

ESTATES & FACILITIES

Document Title

Standard Lift Specification

Document Number

ES/ 007-E

Revision Index

Revision	Date of Revision	Revised by	Revision made
A	25/11/05	DAG	For review
B	31/1/06	DAG	Issued for use
C	25/5/06	DAG	Up-dated for DDA compliance
D	1/5/07	DAG	Up-dated for stair lifts, platform lifts, fire fighting lifts and general standards update.
E	19-7-11	DAG	Standards Up-Dated

UNIVERSITY OF SOUTHAMPTON

STANDARD LIFT DESIGN BRIEF, FOR M&E DESIGN CONSULTANTS

GENERAL

This specification covers the design for any new lift installation at the University of Southampton. This will include the supply, delivery, erection, fitting, testing and commissioning and consultant witness testing of all equipment and associated materials and plant.

The aim of this design brief is to ensure that all equipment is generic in design and is not special to any lift contractor. This shall ensure that all spares will be supplied by a third party supply chain and not a Lift Contractor and that lifts will be easy maintain.

The work shall be completed, and left in full working order to the satisfaction of the Engineer.

Section 1

APPROVED COMPONENTS AND SUPPLIERS

The following list of components and suppliers is offered to the Contractor as a guide to the preferred specialists who are known to the University. The list has been designed around the ease of maintenance and availability of spares.

At all times, the Lift Contractor will be responsible for the performance and design of equipment offered.

General Guarding

Essex Wire Works
Seagrave Metal Works.

Hoisting Machines

Sassi – (Geared Machines)
Thyssen – (Geared and Gearless Machines)
Leroy Somer – (Gearless Machines)

Motors

Loher
Sassi
Thyssen
Zeihl Abegg

Pulleys & Diverters (Cast Iron Only)

Montinari
Sassi
Thyssen

Door Operators and Door Operating Equipment.

GAL MOVF
Selcom VF (Light Duty Installations only)

Control Systems.

Lester
Liftstore

Shaft Detection Systems.

Tape Head same manufacture as controller.
Lester UPS
Liftstore V-COM

Limit Switches.

Kronemberge FES.

Specialist Finishes [Lift Cars, Entrances &c]

P.H. Jacksons.
Sterling Lift Products.

Push Buttons.

Liftstore US 91 EN.

Indicators.

Red Dotmatrix 50mm Character on the Car and 30mm on the landing.
Lift Store
Stentorgate

Communication Equipment.

Windcrest

Door Detectors

Memco

Pump Units For Hydraulic Lifts.

Bucher with LRV Electronic Valve.

Rams for Hydraulic Lifts.

Bucher

Emergency Communication Systems For Evacuation Lifts and Fire fighting Lifts.

Windcrest

SECTION 2

STANDARDS & REGULATIONS

The installation shall as a minimum conform to the following where applicable together with any amendments or updates: and any other construction related British or European standard.

1. British Standard Specifications series 5655 that are still current.
2. BS EN81 1 & 2 1998 Safety Rules for the construction and installation of lifts.
3. BS EN81-3 2001 Safety Rules for the construction and installation of electric and hydraulic service lifts. (When service Lifts are fitted)
4. PM26 Safety at Lift Landings.
5. The Lift Regulations 1997.
6. BS EN81-70: 2003 - Safety Rules for the construction and installation of lifts – Particular applications for passenger and goods passenger – Accessibility to lifts for persons including persons with disability. (To be complied with in full unless Dimensions do not permit)
7. BSEN81–21: 2009 – New Passenger and goods passenger lifts in existing buildings.
8. BS EN81-28: 2003 - Safety Rules for the construction and installation of lifts – Lifts for the transport of persons and goods – Remote alarm on passenger and goods passenger lifts.
9. BSEN81-30: 2010 – Accessible Goods only lifts.
10. BS EN81-58: 2003 – Safety Rules for the construction and installation of lifts. Examination and tests. Landing doors fire resistance test.
11. BS EN81-71: 2003 - Safety Rules for the construction and installation of lifts. A particular application for passenger and goods passenger lifts. Part 71. Vandal Resistant lifts.
12. BS ISO 4190 Part 1: 1999 - Lift installations Class I, II, III, and VI lifts.
13. BS ISO 4190 Part 2: 2001 – Lift installations Class IV lifts.
14. BS7255:2001 – Safe Working on lifts.
15. BS EN81-72: 2003 – Safety Rules for the construction and installation of lifts – Particular applications for passenger and goods passenger lifts – Part 72 Fire Fighter Lifts. (Where Fire Fighting Lifts are required)
16. BS EN81-73:2005 - Behavior of lifts in the event of a fire.
17. BS 9999:2008 - Code of practice for fire safety in the design, management and the use of buildings.
18. BSEN81- 40: 2008 - Stair lifts and inclined lifting platforms intended for persons with impaired mobility.
19. BS 6440: 1999 – Powered Lifting Platforms for use by disabled persons.
20. BS8486: 2007, Part 1 & 2 – Examination and Test of new lifts before putting into service.

