights shall be wired in two groups so that lift cabin lighting can run at Off, 50% & 100% via the MPK green settings.
- 3.5.23.19 Light relays shall be wired so that they are energised when the lights are off.
- 3.5.23.20 The emergency light shall be a separate self-contained LED unit capable of providing an minimum intensity of at least 5lux for 3hours wired to the live side of the lighting control relays in the car top box so that it only illuminates when the mains power is disconnected.
- 3.5.23.21 The lift car door panels shall be similar in construction and strength to the landing doors and wrapped in 16swg 316 grade stainless steel as per the finishes schedule in 3.4.
- 3.5.23.22 Door detection system – Mounted on supports steels on the outside of the door tracks shall be Memco Pana40+ 2D edges, connected directly to the Kollmorgen controller via a 840 Pana40+ 2D controller set to 194 beams. The broken beam buzzer shall be enabled. The Memco door edges shall be fixed via screws, not friction clips. All cables shall be retained by nylon 'P' clips.

### **3.5.24 Lift Cabin Door Operator**

- 3.5.24.1 The car door operator shall match the landing door assemblies. They shall be robustly mounted so that they do not flex when operating and protected so they cannot be damaged by lift maintenance personnel stepping onto it from the cabin roof
- 3.5.24.2 The car door operating mechanism shall be heavy duty and vandal resistant to meet the requirement of Category 2 doors as defined in BS EN 81-71 high performance door operator with vector control, self-learning with adjustable door obstruction reversal, test switches for open, close, nudging and speed zone set up. Hand-held keypad for programming.
- 3.5.24.3 Door Hangers – Heavy gauge steel cold rolled formed track and large diameter re-enforced nylon resin rollers with sealed ball bearing sheave rollers mounted in a substantial steel assembly fitted with safety retainers to

prevent door panel displacement in the event of roller failure and bolted to the top of the car door.

Hanger assemblies should come complete with track, sheaves, header plate, operator support angle and all mounting hardware.

- 3.5.24.4 The car door track shall be extruded aluminium and mounted on a substantial hot dip galvanized gusseted steel angle sill bolted to the car floor sub frame
- 3.5.24.5 The lift car and landing doors are to be set up so that the landing door pick up rollers fully engage the lift car skate (to at least 50%) and that there is sufficient running clearance between the car skate and the landing header
- 3.5.24.6 The minimum running clearance distance between the landing door pick up rollers and the back of the car skate shall be 6mm.

### **3.5.25 Lift Cabin Features**

- 3.5.25.1 A voice synthesiser shall be supplied and installed to announce direction of travel, floor levels, door operations and faults. It shall be possible to adjust the sound levels from the controller and lift car.
- 3.5.25.2 Doors shall not move until the movement warning message has played in full.
- 3.5.25.3 Movement messages shall be 'Doors opening stand clear of the doors' & 'Doors closing stand clear of the doors'
- 3.5.25.4 A full height Car Operating Panel shall be installed to comply with BS EN 81-70 and to the current DDA Regulations, and be secured with hidden tamper-proof fixings. The COP shall be constructed of 2mm 316 grade brushed satin finish stainless steel, with a full length heavy duty hinge to one side and opened via a solid bar linkage mounted on the car roof. Internal depth of station shall be 75mm, and the station shall be recessed as far as possible, so not to restrict car internal dimensions more than absolutely necessary.
- 3.5.25.5 The pushbuttons shall be Dewhurst US91-EN Compact 2 with dual-illuminated two colour LED halos (blue with red call accepted). Buttons shall be provided for floors, door open, door close and alarm.
- 3.5.25.6 Door close button shall illuminate when the doors are opening, and door open button shall illuminate when the doors are closing.
- 3.5.25.7 A Dewhurst US91STR2A key-switches (removable both positions) for car preference control shall be provided in the COP with adjacent engraving in 5mm black text 'CAR PREFERENCE', 'ON' and 'OFF'.
- 3.5.25.8 A Dewhurst VRS54H blue digital floor position indicator shall be mounted in the COP and display messages and lift directions as per landing stations with the exception of car priority and fire control messages.
- 3.5.25.9 The COP shall also house the speakers for the voice synthesiser and emFONE. The COP shall be engraved in accordance with EN 81-20 and shall have the lift payload, persons and SCC Lift ID number engraved in 10mm black text. No contractor numbers or details shall be engraved on the COP with the exception of the name or logo.

