



Consortiwm Awdurdodau Lleol Cymru
Consortium Local Authorities Wales

Lift Services Specification

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the Engineering Project Group
in association with
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LS.01.0 LIFT SERVICES GENERAL

LS.01.01 The workmanship, installation and testing of the lift installation shall in all respects conform to the following:

1. BS 2655-1:1970, BS 5655-all current parts, BS 8300:2001, BS EN 12385-1:2002, BS.EN 81-1:1998, BS.EN 81-2:1998, BS.EN 81-3:2001, BS EN 12016 1998
2. Building Regulations.
3. Management of Health and Safety at Work Regulations 1999 (3242).
4. Construction (Health, Safety and Welfare) Regulations 1996 (1592)
5. Provision and Use of Work Equipment Regulations 1998 (PUWER)
6. BS 7671: 2001, Requirements for Electrical Installations Wiring Regulations Sixteenth Edition
7. The Electricity Supply Regulations 1988
8. The Construction (Design and Management) Regulations 1994 (3140)
9. The local Fire Authorities requirements.
10. The requirements of the Authorities insurers.
11. Local Authority Byelaws, Regulations and Notices.
12. Electrical Equipment (Safety) Regulations 1994 (3260).
13. Work Equipment Regulations 1998 (2306)
14. Manual Handling Operations Regulations 1992 (2793)
15. Workplace (Health Safety and Welfare) Regulations 1992 (3004)
16. Personal Protective Equipment at Work Regulations 1992 (2966)
17. Construction (Head protection) Regulations 1989 (2209)
18. The Disabled Discrimination Act 1995 (1999)

LS.02.0 DESIGN

LS.02.01 The whole of the installation shall be so designed and installed to ensure that maintenance works are reduced to a minimum and can be easily carried out. Individual lift details shall be as detailed the Appendices to this Specification Document

LS.03.0 BUILDERS WORK AND DRAWINGS

LS.03.01 The builders work associated with the lift installation will be carried out by the Main Contractor.

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LS.03.0 BUILDERS WORK AND DRAWINGS (Cont'd)

- LS.03.02 The Lift Contractor shall provide detailed drawings, showing apertures, holes, chases, trenches, ducts and plinths as required for the installation and shall be responsible for the accuracy thereof.
- LS.03.03 The drawings shall be submitted to the Main Contractor for transmission to the Contract Administrator for approval within 21 days of the receipt of an order or letter of intent.
- LS.03.04 On approval of the drawings 5 copies shall be provided to the Main Contractor for distribution.

LS.04.0 MATERIALS AND WORKMANSHIP

- LS.04.01 All articles, materials, machinery and equipment used and workmanship employed in connection with the contract shall be of the highest quality.
- LS.04.02 All goods included in the works shall be new and comply with the current British Standards, be as far as practical of British or E.E.C. Manufacture.
- LS.04.03 The Lift Contractor must place an order for all materials required for the contract at such time to ensure delivery to site before such items are actually required to avoid any delay in the progress of the work.
- LS.04.04 No substitution of materials etc, specified will be permitted except by written consent of the Contract Administrator.

LS.05.0 SUPERVISION OF WORKS

- LS.05.01 The Lift Contractor shall employ a competent representative or 'Foreman-in-Charge' to supervise and control the works on site with authority to discuss modification to the works as may be required from time to time, and on receipt of properly authorised site instructions, accept and execute such instruction on behalf of the Lift Contractor.
- LS.05.02 This representative and such additional site staff, as the Contract Administrator may deem necessary, shall be available on site during all working hours, unless previously agreed otherwise by the Contract Administrator.

LS.06.0 ELECTRICAL INSTALLATION

- LS.06.01 The electrical installation works to be carried out by the Lift Contractor shall commence at the TPN isolator, switched connection units for the car, and shaft lighting and pit socket.
- LS.06.02 The Lift Contractor shall be responsible for the provision of the lighting to the lift shaft and the socket outlet located in the pit.
- LS.06.03 The electrical installation work shall conform in all respects with all relevant parts of BS7671 and the current C.L.A.W. Electrical Specification.