Suitably qualified and competent personnel shall carry out the extent and scope of the works detailed within this specification, proof of competence shall be provided to the engineer upon request.

SECTION 3

GENERAL REQUIREMENTS

GEARED DRIVING MACHINE

Worm & Wheel

The worm shaft and worm shall be machined from a single steel forging and the worm wheel rim shall be centrifugally cast phosphor bronze hobbled to mate perfectly with the worm. The rim shall be bolted to the flange of the sheave shaft in such a manner that the rim can be quickly replaced should this become necessary.

Traction Sheave

The sheave shall be separate, it shall not be integral with its shaft and it shall incorporate a bolted rim.

The sheave diameter shall not be less than 40 times the diameter of the hoisting ropes.

The traction sheave shall have a minimum hardness of Brinell 210. A certificate of test to be provided by the Contractor.

Where the design or positioning of the machine requires a smaller traction sheave to achieve the required angle of wrap, the number of suspension ropes shall be increased to achieve the required traction.

Pedestal Bearing

Where an outboard pedestal bearing is provided it shall be of a proprietary manufacture, and where appropriate, suitably designed for bottom drive arrangement.

Bearings

Bearings must be sleeve or roller type and may be of the sealed-for-life type. All bearings on a common shaft shall be of the same type.

Gear Ratio

The ratio of sheave diameter to worm wheel pitch circle diameter shall not exceed 1.75:1.

Lubrication

The gear oil shall be of the grade recommended by the gear manufacturer and an external oil level gauge shall be provided.

Bedplate and Supporting Steelwork

Where the machine requires a separate bedplate or supporting steelwork it shall be manufactured from standard steelwork sections. The machine supports shall have machined faces. Packing other than fine shimming shall not be accepted and designs for supporting steelwork shall be by proven calculation.

Isolation

Suitable sound isolation to the approval of the Engineer shall be provided to prevent the transmission of noise and vibration from the machine to the building structure. The assembly is to be suitably fixed to prevent any pitching or tilting.

Drilling of Steels

The Lift Contractor shall supply, drill and tap the main supporting and all secondary steels as necessary.

Drip trays

Oil drip trays are to be provided.

Rope Retainers

The main machine and any associated pulleys are to have rope retainers, which shall prevent the main hoisting ropes leaving their respective grooves through rope bounce, &c.

Brake

The brake shall:

Under any normal load and speed conditions, smoothly bring the car to a standstill.

Be mechanically applied and electrically held off.

Sustain static load 25% in excess of contract load.

Have an approved means of mechanical release.

Under operating conditions not be released unless power is applied to the motor.

Incombustible brake linings are to be used and where the linings are not bonded, they shall be riveted with a minimum of 8 copper or soft rivets per shoe, each firmly clenched with the correct form of oversetting tool.

Brake springs, when used, shall be supported and in compression.

Brake linings shall not contain asbestos.

Any device for the adjustment of spring tensioning must be fitted with lock nuts.

The brakes shall be mechanically applied at all times until the hoisting machine is under power.

If the brake shoes do not lift power will be disconnected from the driving machine through an over-torque detection device and if required a brake disconnecting proving switch.

The brake coil terminals shall be fully enclosed.

The bearing surface of the brake coupling shall be formed from a single forging.

Brake Switch

A brake switch shall be installed to the brake. This switch shall prove that the brake has lifted prior to the main drive unit motor being energised. If the brake does not lift the main drive unit motor shall not move the lift.

DIVERTOR PULLEYS

Rope retainers are to be provided to the pulley wheels, which shall prevent the main hoisting ropes leaving their respective grooves, through rope bounce or the application of the safety gear.

Sealed for life roller bearings shall be used.

The diverter pulley shall have a minimum hardness of Brinell 210. A certificate of test is to be provided by the Contractor.

GUIDE RAILS

Substantial Tee section guide rails shall be provided to the car and counterweight, The minimum guide blade thickness shall be 16mm on the car and 9mm on the counterweight.

UNCONTROLLED MOVEMENT OF THE LIFT. (Upward and at landings)

A device shall be provided on the lift stop the lift in the event of any uncontrolled upward movement of the lift.

A device shall also be provided to monitor and prevent any uncontrolled movement of the lift when it is at the landing with the doors open.

VARIABLE FREQUENCY MOTOR

The motor shall be induction AC type incorporating forced ventilation.

The control of the motor shall be achieved, through power transistors, by finite adjustment to the frequency and voltage of an AC power supply through a Pulse Width Modulator incorporating four-quadrant regeneration.

The inverter drive shall meet the harmonic limits laid down in the current Electricity Council Recommendation and must fulfil all radio interference requirements.

The motor and its control shall be compatible to the power supply to the machine room and is to incorporate a sound filter to dampen the Pulse Width Modulator enabling the Lift to run at all loads/speed without appreciable noise or hum.

The motor control shall be by means of either an Open loop up to a contract speed of 0.63 m/s or a Closed Loop System incorporating a speed regulator that must be fully adjustable to give optimum performance throughout the intended travel of the Lift.