- 3.5.25.10 The lift shall also be prepared for the fitment of a GDX unit, with 2 off twisted pairs run from the COP to the machine room and labelled GDX1, GDX2, GDX3 & GDX4.
- 3.5.25.11 If required to be fitted the GDX unit shall be free issued by the CA to be fitted and wired to the lift car.
- 3.5.25.12 A DIN rail mounted socket to enable the connection of the Kollmorgen CHT portable diagnostic tool shall be provided inside the COP.
- 3.5.25.13 Emergency telephone engraving shall include inductive loop symbol to the standard emFONE design.
- 3.5.25.14 Dewhurst vandal resistant UL200 LED stainless steel 'Alarm activated' and 'Telephone on line' pictograms shall be set into the COP below the Auto-dialler speaker holes.
- 3.5.25.15 The Contractor shall provide all necessary attendance for installation and commissioning of CCTV and if required the GDX intercoms.
- 3.5.25.16 All wires shall be secured to the car station using welded studs and nylon 'P' clips. Adhesive pads will not be acceptable. No external fixings to be visible.
- 3.5.25.17 Dedicated Low Smoke and Fume (LSF) trailing flexes shall be installed and terminated from the lift car to the lift motor room for the sole use of the emFONE, CCTV & GDX units. They shall run from an agreed location in the machine room that shall be confirmed by the CA to a dedicated earthed metal box on the car roof, and then onto the appropriate devices. The trailing cable must be run separately from the lift control trailing cable and shall not pass through trunking containing any other voltages. In the event that the cable passes other supply cables this must be done at 90 degrees.
- 3.5.25.18 The auto-dialler instructions shall be engraved on the COP. The exact wording shall be agreed prior to fabrication with the CA.
- 3.5.25.19 The anticipated message is :

Press Alarm button for 3 seconds and wait  
to be connected to rescue service.  
Please do not dial 999 via mobile phone.  
Press alarm button again to redial.

- 3.5.25.20 The alarm button shall be illuminated via the auto-dialler battery supply.
- 3.5.25.21 An 110db audible alarm shall be mounted on the car roof that shall sound when the alarm button is pressed. The power supply for the audible alarm shall be battery backed so that the alarm will function in the event of power failure.

### **3.5.26 Car Roofs**

- 3.5.26.1 All cables shall be run in new metal galvanised trunking, attached securely to the lift car top / handrails. The size of the trunking is to include the correct spacing factor. Trunking shall be installed to avoid any tripping hazards to all authorised personnel gaining and working on the lift car top.



- 3.5.26.2 All cables and trunking shall be situated so as to provide minimum disruption to persons working on the car roof, and where possible mounted low level to the handrail 200mm above the lift car roof.
- 3.5.26.3 Steel reinforced adaptor flex may only be run between a fixed object, and an adjustable object such as a reader. Maximum length of adaptor flex shall be 300mm. Ends shall be terminated using metal glands to ensure conductivity.
- 3.5.26.4 Car lights supply must pass through a contactor in the Kollmorgen car top box to enable the lights to be extinguished when the lift is idle for a predetermined period set in the MPK 411 parameters. In the first instance this shall be 15 minutes. Emergency lights shall not activate in this instance, and shall be feed from the supply side of this contactor.
- 3.5.26.5 Car lights are accessed from the car roof by two removable panels, they shall not deflect when stood on and have flush fitting handles and fixings.
- Test switch for emergency light shall be marked and fitted to the car roof in a single gang metal clad surface switch box which shall be engraved with the words 'Emergency light test switch' in a pre-approved position. The switch shall be a secret key switch as manufactured by MK Electrical from the Logic Plus range.
- 3.5.26.6 No items shall be mounted on the standing area of the lift, which shall be flat.
- 3.5.26.7 The car door operator shall be robustly mounted off the car sling so that it does not flex when operating and protected so it cannot be damaged by persons stepping onto it.
- 3.5.26.8 The lift car is required to set up so that the pick-up rollers fully engage the lift car skate and that there is sufficient running clearance between the car skate and the landing header.
- The minimum running clearance distance is 6mm.
- 3.5.26.9 A robust car top handrail arrangement shall be provided to each side and the rear on the roof. Full length handrails shall be fixed to car top & sling to provide full protection at 3 points as per EN 81-20. Handrail height shall be 1100mm unless restricted by over-travels. Handrails shall be rigid in construction, incorporate welded brackets for mounting the car top control mid-point at high level, the Kollmorgen half way box at high level to the rear handrail and the low level trunking. All handrails and their fixing brackets shall be powder coated orange.
- 3.5.26.10 Switches, inductors, etc., shall not be mounted of any handrails, these shall be mounted of purpose made brackets fixed to the car frame.

### **3.5.27 Counterweight**

- 3.5.27.1 The counterweight shall be of a heavy duty construction designed and manufactured using rolled steel sections welded and bolted. Folded steel sections will not be acceptable.
- 3.5.27.2 The counterweight shall be 50% balanced
- 3.5.27.3 Filler weights should be no more than 25Kg each and machined to match the profile of the counterweight frame.