LS.07.0 EMERGENCY ALARM

- LS.07.01 A two way means of communication is a requirement of BS EN 81: 1998 the Lift Contractor shall provide a remote elevator monitoring system. To facilitate this feature a telephone line connection (terminating in RJ11 outlet) will be made available to a determined position as agreed between the Lift Contractor and the Contract Administrator.

LS.08.0 WINDING GEAR

- LS.08.01 The machine to be of the worm geared, traction type with motor, brake, gear box and pedestal unit mounted on a continuous bed plate of cast iron or steel construction to form a completely self contained unit.
- LS.08.02 The worm shall be of forged steel integral with the worm shaft and provided with thrust bearings designed to take the end thrust of the worm in both directions.
- LS.08.03 The driving sheave and crown wheel shall be securely keyed to a steel shaft rotating in a sleeve or ball or roller bearings and all are to be fitted with automatic lubrication and means are to be provided for adjustment of the worm shaft in relation to the crown wheel so as to ensure accurate engagement and alignment.
- LS.08.04 The worm wheel shall be centrifugally cast phosphor bronze rim accurately hobbled after fitting to the spider or wheel.
- LS.08.05 The worm shall be ground to accurate profile after machining.

Cont'd

LS.08.0 WINDING GEAR (Cont'd)

- LS.08.06 The ratio of sheave diameter to crown wheel diameter shall not exceed 1.75:1.
- LS.08.07 Directly coupled to the wormshaft and rotating at the same speed shall be a unit to relay to the control system both the speed and the position of the lift in the shaft.
- LS.08.08 The brake shall be spring actuated, electrically released and of adequate proportions for the duty involved. It shall operate on a brake drum keyed to the worm shaft and shall be fitted with two self aligning shoes actuated by compression springs. The brake shall be instantly and automatically applied in the event of interruption of the power supply.
- LS.08.09 The requisite number of grooves of preformed profile shall be accurately machined in the rim of the sheave which shall contain sufficient metal to allow for re-grooving if necessary.
- LS.08.10 Means shall be provided to enable the machine to be hand wound in an emergency.
- LS.08.11 The brake release lever shall be devised so that it cannot be inadvertently left in position.

LS.09.0 PULLEYS

- LS.09.01 The Lift Contractor shall provide all deflector pulleys necessary to obtain the correct lead of the lift ropes to car and counterweight.
- LS.09.02 Pulleys shall be in cast iron, accurately machined and grooved for the diameter of ropes used.

LS.10.0 MOTORS

- LS.10.01 The type of motor to be provided for the lift will be given in the Appendices to this Specification Document but should be one of the two types indicated below.
- LS.10.02 Motors, in all cases, shall be specially designed for lift duty, shall run at all loads without appreciable noise or hum, and bear the manufacturers name plate and details.

LS.11.0 POLE CHANGE MOTORS

- LS.11.01 The Pole Changer machine is to incorporate a foot mounted pole changer driving motor permanently coupled to the gear by a multi-vee rope drive.
- LS.11.02 The duty rating of the motor which is to have a 4:1 speed range is 150 starts per hour which is to be achieved without forced ventilation.
- LS.11.03 Levelling accuracy shall have a maximum tolerance of +/- 12.0mm.

LS.12.0 AC. VARIABLE VOLTAGE MOTORS

- LS.12.01 The motor shall provide a smooth fast run and the acceleration rate shall be no greater than 1.3 metres/second with a jerk rate not in excess of 2.7 metres per second.
- LS.12.02 Acceleration and deceleration shall incorporate solid state equipment controlling thyristors which shall control the torque developed by the motor to enable it to perform in accordance with an ideal velocity profile.
- LS.12.03 The motor is to be separately excited reversible and capable of stable operation at all speeds up to the stated maximum.
- LS.12.04 The commutator and brush gear are to be designed to give sparkless commutation under all conditions of load and speed.
- LS.12.05 The frame is to be of the open ventilation type giving easy access to the commutator for maintenance purposes and fitted with ring lubricated journal bearing or ball bearings provided with grease nipples.
- LS.12.06 The motor shall have a speed not exceeding 1500 r.p.m. and have a duty rating of not less than 240 starts per hour to be achieved without forced ventilation.
- LS.12.07 The levelling accuracy shall have a maximum tolerance of +/- 5mm.