The regulator will respond to feedback signals derived from the motor speed, motor voltage, distance to travel and load within the Lift car.

The system is to have an accurately controlled method of controlling rate of change in acceleration. The acceleration shall initially be set at 0.8 mps^2 and it shall be adjustable between 0.8 mps^2 and 1.2 mps^2 .

The motor control shall incorporate direct floor approach and stopping, with the machine brake being applied only after the car is stationary.

The system shall maintain its speed between -2% and +2% of its designed operating speed.

Protection to the motor windings shall be in the form of thermistors with additional protection provided by the inverter should any of the following occur:

1. Over-current in the drive circuit
2. Over-voltage of the intermediate circuit
3. Under-voltage of the intermediate circuit
4. Network voltage asymmetry not correct
5. Temperature rise of the semi-conductor cooling plates
6. Regulator electronic voltages incorrect
7. Operation of the electronic braking network incorrect
8. The speed of regulator becomes saturated

The motor shall bear the actual manufacturers name and data plate. All motor terminals shall be readily accessible and of screw fixed or bolted design located within a terminal box.

Lifting eyes are to be provided to the motor casing.

The motor shall be rated for a Lift duty of 180 starts per hour.

Motor bearings shall be of the roller type.

In the event the driving machine requires site assembly it must be carried out by the manufacturer or approved agent.

The levelling accuracy shall have a tolerance of +/- 3mm.

The tacho-generator or other means of speed reference shall be so sited that easy access is provided and the items are not subject to accidental damage.

In the event of loss of tacho-generator feedback under normal conditions and on car top control the Lift will immediately shut down and the brake will be applied. The Lift will no longer attempt to respond to calls until tacho-feedback has been reinstated.

Where the hand winding wheel is separate from the driving machine, tacho-generators or other feedback encoders shall not be mounted at the motor end of the high-speed shaft necessitating their removal for handwinding purposes.

INSTALLATION WIRING

The contractor shall provide all new wiring from the fused mains disconnecter for the lift installation.

Under no circumstances will it be permitted to run conduits or trunking above floor level in the motor room where this will constitute a tripping hazard.

When floor trunking is used it will lie flush with the floor level and incorporate chequer plate covers, which shall be removable for their entire length.

All cables shall be enclosed throughout their length in heavy gauge galvanised steel conduit or trunking. Any conduit finishes where disturbed shall be re-coated with galvafruid or similar.

Trailing cables are to be suspended without the use of junction boxes. They shall be suspended from a cable hanger incorporating clamps that will secure the cable without damage or undue pressure on the conductors or insulation.

The cable anchorage shall be installed at the top and approximately halfway position of travel. Beyond the halfway point additional intermediate clamps are to be fitted every 3 metres which shall be carried from the shaft wall or guides. Clamps must be in accordance with the manufacturer instructions.

Each trailing cable shall contain a minimum of 20% spare ways, together with 2 twisted screened pairs.

Trailing cables will be terminated direct to the controller, at one end and either within the car station panel or in a junction box on the car top at the other.

Under no circumstances will junction boxes in alternative locations be permitted.

Flexible metallic conduit shall be used only as approved by the Engineer in cases where it is necessary to provide for adjustment or to reduce the transmission of noise and vibration. Flexible conduit length to be a maximum of 450 mm. Where such approval is given the conduit shall terminate in suitable couplings and shall positively grip the flexible conduit, and an additional earth continuity conductor shall be run outside the conduit between lengths.

The conduit shall be screwed between lengths and into all boxes and fittings and where bends or sets are required they shall be made from the conduit.

Hexagonal male brass bushes shall be used to terminate new conduit in boxes where an adequate screwed spout outlet is not provided.

An approved maker shall manufacture all cables and only one make of cable shall be used on the installation. All new cables shall be multi-strand and the minimum area of any one conductor shall not be less than 1mm sq (except travelling cables).

All wiring and travelling cables shall be 600/1000 grade having low smoke and fume insulation.

It must not be possible for any travelling cable to foul any fittings or equipment in the lift shaft and a suitable screen shall be fitted up to the halfway point in the shaft constructed from a non-combustible material. The cable screen must be of maximum width for the area of the shaft occupied by the cable and if of weld mesh, must be of continuous length, having a grid size no greater than 13mm. Any form of flexible screen must be fitted with an adjustable tensioning device capable of having adjustment of at least 100mm.

All cables and travelling cables shall be subjected at the maker's Works to the appropriate voltage tests, tests for thickness of insulation, insulation resistance, fire resistance and flexibility.

Screened ways are to be incorporated for intercom and car telephones terminated separately in the machine room and Lift car as approved by the Engineer.

The terminations to car lighting and fan supplies are to be shrouded and labelled.

All fixed items and components are to be fully earth bonded using 6mm insulated cable, the earthing to include such items as pit ladders, guards, lifting beams, &c.

The use of armoured cable is to be discussed and approved with the Engineer.

All trunking fittings shall be of a standard proprietary manufacture except where special fittings are necessary.