- 3.5.27.4 Counterweight filler weights shall be retained and secured in the counterweight frame using tie bar rods running through all the filler weights.
- 3.5.27.5 The counterweight shall be guided using guide rollers assemblies and shall be ELSCO Model D Roller guides. All rollers shall be set to remain in contact with the rails throughout travel. They are available from Elevator Safety Company, 11403 Cronridge Drive, Owings Mills, MD 21117. Phone: (410)363-9020 Fax: (410)363-9695 www.elscoguides.com
- 3.5.27.6 The rope hitch plate shall allow the terminations to hang free and vertical, and be mounted on the underside of the crown bar so that the terminations are clearly visible. Plate must be a minimum of 25mm thick.
- 3.5.27.7 The counterweight shall be fully cleaned, degreased, primed then painted with a minimum of 2 coats of yellow gloss paint to give full coverage to all visible parts.
- 3.5.27.8 Counterweight hitches shall be asymmetric wedge anchor design
- 3.5.27.9 Rope equalisation springs shall be fitted to the counterweight hitch
- 3.5.27.10 A metal rope gatherer shall be fitted within 1000mm of the anchors.
- 3.5.27.11 The counterweight shall be protected in the pit on 3 sides by orange powder coated punched sheet guards conforming to current regulations. Guards must be equipped with facility to access buffer via removable panels retained via wing nuts.

### **3.5.28 Lift Shaft and Pit**

- 3.5.28.1 Kronenberg electro-mechanical shaft end limit switch assemblies shall be fitted. These switches shall include all mounting brackets and associated equipment to ensure they are rigidly mounted in the lift shaft. All wiring to these switches shall be carried out in LSF wire.
- 3.5.28.2 Permanent lift shaft lighting is to be provided on the basis of achieving 50lux 1m above the car roof and the pit floor with the lift landing doors closed and as detailed in the Electrical Specification.
- 3.5.28.3 The pit floors and walls are to be cleaned, de-greased and painted with light grey slip-resistant floor paint to the level of the ground floor.
- 3.5.28.4 A pit ladder is to be provided for safe access into the pit. A permanently fixed ladder is preferred should layout allow. If not then a removable ladder can be provided  
Fixed ladders are to be positioned on the side wall of the lift shaft at a suitable distance that it would be safe to step on to with suitable handholds.
- 3.5.28.5 In the lift pit there shall be a permanently installed inspection station and clearly marked refuge space.
- 3.5.28.6 Two stop switches are to be provided in the lift pit with one accessible from the refuge space at a maximum of 1000mm above the pit base. The second stop switch shall positioned more than 1400mm above the bottom floor level accessible with the landing door open. Stop switches are to be mounted in a metal clad box and be of the push pull type with green/red flags.

### 3.5.29 Landing Doors

- 3.5.29.1 The landing door operation shall be fully automatic and be certified and suitable for use in an environment where there is a potential for severe acts of vandalism.
- 3.5.29.2 Each landing doors and frame assembly shall be certified to BS EN 81-71 Category 2. Certification shall be provided to demonstrate that the landing door assemblies meet or exceed the test criteria detailed in BS EN81-71 Category 2 prior to starting on site, this shall also be included in the O&M manual.
- 3.5.29.3 Each landing door frame shall be a 4 piece bolted goal post assembly comprising of a steel angle bottom track support, uprights and a header section to support the landing door running gear.  
It shall be possible to move each frame corner in or out of the lift shaft to ensure the whole assembly can be plumbed.
- 3.5.29.4 Door tracks shall be extruded aluminium and mounted on a substantial hot dip galvanized gusseted rolled steel angle or channel support of sufficient rigidity to prevent deformation of the sill when a point load is applied equal to 30% of the payload and forming a part of the landing door frame assembly. Track supports shall be hot dip galvanized with the rest of the door frame either galvanised or powder coated to prevent corrosion.
- 3.5.29.5 Each landing door and frame assembly shall be rated to prevent the passage of fire for 2 hours in accordance with EN81-58 certification shall be provided and included in the O&M manual.  
Intumescent strips are to be included to prevent the passage of hot smoke.
- 3.5.29.6 Landing door hangers shall be heavy gauge steel cold rolled formed track and large diameter re-enforced nylon resin rollers with sealed ball bearing sheave rollers mounted in a substantial steel assembly fitted with safety retainers to prevent door panel displacement in the event of roller failure and bolted to the top of each landing door panel.  
Hanger assemblies should come complete with track, sheaves, header plate, operator support angle and all mounting hardware.
- 3.5.29.7 The landing doors and frames are to be clad in stainless steel as per the finishes schedule in 3.4.  
Individual door panels, door frame uprights and header are to be clad in one continuous sheet with the grain or pattern running in a vertical direction. Only where an upright meet other panels will a joint be permitted, this joint shall be straight, tight, flat and smooth.  
All decorative cladding panels are to be securely bonded flat to its relevant backing panel (door panel, door frame upright, header, etc.).
- 3.5.29.8 Each door frame shall be secured to the building structure above, below and to the sides in accordance with manufactures details to ensure the fire rating.
- 3.5.29.9 The lift shaft front wall shall be suitably fire checked with certified intumescent fire stopping to insure that a 2 hour rating is achieved between the lift shaft and the landing door frame to prevent the spread of fire from the lift landing lobby into the lift shaft.