LS.13.0 HYDRAULIC POWER UNITS

- LS.13.01 The driving system shall comprise a power unit complete with motor, fully immersed pump, storage tank, oil/hydraulic controller incorporating control and relief valves mounted as one assembly on a continuous bedplate of fabricated steel.

Cont'd

LS.13.0 HYDRAULIC POWER UNITS (Cont'd)

- LS.13.02 All ancillary equipment, accessories and hydraulic fluid shall be provided by the Lift Contractor.
- LS.13.03 The Lift Contractor shall supply and install beneath the power unit a catchpit tray of heavy duty metal, capable of retaining all the hydraulic fluid in the event of a leakage.

LS14.0 SUSPENSION ROPES, FIXINGS AND APERTURES

- LS.14.01 Suspension ropes of high grade steel specially designed for lift duty shall be supplied and fitted in conformity with the requirements of BS EN 12385-1:2002
- LS.14.02 Each rope shall be provided with means of independent adjustment.
- LS.14.03 Not less than four ropes independent of one another shall be used for the car.
- LS.14.04 Approved arrangements are to be made at anchorage points on the car and the counterweight to ensure that sufficient adjustment is available for each rope to compensate for rope stretch during the service of the lift without the necessity of remaking the suspension rope ends.
- LS.14.05 An automatic device shall be provided for equalising the tensions of suspension ropes at least at one of their ends.
- LS.14.06 Governor ropes, not less than 8mm diameter and specially designed for their duty, shall pass over the governor and under a weighted pulley in the pit with their ends correctly secured to the safety gear mechanism on the car.
- LS.14.07 After the suspension ropes have been fitted, the holes in the motor room floor shall be reduced to the minimum amount of opening required for the free passage of the ropes etc, and shall be achieved by means of metal plates, with felt inserts of approved design, positively secured in position, but easily removable for the renewal of suspension ropes etc, and maintenance.

LS.15.0 GUARDING

- LS.15.01 All dangerous parts of lift motor room machinery must be effectively guarded unless they are so placed and constructed as to be safe as they would be if guarded.

Cont'd

LS.15.0 GUARDING (Cont'd)

- LS.15.02 Those parts which should be guarded if not safe by position or construction are rotating shafts, couplings etc.
- LS.15.03 Details of other parts which should be guarded are given in BS.EN 81-1:1998
- LS.15.04 Remote fencing does not afford protective guarding for dangerous parts of machinery and therefore close fitting guards should always be provided.

LS.16.0 SAFETY LADDERS

- LS.16.01 Where the lift machinery is mounted at a higher level than the machine room floor, the Lift Contractor shall provide and install, at an approved position, a substantial mild steel ladder, complete with handrail, which shall be firmly fixed.

LS.17.0 LIFTWELL STEEL WORK

- LS.17.01 The Lift Contractor is to provide and install all necessary steelwork associated with the lift installation including counterweight and intershaft close mesh screens, handrails etc.
- LS.17.02 Where two or more lifts are installed in a common shaft, a rigid screen shall be fixed between the two lifts. It shall be constructed from heavy gauge mesh, galvanised and suitably supported in a steel framework.

LS.18.0 LIFTWELL GUIDES AND FIXINGS

- LS.18.01 All guides and fixings shall conform to BS.5655 Part 9:1985, AMD 5186:1986, AMD 5786:1988
- LS.18.02 The guides shall be machined tee section steel, the joints being spigotted and fish-plated with machined surfaces on both rails and fish-plates.
- LS.18.03 The guides shall be straightened before machining and finished to guaranteed limits of 0.05mm.

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LS.18.0 LIFTWELL GUIDES AND FIXINGS (Cont'd)

- LS.18.04 Steel brackets and fixings bolts shall be included for all guides for reinforced concrete walls, steel inserts may be installed to the wall shuttering or brickwork subject to the Contract Administrators approval.
- LS.18.05 It shall be noted that fixings by ragbolt are not acceptable.
- LS.18.06 Means shall be provided to maintain the car guide shoes in correct alignment with the guides.

LS.19.0 LIFTWELL BUFFERS

- LS.19.01 Buffers shall in all respects conform to BS EN 81-1:1998.
- LS.19.02 Buffers shall be appropriate to the load and speed of the car and they shall be complete with any steel stools, stands, supports etc necessary to attain the correct height above the floor of the pit.
- LS.19.03 Where spring type buffers are offered they shall be helical coil type with a constant spring rate.