A cable strainer is to be provided in every 3 metre length of trunking.

ROPE TERMINATIONS

The rope terminations shall be:

- a) 4 Bulldog grips, thimbles and eyebolts, incorporating a lock nut and split pinned, or
- b) Metal rods with sockets for rope tucks, to be filled with white metal or epoxy resin. The clevis bolt to be secured by lock nuts and split pins, or
- c) Self-tightening wedge sockets with a minimum of 4 bulldog grips per rope.

Car and counterweight hitches shall be multi-point and the counterweight is to be fitted with spring tensioning depending upon rope configuration and layout.

Adjustment of the nuts on eyebolts will allow for raising the counterweight by 150mm relative to its suspension ropes.

Following completion of the installation and having given time for rope stretch, the Contractor shall return to site to shorten the ropes to maintain the necessary over travels. Any necessary overtime premium shall be included within the tender sum. (This shall also relate to governor and compensating ropes where fitted).

Wire lanyards are to be run through the car and counterweight terminations to prevent twisting. This is to be done as soon as the ropes have been fitted and properly tensioned.

Rope tails shall be between 150mm and 300mm long with the ends whipped and tied back.

CONTROL SYSTEM GENERAL REQUIREMENTS

Control Cabinet

A new control panel shall be fitted being of the steel enclosed cabinet type with louvered ventilation, internally and externally finished in powder coating or plastic skin plate. The identity of all the contactors, relays, solenoids, and other equipment in the controller shall be clearly indicated by means of permanent, heat resistant non-fade, plastic labels. Dymo or similar will not be acceptable. A key to abbreviations and symbols used will be affixed to the inside of the controller or controller door.

Access shall be from the front only unless complexity of equipment necessitates rear entry also. The doors shall be full height and width of the panel and shall be of double hinged mechanically latched type.

The enclosure shall provide protection to IP23 Standard.

All cable entry shall be from below.

The new controller must be designed and constructed to pass through the building without any alteration to the building fabric. Notwithstanding this requirement, the controller shall be of a suitable design to be comfortably accommodated within the motor room.

Two external lifting eyes are to be fitted to the top of the controller cabinet to allow lifting without distortion.

All resistors are to be mounted externally to the main control equipment in a housing mounted to suit the site conditions with suitable ventilation.

Doors shall not be of the lift-off type and shall be separately earthed.

A notice shall be permanently affixed to the controller door detailing the final torque settings entered on to the main drive inverter.

Where location dictates, control panel(s) shall be sound isolated.

Control Components

The system shall be microprocessor controlled.

The microprocessor section of the control panel shall be separately mounted, such that the inadvertent connections of high voltages or physical damage from falling objects are prevented.

All input/output lines must be capable of withstanding short circuits and the application of 500v for short duration i.e. megger tests, without permanent damage.

An electronic, non-resettable, permanently displayed digital trip counter shall be provided to record the number of journeys for the lift.

Each control panel is to be provided with a visual display showing the operating status of the Lift and incorporating LED indicators which show each of the following sequences:

- Power on
- Power to each processor board
- Lift in service
- Lift direction
- Calls registered for car and landing
- Door open/door close
- Safety edge operation
- Lift overload
- Lift on car preference
- Lift on door hold

The control cabinet shall be provided with an external changeover switch to convert from NORMAL to INSPECTION operation, together with UP and DOWN buttons, and an OVER-RIDE button.

When switched to INSPECTION all safety circuits will be in use. On operating the continual pressure OVER-RIDE button, the safety gear switch on the car, buffer switches, over travel limits, governor switch and governor tension weight switch will be over-ridden. This OVER-RIDE button is to assist in the release of the safety gear or to move the Lift from the overtravel limits.

This INSPECTION/NORMAL switch will NOT OVER-RIDE the mechanics control station or any other part of the safety circuit.

For each individual Lift a MAINTENANCE/NORMAL SERVICE switch is to be provided on the control panel which will prevent the Lift answering its landing calls.

A door isolation switch will be provided which will prevent operation of the car doors.

A key operated switch shall be provided to operate the overspeed governor (remote overspeed governor).

Where the Contractor's standard custom-built control system is proposed all items detailed in the specification are features and components that will be required as a minimum.

Where the preferred method for interrogating the lift control system when fault finding or altering the lift operating parameters is by the use of a portable or hand held device, then any such device shall be permanently located within the controller cabinet and shall become the employer's property. It shall be site specific and any unique identification number shall be recorded on the device.

Special cooling and/or filtration equipment is to be incorporated to reduce the spread of dust through the controller and to maintain satisfactory ambient temperatures and prevent local hot spots.

The following items are required:

- Phase failure/phase reversal protection
- Double journey timers
- Automatic homing [switched]
- Door nudging with audible signal
- All control equipment to be protected by miniature circuit breakers not fuses
- Door open/door close timers fully adjustable for dwell and operating speeds
- Anti-interference features for all car controls
- Earth terminals and full earth bonding
- Supplies to printed circuit boards shall be protected by miniature circuit breakers
- Microprocessor based car position reference system
- Thermal overloads for main motor protection or alternatively protection within the controller software
- Car and landing door lock short-circuit protection
- A device shall be fitted that determines the lift machine and machine room temperature. An over temperature will cause the lift to shut down at the next floor in a controlled manner.