- 3.5.29.10 Following installation of landing door assemblies the lift shaft front walls, thresholds and floors are to be made good. Walls re-plastered and decorated to match existing, the skirting made good and painted.
- 3.5.29.11 The existing lift landing lobbies floor finish is mostly terrazzo (tiles and in situ laid) with other floors having a vinyl type floor.  
After installation of the lift landing door frames, sills and architraves; the lift landing lobby floors are to be made good and flush the surrounding area by fitting suitable floor tiles in the reveal of the new lift door opening and extending onto the landing lobbies up to any contrasting joint in the terrazzo flooring and extending beyond to where the door reveal architraves finishes along the front wall. Where the existing flooring is vinyl; the same tile should be used. All joints to the existing floor finishes are to be substantial and not present any tripping hazards.  
The type, size and colour of the floor tile is to be agreed with the CA (samples will be required) and is to contrast in colour with the existing floor.
- In addition, all holes and other openings through walls and floors are to be made good with certified intumescent fire stopping, this includes any temporary openings overnight.
- 3.5.29.12 Pushbutton and indicator stations shall not be mounted in the landing door frames.
- 3.5.29.13 All wiring to the landing locks shall be run in solid galvanised trunking.
- 3.5.29.14 The lift car and landing doors are to be set up so that the landing door pick up rollers fully engage the lift car skate (to at least 50%) and that there is sufficient running clearance between the car skate and the landing header. The minimum running clearance distance between the landing door pick up rollers and the back of the car skate shall be 6mm.
- 3.5.29.15 At any floor where the lift is not present, a security system shall prevent opening the landing door with an emergency unlocking key as stated in 5.3.9.3 of EN 81-20 or by using an item as described in Annex E of EN 81-71, unless this system has been de-activated.  
A device to manually activate and de-activate the system shall be provided in the machine room and at the main entrance level. The device shall be clearly marked with a pictogram as shown in Annex C of BS EN 81-71. The pictogram shall also be located adjacent to the lift entrance at the main entry/exit floor of the building in a purpose made station incorporating the manual deactivation device\*  
\* an “Express Drop Type Key” same as that used to initiate the fireman’s switch.
- 3.5.29.16 The shaft side of each landing door shall be white spray paint stencilled the relevant floor number. This identification shall be on the upper 1/3<sup>rd</sup> of the landing door and shall be a minimum of 75mm high.

### **3.5.30 Landing Door Architraves**

- 3.5.30.1 Full door entrance reveal depth landing door frame architraves are to be provided fully wrapped back in no more than 3 single sheets of 1mm coloured stainless steel to match that in the lift car corner panels with all grain in a constant vertical direction.
- 3.5.30.2 The inside corner of the uprights shall feature a 75mm x 75mm chamfer.

- 3.5.30.3 Architraves are to butt up to and fixed to lift landing door frame without reducing the clear door opening.
- 3.5.30.4 Landing architraves must be of a double skin construction with necessary bonding.
- 3.5.30.5 Inside of architraves to be reinforced with galvanised steel sections and fitted with ties set into the walls attached to the architraves then backfilled with concrete.
- 3.5.30.6 Front of architrave shall be secured to the outer shaft wall via proprietary fixings at no more than 200mm centres.
- 3.5.30.7 Foot of each architrave upright shall be bolted to the floor prior to screed being applied to cover the fixings
- 3.5.30.8 Once the architraves have been fitted the lift shaft front walls shall be plastered to conceal the fixings and fully secure the architraves then made good to the floor and wall finishes.

### **3.5.31 Landings**

- 3.5.31.1 All landing call stations shall be vandal-resistant stainless steel flush mounted down collective landing call station that shall be set in the wall adjacent to the entrance with the button set between 900mm and 1100mm. The landing stations shall be constructed from 316 grade 180 grit brushed stainless with 3mm thick front plates and secret front mounted fixings with a purpose made backboxes behind. Pushbuttons shall be Dewhurst US91-EN compact 2 LED dual illumination (blue halo red call accepted) with en-buzz.
- 3.5.31.2 Each landing shall have a dedicated indicator station set between 1800mm and 2500mm with a faceplate to match that of the landing call stations. Indicator shall be a Dewhurst Blue VRS54H. The station shall incorporate secret front fixings and have a purpose made backbox behind. The indicator station shall be set into the wall directly above the landing call station.
- 3.5.31.3 All holes and other openings through walls for landing stations and containment is to be made good with certified intumescent fire stopping, this includes any temporary openings overnight.
- 3.5.31.4 All landing stations shall be manufactured by Dewhurst PLC, Unit 9, Hampton Business Park, Hampton Road West, Feltham, TW13 6DB. The design of the entire landing incorporating pushes and indicators shall be submitted for approval by the CA with the car layout drawings.
- 3.5.31.5 The FSAL landing station shall incorporate a 'No Entry' indicator that shall illuminate when the lift is on fire control as detailed in BS EN 81-73 (clause 5.3.8)
- 3.5.31.6 Each landing station shall have the BS EN 81-73 Prohibition sign (Clause 5.1.3) engraved on it.
- 3.5.31.7 All landing stations shall provide visual and audible indication of call acceptance.
- 3.5.31.8 No logo's or other manufacturers details to be engraved on the landing plates.
- 3.5.31.9 The text 'LIFT XXXX' shall be engraved on the top of the landing push station in text at least 10mm high. (where xxxx is the SCC lift ID number)