LS.20.0 LIFTWELL COUNTERWEIGHT

- LS.20.01 The counterweight shall comprise of cast iron fillers securely housed in a rigid, fabricated steel frame and shall be equal in aggregate to half the contract load plus the total weight of the car when the car is located at midway level.
- LS.20.02 The filler weights are to be shaped and satisfactorily secured against any appreciable movement during travel by means of two steel tie rods passing through each filler station. The tie rod ends shall be provided with locknuts or split pins or other approved means to prevent the nuts working loose.
- LS.20.03 The counter weight guide shoes shall be provided with automatic lubricators.

LS.21.0 LIFT PIT LADDERS

- LS.21.01 Where the depth of the lift pit dictates, the Lift Contractor shall provide, install and securely fix an appropriate ladder to enable easy access to be obtained to the lift pit.

LS.22.0 LIFT PIT MAINTENANCE SWITCH

LS.22.01 A lift pit maintenance switch shall be provided and installed in the lift pit.

LS.22.02 This switch shall be a double pole type located in a safe and accessible position.

LS.22.03 The purpose of this switch is to render the lift inoperative so that inspection and maintenance work can be carried out safely and shall override all other controls.

LS.22.04 The switch shall provide the following features and its function marked with ivory labels:-

"NORMAL": with the switch in this position the lift should operate normally from the car or landing.

"STOP": with the switch in this position, the lift shall stop and remain in that location until the switch is returned to normal. When this switch is in the stop position it shall not be possible to operate the lift from any other controls.

LS.23.0 LIFT SHAFT LIGHTING

LS.23.01 The Lift Contractor shall provide and install luminaires in the lift shaft together with the associated wiring.

LS.23.02 The Supply to the luminaires shall emanate from the connection unit located in the machine room which will be provided by others.

LS.23.03 The lighting shall comprise of bulkhead type luminaires with clear diffusers mounted 500mm from the top of the lift shaft, 500mm from bottom of lift shaft and intermediate luminaires mounted between these at a maximum of 7000mm spacing.

LS.23.04 This lighting shall have two way switch control accessible from the lower terminal floor entrance and the top terminal floor entrance.

LS.24.0 LIFT WELL POWER

LS.24.01 The Lift Contractor shall provide and install a suitable socket outlet in the lift pit which shall be supplied from a connection unit in the machine room provided by others.

LS.25.0 LIFT PIT PROPS

- LS.25.01 On all lifts a device shall be provided to create a space below the lift car and the bottom of the lift well to equal that specified in BS EN 81-1:1998.
- LS.25.02 The device shall be a prop, scotch, or guide clamps and shall be capable of supporting the lift car and its rated load.

LS.26.0 LIFTING BEAM

- LS.26.01 The Lift Contractor shall provide and install a lifting beam of adequate size and location, complying with the requirements of BS5655 Part 1 and Part 5.
- LS.26.01 The Lift Contractor shall 'proof test' the beam and mark the safe working load in a prominent position.
- LS.26.03 All test certificates shall be handed to the Contract Administrator on completion.

LS.27.0 FLOOR LANDING ARCHITRAVES

- LS.27.01 Architraves at each landing entrance shall be provided and fixed by the Lift Contractor.
- LS.27.02 Details of the required finishes and type of architrave will be given in the Appendices to this Specification Document.
- LS.27.03 Where plain or rigidised stainless steel architraves are specified they shall be manufactured from suitably reinforced 16 s.w.g. stainless steel panels with all right angles provided with a slight radius.
- LS.27.04 All architraves shall be suitable for the particular wall thickness.
- LS.27.05 The Lift Contractor shall be totally responsible for ensuring that all architraves are correctly positioned and true and that the Main Contractor completely fills in behind the architraves with fine mortar.
- LS.27.06 Sill and door track assemblies shall be integral with the landing architraves.
- LS.27.07 The maximum clearance between the doors and architrave shall be 6mm, and the Lift Contractor shall ensure that the architrave structure meets the fire resisting requirements.