Suitable outputs shall be provided to provide speech generation. The processor shall provide advanced signals to highlight such items as "Doors Closing" etc.

In the event of loss of tacho-generator feedback under normal conditions and on inspection control the Lift will immediately shut down and the brake will be applied. The Lift will no longer attempt to respond to calls until tacho-feedback has been reinstated.

The door open button within the lift car shall illuminate during the door closing cycle.

Equipment Reliability

The control circuit where fed from an alternating current source shall be greater than 100V and not greater than 240V.

On relay components the "VOLTAGE RELIABILITY" shall be at least 80%, i.e. the control circuits must operate at 25% below design voltage.

The "COMPONENT RELIABILITY" shall not be less than three million, i.e. the expected number of operations between two failures.

All timers shall be of solid state design.

All car and landing control indicators will illuminate until their call is answered by the lift.

The lift should not interfere with the reception of radio and television programmes or the supply of computer-related equipment. The lift equipment shall be fitted with the necessary interference suppression and filtration components during manufacture.

Car position reference systems shall be actuated by one of the following:

Shaft encoders
Transducers

Any other proposed system shall be with the approval of the engineer.

Car Preference

Car preference operation will be provided. With the key in the ON position the Lift will be removed from NORMAL operation and will respond only to car calls and will ignore all other automatic operations. The key will be captivated when in the "ON" position.

When under car preference the Lift will park with both car and landing doors open.

The Lift will respond to continuous pressure on the selected car floor push only and only the first call will be answered. For any subsequent call it will be necessary to press the car button to achieve further door closing.

Wiring Diagrams

Contract specific plastic encapsulated wiring diagrams are to be provided within the machine room in addition to those provide within the O & M Manuals.

FULLY COLLECTIVE CONTROL

Following registration of a landing call, the Lift will respond to that call only when it is travelling in the direction of the call.

It will store this call in memory if travelling in the opposite direction and answer it sequentially when travelling in the direction of the call.

If the Lift responds to a floor where both UP and DOWN calls are registered it will respond only to the call in the direction in which it is committed to travel.

If no car call is then placed and there are no further hall calls in that committed direction, the doors will re-open and its committed direction will reverse and it will respond to the other call.

Car calls will be answered sequentially as their destinations are reached irrespective of the order in which they were registered. As each car call is answered it will be cancelled.

Each controller is to incorporate automatic logging which will have an indicator display board to show a record of events covering the following Lift functions:

- Primary safety circuit failure
- Primary loop failure
- Car door switch fault
- Landing door lock fault
- Failure of doors to open
- Lift overloaded condition
- Landing and car calls cancelled
- Shutdown due to successive failed attempts to start
- Limited force door closing having been operated
- Memory failure
- Programme error
- Stuck landing/car call button
- Service to engineers visit
- Two spare signal/record facilities

HANDWINDING SYSTEM

An electronic hand winding system shall be provided which shall incorporate both audible and LED illumination. The equipment shall be wall-mounted adjacent to its corresponding hoisting machine and shall be easily viewed from the normal hand winding position.

A control switch mounted on the hand winding unit shall initiate the operation of the hand winding system. When switched "ON" and under hand winding operation, it will indicate both visually and audibly as the Lift becomes level with a landing floor level. The unit shall display the position of the lift car relative to the nearest landing.

Supply to the hand winding system shall be from an independent low-voltage source incorporating an emergency supply which automatically becomes available in the event of mains power failure.

Irrespective of the position of the mains supply switch, the operation of the switch on the hand winding buzzer system shall render all other controller components

inoperative and an illuminating indicator shall be sited adjacent to the hand winding switch to notify that the buzzer system is switched on.

MECHANICS CONTROL STATION

The car top control station panel shall be mounted vertically within 1000mm of the landing entrance and easily accessible from the landing. (In the through car condition it shall be accessible from the side with the majority of landing entrances)

The mechanics control station on the car top shall contain maintenance and testing switches, direction push buttons, a 13amp switch socket outlet with RCD protection, and a proprietary brand of 16 watt twin fluorescent bulkhead light fitting with polycarbonate or similar shatter resistant diffuser.

The light fitting shall also be provided with an emergency power source from an independent supply of 3 hours duration. This unit shall be sited on the car top.

It is permissible to feed the emergency car lighting from this source provided that a "3-hour" duration is maintained in each case.

All car top lighting and power points shall come from a common source but shall be individually fused.

All switches and push buttons shall be clearly marked with their functions.

Operation of these switches and push buttons shall be as follows:

Roof Light Switch

Control of Roof Light

Shaft Light Switch

In addition to the shaft lighting switch circuits specified for motor room and lift shaft, an intermediate switch shall be incorporated in the mechanics control faceplate, which will provide the shaft lighting system with a third point of operation.