3.5.31.10 To assist with reporting a lift defect, all indicator stations shall be programmed to indicate the SCC lift ID number when a landing call stations display messages to clearly indicate the following conditions:

- LIFT xxxx ON FIRE CONTROL
  - *When firemans key switch as been operated*
- LIFT xxxx OVERLOADED
  - *When 100% payload has been exceeded*
- LIFT xxxx OFF FOR MAINTENANCE
  - *When lift on inspection control either from car top or machine room*
- LIFT xxxx ON CAR PREFERENCE
  - *When car priority key switch has been activated*
- LIFT xxxx ON EMERGENCY POWER
  - *When UPS activated.*
- LIFT xxxx OUT OF SERVICE
  - *When lift not in normal service and other message not activated, such as when fire alarm has been activated*

3.5.31.11 In normal use the landing stations must display the following:

- Lift position when cabin static at a floor
- Next direction of travel arrow when call registered and cabin static at a floor.  
This arrow shall be distinctively different to the arrow used for motion.
- Approximate floor position when lift is in motion
- Scrolling direction of travel arrows when lift is in motion

3.5.31.12 It shall be possible at all times to determine nearest floor to lift cabin location.

### **3.5.32 Buffers**

3.5.32.1 The buffers shall be oil filled energy dissipation type buffers. The new buffers shall be type tested and all testing certificates shall be supplied to the CA on completion as part of the O&M manual. Unless agreed via the CA the new hydraulic buffers shall be provided by:

Oleo International Co Ltd  
Grovelands,  
Longford Road  
Exhall,  
Coventry

Warwickshire, CV7 9ND

### **3.5.33 Trunking / Conduit**

3.5.33.1 All trunking, tubing and conduit shall to be steel galvanised.

3.5.33.2 Cable trunking is to be run in straight vertical or horizontal lengths; any necessary changes of direction are to be made using manufactured fittings.

All covers are to be arranged to be removable, except sections of trunking passing through walls, floors, etc. These are to have fixed covers for the thickness of the wall and floor only.

The manufacturer's standard fittings shall be used throughout unless it is not practicable. Where necessary special fittings shall be fabricated utilising the same material and gauge as the manufacturer's trunking and finished to the same standard.

3.5.33.3 Shaft lighting and power shall be in its own dedicated conduit.

3.5.33.4 Where the cable trunking is fixed vertically for a distance of more than 5 metres, the contractor shall supply and install purpose made pin racks to support the cable

3.5.33.5 Where adjustment of an item is necessary such as limits and locks, metal 'adaptaflex' steel reinforced conduit may be used but this must not exceed 300mm in length. Suitable end terminations must be used to ensure conductivity is maintained.

Flexible plastic coated steel shall not be used where a formed elbow could be used.

3.5.33.6 Mechanical joints must always be used to ensure good electrical continuity between connections; spacers must be used to ensure box lids are easily removable.

### **3.5.34 Cables and Wiring**

3.5.34.1 All wiring between the control panel and ancillary equipment shall be identified using a permanent label corresponding to designations on the wiring diagrams.

All cabling external to the control panel shall be 1mm<sup>2</sup> minimum. Where flexible conduit is used a separate earth conductor shall be used and terminated at each end. The wire shall be suitably rated with insulation green/yellow.

All cabling, including trailing cables, shall terminate in the lift control panel in a purpose made terminal block. No halfway points are permitted.

3.5.34.2 All wiring including traveling cables shall use low smoke and fume zero halogen (LSFOH) cables

3.5.34.3 Travelling cables shall have a minimum of 10% spare capacity allowed for in the number of cores available.

The travelling cables shall be anchored on a halfway point in the lift shaft and on the underside of the lift car with purpose made wedge anchorages. Proprietary cable cleats shall also be fitted.

Text on the travelling cable shall be clearly visible.

The cables shall incorporate separate ways for the lift car emFONE, CCTV and GDX systems. With screened twisted pairs for the emFONE and GDX, and Cat5e for the CCTV.

### **3.5.35 Earthing**

- 3.5.35.1 The entire installation is to be earthed to provide equipotential bonding with supplementary bonding present to all metal surfaces using metal straps or braided cable. This includes guide rails, shaft screening, guards, covers, floor plates etc.

### **3.5.36 Shaft Steelwork**

- 3.5.36.1 Any unpainted steelwork must first be treated with rust inhibitor, before being painted with etching primer followed by a minimum of two coats of gloss paint to give full coverage.
- 3.5.36.2 Counterweight, and moving pulleys shall be painted yellow.
- 3.5.36.3 All brackets shall be painted black.
- 3.5.36.4 All guards and screens shall be powder coated orange.
- 3.5.36.5 All guides shall be degreased and painted black except for the blade.