LS.28.0 FLOOR LANDING ENTRANCE STEELWORK

- LS.28.01 The Lift Contractor shall provide and install all the landing entrance steelwork, top and bottom track, sills and panelling to mask the top track.
- LS.28.02 The whole unit shall be self supporting and arranged so that it can be built up as a unit on site if necessary.
- LS.28.03 Provisions shall be made for fixing the landing entrance angle steelwork to the front or side walls and floor slabs.
- LS.28.04 Door tracks shall be constructed of solid 'D' section.
- LS.28.05 Sills shall be grooved non-slip type with a plastic or bitumen filler placed beneath the sills to prevent corrosion.

LS.29.0 FLOOR LANDING FIREMAN'S CONTROL

- LS.29.01 If a fireman's control is required it will be detailed the Appendices to this Specification Document

LS.30.0 FLOOR CAR POSITION LANDING INDICATOR

- LS.30.01 Only when more than two floors are served will a car position landing indicator be required, and shall be detailed the Appendices to this Specification Document

LS31.0 FLOOR LANDING DIRECTIONAL ARROWS

- LS.31.01 Only when more than two floors are served will directional arrows and shall be detailed the Appendices to this Specification Document

LS.32.0 FLOOR LANDING PUSHES

- LS.32.01 Landing stations are to be provided at each floor common to all lifts at 1000mm above finished floor level. All landing control pushes shall be of a combined tactile indicator/Braille type with each push having a minimum size of 50mm.

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LS.32.0 FLOOR LANDING PUSHES (Cont'd)

- LS.32.02 At terminal floors only one push 'UP' or 'DOWN' as appropriate will be fitted.
- LS.32.03 At intermediate floors, both 'UP' and 'DOWN' call pushes will be installed together with a 'lift coming' or 'call accepted' indication to enable passengers to register the direction in which they wish to travel.

LS.33.0 CAR AND LANDING DOORS

- LS.33.01 The car and landing doors shall be automatic power operated, flush, sliding type.
- LS.33.02 The car and landing doors shall be satin stainless steel finish or as indicated in the Appendices to this Specification Document.
- LS.33.03 Unless specified in the Appendices to this Specification Document., car doors will be front opening, with a closing speed not faster than 500mm per second, and timed to stay open for at least 6 seconds to allow for wheelchair entry.
- LS.33.04 Safety edges shall be fitted to car and landing doors so arranged that during normal operation the door will stop and reverse to the fully open position before they meet an obstruction

LS.34.0 LIFT CAR FRAME AND PLATFORMS

- LS.34.01 The car frame shall be made of structural steel members with a factor of safety indicated in the latest edition of BS EN 81-1:1998.
- LS.34.02 The platform shall consist of a steel frame and bearers supporting a substantial wood floor with the provision for covering as specified in the Appendices to this Specification Document.
- LS.34.03 The car frame shall carry rubber pads on which the car platform shall rest thus isolating the car from the frame.

LS.35.0 LIFT CAR GUIDE SHOES

- LS.35.01 Car guides shoes shall be fitted with automatic oil lubricators of approved design.

LS.36.0 LIFT CAR FINISHES

- LS.36.01 The car shall be lined with appropriate material, and the interior shall be fitted with a plastic laminate of approved colour as specified in the Appendices to this Specification Document.
- LS.36.02 A 100mm stainless steel skirting is to be installed.
- LS.36.03 A stainless steel hand rail is to be provided on the side and rear walls, rectangular in cross section 75mm LS 100mm set out a maximum of 40mm from the walls 1000mm above floor level.
- LS.36.04 The ceiling is to be overall illuminated opal perspex panel with fluorescent lights and a three hour duration emergency light to give illumination levels of 150 lux and 8 lux respectively at floor level.
- LS.36.05 In lifts serving more than two floors a car position indicator shall be fitted.
- LS.36.06 This indicator shall take the form of a satin finish flush mounted stainless steel panel located above the doors.

LS.37.0 LIFT CAR AUDIBLE SIGNALS

- LS.37.01 In lifts serving more than two floors an audible announcement of lift arrival and direction of travel shall be included.