Emergency Stop/Run Switch

The emergency stop switch shall be a push/pull type (push to stop pull to run). The button shall be at least 50mm in diameter and coloured red.

The stop button shall be proud of its shroud only in the "run" position.

The button shall show visual indication of both operational positions and incorporate the word STOP placed on or near it.

The button shall be positioned at the extreme top right position on the car top control panel.

Inspection/Normal Operation Switch

NORMAL - Normal operation

INSPECTION - Car and landing push buttons isolated: push buttons on mechanics control panel become operative, and the Inspection/Normal Operation switch becomes illuminated.

This words NORMAL and INSPECTION shall be marked on or near the switch.

The switch is to be protected against involuntary operation and a bi-stable design. The switch shall be shrouded.

The switch shall be positioned in the extreme top left on the car top control panel.

Door Control Switch

The words DOOR OPEN AND CLOSED placed on or near the switch and shall be positioned to the extreme bottom left on the car top control panel.

Up, Run and Down direction buttons

The up direction button, the run button and the down direction button shall be arranged centrally and vertically in line with the up direction button positioned at the top of the car top control panel.

These shall operate car in the UP or DOWN direction (only while the respective direction button and the intermediate run button are depressed). These shall operate under constant pressure.

Engineers Alarm Button

An enshrouded continuously illuminated alarm push in yellow and engraved **alarm** over a red back ground and located below the stop button.

A mechanically operated UP inspection limit is to be incorporated in the control circuit so that when the INSPECTION switch is in the INSPECTION position and the UP button is depressed, the car shall stop at the top of the lift shaft low enough to ensure that a 2 metre tall person standing on the top of the car shall be in no danger of coming into accidental contact with any overhead equipment or structure. Immediately after the UP test limit has been set and checked for final position the limit supporting arm, in addition to the conventional clip fixings, is to be twice pinned through the guide flange. In addition, a notice is to be fitted with the wording **WARNING - DO NOT MOVE UP INSPECTION SAFETY LIMIT**.

All controls shall be fully shrouded and sensibly positioned, accessible and no further than 1 metre from the entrance.

PROTECTIVE SCREENS & GUARDS

1. All rotating equipment and extended rope traverses shall be guarded.
2. Equipment guards shall comprise a profiled rod frame with 10 swg welded mesh infill. Mesh shall be a maximum of 20mm grid.
3. The fixings for the guards are to be easily removable.
4. All fixings shall be of a standard size and require the use of a specific tool for releasing. The tool shall be provided and kept mounted on the machine room tool board.
5. Framed hinged access flaps shall be provided, sensibly sited for ease of inspection and maintenance.

6. Steel rope hole reducers shall be floor fixed and incorporate a 50mm raised collar and felt restrictor providing a safe minimum running clearance.
7. Motor and generator commutators shall be guarded; the guards to comprise a rod frame and 12mm mesh with the design being specific for each application.
8. The flanges of beams and other hazards with less than 2.1 metres clear height shall be clad in 25mm thick Neoprene padding having BLACK and YELLOW warning stripes.
9. Where light fittings are suspended giving less than 2.1 metres clearance they shall be provided with a wire mesh guard.
10. Access hatch covers in the lift motor room are to be faced in aluminium chequer plate, which has an embossed non-slip surface. All edges of the plate covering are to be ground to an angle finish to prevent tripping hazard. Suitable recessed handholds shall be provided.
11. Where the access hatch is located in the floor of the motor room it shall incorporate a safety handrail which engages with the flap or flaps of the hatch. The engaging bar will mechanically latch the flaps in the vertical position.
12. All unguarded upper machine room levels shall be fitted with removable tubular steel safety handrails. The tubing shall be completely demountable with a minimum 50mm cross section. In addition to upright supports at each end, intermediate supports shall be located at a maximum of 1 metre pitch. A horizontal mid-rail shall also be provided which shall be a minimum of 25mm cross section.
13. All holes and apertures in the lift shaft, machine or pump room or top wheelhouse shall be properly filled or screened.
14. A permanently fixed flat step steel access ladder and handrail is to be fitted between differing machine room levels.
15. Rope hitch plates where exposed in working areas shall be covered in removable steel sheet guards. These guards shall be secured with wing-nuts.
16. Steel fascias of a minimum 16 swg shall be provided the full width of the header. Bracing and stiffening is to be provided to prevent distortion. The header is to extend from sill level to the header of the floor below.
17. At the lowest terminal floor a ramped steel fascia will extend to 750mm. At the upper terminal floor a similar ramped section will be affixed to the header.
18. A ramped toe-guard shall be fitted to the underside of the car of sheet steel construction. It shall extend 50mm beyond each side of the clear opening and be ramped and braced back to the underside of the car. The toe-guard shall be 16 swg steel sheet minimum and extend 750mm below the car sill. Countersunk screw fixings shall be used at 150mm centres.