### **3.5.37 Guarding and Screens**

- 3.5.37.1 All rotating parts shall be guarded against finger traps by purpose-made orange powder coated punched sheet guards conforming to the latest regulations.
- 3.5.37.2 Counterweight shall be orange powder coated punched sheet guards conforming to current regulations.
- 3.5.37.3 All guards shall have folded edges and be fixed and secured in place using wing nut type fixings.
- 3.5.37.4 Other components that require guarding are to have purpose made powder coated punched sheet steel enclosures fixed and secured in place using wing nut type fixings conforming to latest regulations and shall include individual access panels with hinged lids as necessary that can be opened by removing a winged nut to enable individual components to be reset and/or maintained without the need to remove the whole guard.
- 3.5.37.5 Lift shaft screens are to be purpose-made orange powder coated punched sheet with folded edges and fixing brackets conforming to the latest regulations.

### **3.5.38 Fire Controls**

- 3.5.38.1 Smoke detectors shall be installed in the machine room and at the top of the lift shaft, as part of the building Fire Alarm system.
- 3.5.38.2 Within the machine room shall be provided a volt free contact for interfacing with the lift controller
- 3.5.38.3 Activation of the fire alarm shall cause the following



- Lift cars shall travel to the FSAL
- Lift doors shall park open
- Lift shall isolate all car and landing calls
- All displays shall scroll warning message

3.5.38.4 Once the alarm has been reset the lift shall automatically return to normal service.

### **3.5.39 Fireman's Switches**

3.5.39.1 A Fireman's switch shall be set into the wall adjacent to the landing door at the FSAL. The switch shall be set a minimum of 1800 mm from FFL

3.5.39.2 The fireman's switch shall be only removable via front secret fixings

3.5.39.3 The fireman switch fitted shall be of the "Express Drop Type Key".

3.5.39.4 Upon activation of either fireman's switch :

- The lift shall return to the ground floor (FSAL) in accordance with EN81-72 5.8.7
- The landing stations shall display a fire control message
- The car station shall continue to display floor position
- The Lift shall not respond to any other calls
- The lift shall then function in accordance with EN 81-72 5.8.8.

3.5.39.5 When the fire service switch is reset the lift shall return to normal operation.

### **3.5.40 Diagnostic Equipment**

3.5.40.1 Provided with the contract and for each lift shall be:

- 1 x Kollmorgen CHT Control Hand terminal
- 1 x ZETAPAD external operating terminal with data cable

3.5.40.2 Sockets to enable the connection of the CHT shall be mounted in the car top station and the C.O.P.

### **3.5.41 Remote Monitoring**

3.5.41.1 Southampton City Council operates and maintains two remote monitoring systems for lifts. It has Visual Lift by Kollmorgen Steuerungstechnik GmbH for monitoring in real time the lift controllers and Communication Centre observer by DesignComm for monitoring the condition of the emergency telephone in accordance with EN 81-28.

3.5.41.2 The lift remote monitoring connection via the TCP/IP interface into the IT infrastructure allows the real time interrogation of the lift system using the VisualLift interface to provide:

- Lift position and status of the lift and all its electrical safety circuits
- Adjustment of control parameters
- Adjustment of lift programme parameters
- Statistical data of lift performance
- Interrogation of the fault log
- Record and store every fault as it occurs

3.5.41.3 The emergency auto-dialler telephone remote monitoring shall record the health of the system and phone line every 3 days. It shall record time and location of every alarm press.

3.5.41.4 The SCC remote monitoring station telephone number is – 02380 632622 and is to be programmed in to the emergency telephone system as the Reporting Telephone Number.

### **3.5.42 CCTV / Network**

3.5.42.1 Adjacent to each lift control panel a live Cat5 network point shall be installed (one for each lift). These network points shall be connected to the building's IT infrastructure each awarded with a fixed IP address for linking of the remote monitoring system.

Each MPK411 IP Gateway shall be connected to the adjacent network point via a patch lead and configured for remote access and monitoring. The patch leads shall be neatly routed avoiding power cables and of a suitable length to avoid excess cable.

3.5.42.2 MAC addresses for each network adapter shall be issued to the CA within 1 week of control system arriving on site.

3.5.42.3 CCTV cameras, PSU and switches shall be supplied and commissioned by The Alarming Company Limited, Standard House, Fareham Heights, Fareham, Hampshire. PO16 8XT.

Each camera requires 1 off Cat5e PoE (Power over Ethernet) IEEE 802.3af cable with RJ45 connectors.

The feeds from each of the lift's 2 camera's shall be mounted on cable trays spaced off the wall, routed neatly round the machine room to a CCTV PSU / switch mounted on the wall at least 1200mm high and powered by a dedicated feed from the consumer unit.

Cabling from the CCTV PSU shall be routed to the CCTV room on the ground floor. They shall be suitably terminated to an agreed location.

3.5.42.4 A further Cat5 cable shall also be run in parallel to the CCTV Cat5 cables for the GDX intercom if required.

3.5.42.5 CCTV, GDX & Fire Alarm cables may pass down the building via the lift shaft. They should be mounted on cable trays spaced off the wall at all times.

### **3.5.43 Tool board**

3.5.43.1 A tool board shall be mounted in the machine room for each lift. Each shall contain the brake release handles, 2 sheave clamps, bulldog clip and pen clip, landing door release keys and any other specialised tools required to maintain, adjust, remove or renew all components fitted.