LS.38.0 LIFT CAR CONTROL PANEL

- LS.38.01 Touch light controls are to be installed set horizontally at a minimum of 300mm centres and at a maximum height of 1300mm above floor level on the car side wall.
- LS.38.02 A key operated service control shall be provided to give car preference. Operation of this switch shall remove the car from the system and cancel any existing car call.

LS.39.0 CAR TOP CONTROL

- LS.39.01 These shall be in accordance with BS.5655-7:1983, AMD 4912:1985.
- LS.39.02 All control switches and push buttons on the car top control station shall be legibly marked with their functions and operational aspects by means of engraved ivorine labels.

LS.40.0 LIFT CONTROL PANEL

LS.40.01 The lift control panel shall comply with the requirements of BS7671 and the Electricity at Work Regulations. The main switch for the lift control panel shall be interlocked such that the electrical supply to all control items within the panel are fully disabled when the door of the panel is open. The panel shall be designed to allow for safe access and maintenance in accordance with the recommendations of HS (G) 13 – Electrical Testing.

LS.40.02 The control system for the lift shall be either:

- (i) traditional relay contact control system or
- (ii) electronic/microprocessor based control system

LS.40.03 If the control system for the lift is an electronically or microprocessor based control system, then the system architecture shall not be of a dedicated type restricted to a single supplier or installer. Any software, firmware, maintenance equipment, fault finding equipment or reset modules shall be available to any company who may be required to undertake future maintenance works.

LS.41.0 LABELS AND CIRCUIT LISTS

LS.41.01 The Lift Contractor shall allow for the supply and fixing of white ivory or traffolyte labels to all switchgear, and control panels supplied and installed by him.

LS.41.02 These labels shall be engraved in 5mm block letters, filled black, and shall be fixed to cover plates etc by sheradized self tapping screws.

LS.42.0 SAFETY SIGNS AND WARNING NOTICES

LS.42.01 All signs and notices shall comply in all respects to BS EN 81-1:1998.

LS.42.02 The Lift Contractor shall provide and install adjacent to the control panel a "Treatment for Shock" notice as supplied by Electrical Times.

LS.42.03 The Lift Contractor shall provide and install notices as follows in the machine room in ivory, traffolyte or metal with black lettering on a white background,

ELECTRIC LIFT

Cont'd

LS.42.0 SAFETY SIGNS AND WARNING NOTICES (Cont'd)

LS.42.03 (Cont'd)

HANDWINDING SHALL ONLY BE UNDERTAKEN BY AUTHORISED PERSONS

HYDRAULIC LIFT

HANDLOWERING SHALL BE UNDERTAKEN BY AUTHORISED PERSONS AND AFTER THE DRIVING MOTOR HAS BEEN ISOLATED FROM THE MAIN ELECTRICAL SUPPLY.

A detailed step by step procedure to move the lift in the case of an emergency shall also be provided.

LS.42.04 The Lift Contractor shall supply a permanent notice to be fixed by others to the outside of the machine room door with the following wording

LIFT MACHINE - DANGER - ACCESS FORBIDDEN TO ALL UNAUTHORISED PERSONS.

The notice shall be made form white ivorine or traffolyte with the characters not less than 25mm high.

LS.43.0 CIRCUIT LISTS

LS.43.01 Circuit lists shall be fitted to all distribution boards, lift controller and other equipment from which more than one circuit emanates.

LS.43.02 Generally the lists shall take the form of a heavy duty white card with the details typed on, and enclosed in a thick clear plastic envelope, and attached to the inside of the lid, doors or covers in an approved manner.

LS.43.03 Each circuit list shall indicate the number of M.C.B. or fuse way, the circuit description, location, the size reference number and rating of the M.C.B. or fuse.

LS.44.0 EQUIPMENT TO BE PROVIDED

LS.44.01 The following list of equipment is to be included in the contract.

LS.44.02 Rubber Mats in accordance with BS.921:1976.

Cont'd

LS.44.0 EQUIPMENT TO BE PROVIDED (Cont'd)

- LS.44.03 Instrument and test weights required for testing and commissioning.
- LS.44.04 25% spare fuses with a minimum of three of each type used in the installation.
- LS.44.05 Two spare M.C.B.s of each type and size used in the installation.
- LS.44.06 Four sets of service control keys for control over-ride switch specified in Clause LS.37.02 above.
- LS.44.07 Removable spokeless handwheel for hand winding the machine.
- LS.44.08 Removable brake release lever.
- LS.44.09 Door release hooks/keys for opening landing doors.
- LS.44.10 Two sets of keys for control panels, etc.
- LS.44.11 Special tools for maintenance purposes.