19. All ledges over 150mm shall be ramped in 16 swg steel sheet to an angle of 70° with the design of ramp to suit the particular application.
20. Voids in the lift shaft shall be guarded with mesh suitably braced screens which shall comprise 38mm RSA frames with 16 swg mesh infill. Mesh shall be a maximum of 50mm grid of 10 gauge galvanised weld mesh.
21. Shaft division screens shall be framed in a minimum of 38mm RSA with a 50mm grid of 10 gauge galvanised welded mesh suitably braced.
22. The counterweight screen is to be framed in 25mm RSA with 25mm weld mesh infill. Where clearance does not permit the use of an angle frame, either a flat bar or rod frame is permissible. The counterweight guard shall completely enclose the buffer area from a point 75mm below the fully buffered position to a height of 2.5 metres from this point.
23. Where trailing cables may come into contact with the lift shaft walls or shaft equipment, a flex screen shall be fitted. The screen shall be in the form of a cable tray approximately 300mm wide fixed from the halfway point downwards. Additionally, tensioned vertical air cord or vertical conduit may be used secured between bracket fixings.
24. A permanently fixed pit access ladder shall be fitted. It shall comprise flat steel steps and a separate grab rail and shall be easily accessible from the lowest terminal landing.
25. Where a deep pit condition exists, steel chequer plate decking shall be fitted to provide an adequate working platform and to act as staging for the lower pit level.
26. A 1 metre high barrier rail shall be fitted to the rear and sides of the car roof, where clearance permits. The handrail shall not run within 70mm of the perimeter of the Lift car. The rail shall be of 35mm square section and shall not bridge the car isolation. In addition, a 100mm kicking board shall be provided to the car top, which shall be painted in black and yellow diagonal stripes.

MACHINE ROOM LESS LIFTS. (M.R.L)

This type of Lifts is not approved for use in University of Southampton properties without the specific written approval of the engineer.

In addition to the aforementioned requirements the following specification for machine-room-less lifts shall be provided. Generic lift equipment from the approved components must be used.

Guides

Guides shall be positioned in a conventional layout with one guide each side of the lift car and separate counterweight guides. All guide fixings shall be independent of each other. Substantial Tee section guide rails shall be provided to the car and counterweight, The minimum guide blade thickness shall be 16mm on the car and 9mm on the counterweight.

Type of roping

The roping layout for the lift shall be 2:1 under slung.

Drive Unit.

The drive unit shall be a gearless unit. The drive unit shall either be mounted within the lift shaft pit or headroom area.

Controller

The controller shall be as detailed within the aforementioned specification. It shall be capable of being positioned anywhere within 10 metres of the bottom floor.

The controllers shall be positioned within a suitably sized secure room where the equipment can be worked on safely. There shall be at least 1 metre x 1 metre of free working space in front of the controller.

Lift electrical services and the lift mains supply shall be provided in the controller room.

A 200mm square straight duct shall be provided from the controller room to the lift well. A draw wire shall be left in the duct if it is over 1 metre long.

Counterweight Frame

A conventional counterweight frame must be employed on the lift. The counterweight shall weigh a value equal to the lift car weight + 50% of the contract load.

HYDRAULIC LIFTS

In addition to the aforementioned requirements the following specification for hydraulic lifts shall be provided.

Guides

Guides shall be positioned in a cantilevered arrangement up to a Lift Contract Load of 8 Persons 630 Kg. Above this contract load the car guide rails shall be positioned each side of the Lift Car. Substantial Tee section guide rails shall be provided to the car and counterweight, The minimum guide blade thickness shall be 16mm on the car.

Ram/Cylinder

Up to a Lift Contract Load of 8 persons 630 Kg a single ram may be employed. Above this contract load at least two rams shall be employed.

Type of roping or chain layout.

The roping/chain layout for the lift shall be 2:1 rope suspended.

Drive Unit.

The drive unit shall consist of a steel fabricated tank with rubber isolation between its feet and the floor. The unit shall incorporate a submerged motor and screw pump. The control valve shall be mounted to the top of the tank and shall incorporate closed loop feed back technology.

The drive unit shall incorporate as a minimum a hand pump, a pressure gauge, a manual lowering facility and high and low pressure switches. A low-pressure protection facility will prevent the lift being manually lowered if the working pressure to the ram is reduced to below the minimum allowable working pressure.

It shall be designed as a minimum to be able to cope with 60 motor starts per hour.

Machine Room

A machine room shall be provided. It shall incorporate the drive unit, controller, and Lift Electrical services. The machine room shall be suitably heated and ventilated to dissipate the heat generated by the lift equipment.

Lift Speed.

Hydraulic lifts shall not exceed a contract speed of 0.6 m/s due to potential heat build-up. Higher speeds may be acceptable but must be agreed by the engineer.

EVACUATION LIFTS.

Where evacuation lifts are installed the following is required as a minimum.

Controller.

The controller shall comply fully with the requirements to function as an “Evacuation Lift” and as detailed within BSEN81-72.

In the event of power failure the control system shall “remember” what floor the lift is on.

Communication.

A communication system shall be installed between the machine room, the lift car and each landing. The master communication panel shall be installed at the main fire access level and it shall be possible from this floor to contact and speak to any other communication panel.