3.5.43.2 Each tool board shall be clearly marked with the lift 4 digit ID number, have each tool's outline reproduced for ease of identification, include a shelf to enable reports to be filled in by an engineer and be of a suitable size to accommodate everything easily.

3.5.43.3 All tools are to remain on site after practical completion and details of each together with instructions for use are to be included in the operating and maintenance instructions.

### **3.5.44 Notices / Information and Diagrams**

3.5.44.1 All lift machine room major components shall be labelled with engraved notices and all hazards shall be provided with suitable warning notices.

3.5.44.2 The existing Log Book cabinets shall be retained and if necessary relocated depending on the machine room equipment layout so they can be easily accessed.

3.5.44.3 All statutory notices shall be replaced with new, screwed to walls where they are clearly visible to persons first entering the room.

3.5.44.4 All high voltage equipment shall have suitable notices

3.5.44.5 All switches shall be engraved with their function

3.5.44.6 All isolators shall carry the appropriate lift ID.

3.5.44.7 The lift control panel full wiring diagrams shall be encapsulated A3, put in a folder subdivided into sections, i.e. controller, drive, auto-dialler etc., and attached via a chain to the appropriate control panel.

3.5.44.8 Operating and Maintenance manuals shall be provided and stored on a shelf in each lift machine room.

3.5.44.9 A3 copies of the wiring diagrams for all the electrical equipment shall be encapsulated, and incorporated in a folder and chained to the controller.

3.5.44.10 Electrical circuit diagrams for power shall be framed and mounted in each lift machine room adjacent to the DB. A separate manual shall be provided for each individual item.

### **3.5.45 Cleaning Down**

3.5.45.1 Upon completion and before making the lift available for service, it shall have a full deep and sparkle clean down. The lift shaft, lift pit and machine room are to be cleared of all unused materials, all walls floors ceilings made good. All equipment in the lift shaft and machine room is to be cleaned and hovered; including the inside of light fittings, control panels, operating stations, door tracks and electrical trunking.

- 3.5.45.2 Any metal found to be rusting shall be treated with rust inhibitor before being painted with primer followed by a minimum of two top coats to match the existing except where this would reduce its operating efficiency.
- 3.5.45.3 Any fixings, guide clips, etc., found to be rusting are to be replaced with new ones.
- 3.5.45.4 The lift car and landing finishes are to have a full sparkle clean, the lift car floor cleaned and all lift lobby floors cleaned and hoovered in the vicinity of the lift door openings.

### **3.5.46 Testing**

- 3.46.1 Testing shall be carried out in the presence of, and to the full satisfaction of, the competent person appointed by the CA. The Contractor shall provide all necessary test weights and testing equipment. Testing must be carried out by NVQ4 qualified engineers. Serial numbers of the calibrated test instruments used must be listed on the test sheets. Copies of the current calibration certificates for the test instruments used are to be submitted to the CA before practical completion. Typed copies of the test sheets are to be provided to the CA with further copies, electronic and printed, included in the O&M manual documentation.
- 3.46.2 Testing shall carried out in accordance with the requirements of BS EN 81-20 section 6 Examinations and tests before putting into service and BS8486 – 1.
- 3.5.46.5 The contractor shall facilitate whatever additional tests the CA requires. Tests shall as a minimum include:
- Mechanical and electrical door lock tests
  - Safety gear full load down over speed
  - Safety gear empty car up over speed
  - Unintended uncontrolled movement in the up and down direction
  - Calibration of load weighing
  - Alarm and emergency telephone operation
  - Emergency manual operation
  - Door reversal forces
  - Equalisation of rope tensions
  - Indicator operation and voice messages.
  - Functional tests
- 3.5.46.6 Any damage caused by the tests must be made good at the contractor's expense.
- 3.5.46.7 Damage to guide rails may only be dressed by hand. In the event of severe damage to new guide rails by the tests or rectification works the rails shall be either filled or replaced, if so requested by the CA.

3.5.46.8 Any damage caused to the building structure or environment by the installation and testing of the new equipment must be repaired to its original condition by the contractor at their cost.

### **3.5.47 Completion and Handover**

3.5.47.1 All snags identified at any point during the installation shall be completed to the satisfaction of the CA and signed off as complete by the CA once the necessary evidence and /or inspection has been provided / taken place.

3.5.47.2 A full duty cycle test is to be carried out for a 4 hour period without failure. The fault log is to be cleared and the control panel reset at the start of the test.

During the duty cycle period, the following functions are to be carried out and recorded:

- Multiple car and landing calls during the full 4 hour period
- Door operation at each call answered
- Door interruption initiated at 45 minutes and left in place for 1 minute
- Car preference operation at 2 hours with two calls initiated then returned to normal service
- Fireman's switch operation at 2.5 hours
- Lift put onto maintenance control from the lift control panel at 3 hours with up and down movement initiated
- Down collective duplex function checks to be included when the second lift is commissioned.