All other communication panels shall be able to contact and speak to the master panel.

The communication panel shall incorporate a “euro” type key switch, which when activated will instate the communication system and switch on the evacuation control mode of the lift.

Secondary Back Up Power Supply.

A secondary back up power supply for the lift in accordance with BSEN81-72 shall be provided.

WHEN INSTALLING AN EVACUATION LIFT THE LIFT SHALL BE TRACTION DRIVEN.

FIRE FIGHTING LIFTS

Fire fighting Lifts shall be designed in accordance with current standards and Regulations.

All the requirements covered within this design brief shall be met apart from the following differences:

- When installing Machine Room Less Lifts, the drive unit shall be positioned at the top of the lift shaft and the roping arrangement can be 1:1 if required.
- Position Indicators shall be of UK third party supply suitable for the temperature range needed to comply with this standard.

GENERAL

During planning of the lift facility for a building as traffic analysis shall be carried to establish the number of lifts required together with the performance requirements of the lift. This will establish the lift speed and size and duty requirements.

PLATFORM LIFTS.

Platform lifts shall comply with BS 6440.

The maximum vertical travel shall be 4 metres.

The minimum size of the platform shall be 1100mm wide x 1400mm deep for vertical platform lifts and 900mm x 1200mm for stair platform lifts.

The platform must be directly driven through a mains supply and must not rely on batteries that are charged when the platform is not in use.

Platform Lifts shall only be installed where it is not practical to install a conventional passenger lift.

STAIR LIFTS

Stair lifts shall comply with BSEN81-40: 2008.

The Stair Lift must be directly driven through a mains supply and must not rely on batteries that are charged when the platform is not in use.

A stair lift must only be installed as a last resort.

SCHEDULE N°1: GENERAL REQUIREMENTS

Minimum Requirements	Passenger Lift
Type of Lift	Passenger Lift
Carrying Capacity	8 Person 630 Kg
Operating Speed *	
Motor Drive System	Variable Frequency
Control System	Fully Collective
Floors Served *	
Floor Designation *	
Machine Room Location *	
Car Entrance Type	Two Panel Centre Parting
Landing Entrance Type	Two Panel Centre Parting
DIMENSIONS	
Lift Car (minimum size)	Width 1100mm Depth 1400mm Height 2200mm
Entrance	Width 900 mm Height 2000 mm
Total Travel *	
Pit Depth *	
Headroom *	
SPECIAL REQUIREMENTS	
Fire Fighting Lift to BS5588 *	
Fire Fighting Control Only *	
Evacuation Control to BS5588 Pt 8*	
Standby Generator Interface *	
BMS Interface *	
Fire Alarm Recall *	
Isolation of floor by key switch within car *	

- = To Be Completed by the lift contractor at tender stage.

During planning of the lift facility for a building as traffic analysis and disabled access assessment shall be carried to establish the number of lifts required together with the performance requirements of the lift. This will establish the lift speed and size and duty requirements.

SCHEDULE N°2: LANDING FIXTURES AND FINISHES

Detail	Passenger Lift
Landing Door Finish All Floors	Pattern Stainless Steel 304 Grade BA
Architrave Finish All Floors	Pattern Stainless Steel 304 Grade BA
Sill Type	Extruded Aluminium
Push plate Finish All Floors	Satin Stainless Steel 304 Grade 240 Grit
Pushbutton Type	Lift Store US91 EN L.E.D. Illuminated Tactile
Number of Risers	One
Landing Indicators All Floors	Incorporated in landing push station, digital with separate direction of travel arrows and arrival chimes

SCHEDULE N°3: LIFT CAR FIXTURES AND FINISHES

Details	Passenger Lift
Car Door Finish	Pattern Stainless Steel 304 Grade BA
Car Sill Finish	Extruded Aluminium
Front Return and Overgate Panel Finish	Pattern Stainless Steel 304 Grade BA
Position Indicator Type	Digital with Separate Direction of Travel Arrows
Separate Faceplate	Not required
Pushbutton Type	Lift Store US91 EN L.E.D. Illuminated. To incorporate audible signal for call acceptance.
Number of Car Stations	One
Faceplate Finish	Satin Stainless Steel 304 Grade 240 Grit
Side Wall Finish	Pattern Stainless Steel 304 Grade BA Car Panel Joints to incorporate a Darvic Strip
Rear Wall Finish	Pattern Stainless Steel 304 Grade BA Car Panel Joints to incorporate a Darvic Strip

Details		Passenger Lift
Skirting		Satin Stainless Steel 304 Grade 240 Grit
Ventilation		At High and Low Level
Flooring		Altro Designer 25
Ceiling		Sprayed Eggshell White Cellulosed to BS 4800
Lighting		Two Recessed Light Fittings with Emergency Light Converter
Handrail	Type	45mm Dia Tubular
	Finish	Satin Stainless Steel
	Walls	One Side and One Rear
Drapes and Studs		Required
Telephone Unit-Emergency Communication System		Windcrest AD1000-EN28
Fan Unit		Required