Any faults that occur during this period are to be logged, rectified, the fault log cleared, the control panel reset and the duty cycle test re started. The contractor shall demonstrate to the CA that the lift duty cycle tests were successful for the full 4 hour duration in the form of a date, time and function report.

3.5.47.3 The contractor shall issue to the CA an EC Declaration of Conformity for the installed lift, this shall also form a part of the maintenance documentation.

3.5.47.4 The CA will issue a Certificate of Practical Completion once all the work is complete and all the necessary documentation is in place.

3.5.47.5 The lift shall not be made available for service until the EC Declaration of Conformity has been issued.

### **3.5.48 Maintenance post completion**

3.5.48.1 The lift shall be maintained by the contractor from handover and for 12 months following the date of the CA's Certificate of Practical Completion in accordance with the requirements of the Lift Callout and Maintenance specification.

3.5.48.2 A 3 part lift shaft entrance barrier is to be provided for short term use when carrying out maintenance activities.

The barrier shall be at least 1100mm high, capable of being erected at an appropriate distance away from the landing threshold or by using integral and adjustable poles up to 2200mm high and be fitted with all relevant safety signage.

When not in use the entrance barrier is to be stored in the lift machine room

### **3.5.49 Documentation**

3.5.49.1 The Contractor shall supply 1 hard paper copy and 2 electronic sets of working instructions (O&M Manuals), maintenance requirements and record information for the whole of the plant covered in this specification prior to practical completion. These manuals shall include:

- A full description of the installation, including controls.
- Schedules of all installed equipment with serial numbers, duties, electrical consumption details and manufacturers' addresses and telephone numbers.
- The updated Project Health & Safety Plan.
- "As installed" drawings, including manufacturing and control panel wiring drawings folded into A4 sized plastic clear folders.
- All Testing and Completion records and certificates.
- Mill certificates for stainless steel
- NICEIC or ECA certificates
- Certification and records for all fire stopping.
- Maintenance requirements, including job descriptions, and recommended frequency of operations.

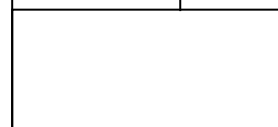
3.5.49.2 The paper copy shall be in a clearly labelled folder, and it's layout shall mimic that of the electronic manuals that shall be fully in Adobe Acrobat, with integral bookmarks and links to enable any person with a PC using Adobe Acrobat reader Version 6 or later to access and print every piece information. Test sheets shall be electronic copies or originals, though scanned signature page must also be included. All scanned information shall be square to the page and clear.

3.5.49.3 Each electronic copy shall be burnt onto a clearly labelled CD.

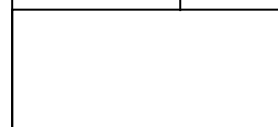
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## Appendix A – Schedule of Materials

The tenderer shall insert in the following table (in ink) the names of the Manufacturers and type/model reference of equipment and materials included within their tender

Where an alternative is proposed to that specified please give justification of compliance with specification and provide technical documents as supporting information for consideration

Upon the tender being successful, the tenderer shall not deviate from the name and type reference in any form without the written consent of the CA.

<b>Specification Reference</b>	<b>Component</b>	<b>Type/model</b>	<b>Manufacturer</b>
3.5.6	Control Panel		
3.5.41	Remote monitoring system		
3.5.7	Microprocessor Based Control System		
3.5.13	Machine		
3.5.10	Ropes		
3.5.10.1	Rope Termination		

3.5.9	VVVF Vector Drive Motor Control		
3.5.14	Emergency Manual Operation		
3.5.16	Overspeed Governor		
3.5.17	Protection against unintended car movement		
3.5.18	Emergency manual lowering		
3.5.19	Auto-dialler		
3.5.20	Guide Rails		
3.5.28.1	Shaft Signals – Limit Switches		
3.5.22	Lift Sling		
3.5.22.2	Safety Gear		
3.5.22.3 & 3.1.27.5	Roller Guide Shoes		

3.5.23	Lift Car		
	Construction		
3.4	Internal Finishes (please list)	<p>Fronts and corners</p> <p>Walls</p> <p>Ceiling</p> <p>Mirror</p> <p>Handrails</p> <p>Skirting trims, COP etc</p> <p>Floor</p> <p>Lighting</p>	
3.5.42.3	CCTV Cameras		
3.5.23.22	Door detection system		
3.5.25.1	Voice Synthesiser		

3.5.25.5 3.5.31.1	Pushbuttons	Car Landings	
3.5.25.8 & 3.5.31.2	Combined lift position, direction and messaging indicator		
3.5.25.14	'Alarm Activated' and 'Telephone on line' pictograms		
3.5.24	Car Door Operator		
3.5.29	Landing Doors		
3.4	Landing door and frame finishes (please list)	Doors Frames	
3.5.31.1	Landing station faceplate		

3.5.30	Architraves		
	Construction		
3.4	Finish (please list)		
3.5.32	Buffers		
3.5.42.1	IP Gateway		

Signed .....

For and on behalf of .....

Date .....