LS.45.0 LIFT SHAFT VENTILATION

- LS.45.01 The Lift Contractor shall check that ventilation is provided at the top of the lift shaft affording at least 1% of the lift shaft area in accordance with BS EN 81-1:1998.

LS.46.0 RECORD DRAWINGS

- LS.46.01 The Lift Contractor shall supply completed "as fitted" drawings for the works.
- LS.46.02 The draft set of drawing shall be supplied to the Contract Administrator for approval 28 days before the practical completion, and on receipt of such approval the final 'as fitted' drawings shall be supplied prior to the date of Practical Completion.

LS.47.0 SERVICE AND MAINTENANCE MANUALS

- LS.47.01 The Lift Contractor shall supply three properly hard bound 4 ring manuals with durable plastic covers and it shall contain:-

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LS.47.0 SERVICE AND MAINTENANCE MANUALS (Cont'd)

- (a) Description of the installation, itemising all components of the plant installed. Information shall be adequate to provide all information required for future in-service tests as specified in LG1:2006.
- (b) Description of how the plant operates, with full design details, together with a description of emergency action which should be taken in the event of a breakdown.
- (c) Complete Schematic Line Diagrams indicating the main features of the plant, the interconnection between various items, drawing attention to the method of setting the controls, switchgear etc. The Contract Administrator shall be consulted before the diagrams are finalised
- (d) Method of adjustment, typical fault finding routine and a complete set of wiring diagrams showing the various relay and semi-conductor modules and interconnection between these items. Wiring diagrams of all sub circuits and printed circuits shall also be included.
- (e) A description of the maintenance routine, oil and grease points and recommended lubricants.
- (f) Service manuals for all specialised plant, giving all details listed above, including a list of spares.
- (g) All the aforementioned burnt on to CD-ROM.

LS.48.0 INSPECTION AND TESTING

LS.48.01 All tests are to be carried out in the presence of the Contract Administrator and a member of the Employer's Insurers in accordance with the Lifts Regulations 1997 and shall be to the satisfaction of all parties.

LS.48.02 Seven days notice shall be given for the witness test to arrange the attendance of the Employers Insurers.

LS.49.0 MAINTENANCE

- LS.49.01 The Lift Contractor shall allow for routine inspection testing and maintenance of the lift installation during the Defects Liability Period which shall be carried out at bi-monthly intervals (i.e. every two months) or as indicated in the Appendices to this Specification Document.
- LS.49.02 The cost of this work shall be indicated separately on the Tender Analysis Form and the acceptance or otherwise of this cost will be at the discretion of the Contract Administrator.

LS.50.0 TUITION OF STAFF

- LS.50.01 The Lift Contractor shall allow for instructing the Employers' staff in the operation of all safety measures required to be carried out in the event of any abnormal conditions, i.e. loss of power, over running etc.
- LS.50.02 It may not be possible to arrange such instruction until the building is occupied therefore due allowance shall be made for a subsequent visit after Practical Completion.
- LS.50.03 Arrangements will be made by the Contract Administrator for the attendance of the appropriate Employers' staff.

APPENDIX A

To be completed for individual Specification

General Characteristics for Traction Lift

Lift Usage	: Transportation of passengers in medium to high rise buildings
No. of Cars	:
Load	:(320kg, 4 person) (400kg, 5 person) (450kg, 6 person) (630, 8 person) (800, 10 person) (1000, 13 person)
Speed	:m/s
Rise	:m
No. of Floors	:
No. of Entrances	:(Front) or (Front & Rear)
Control	:SAPB, DCL, FCL, Simplex, Duplex, Group
Drive	:Variable Frequency
Machine Room Location	:(Above)/(Below)/(Below at the Side)(Below at the Rear)
Starts per Hour	: No. (240), (150), (120) motor starts
Levelling Accuracy	: 3mm, 5mm, 20mm
Lift shaft Dimensions	: Width, Depth (mm)
Car Dimensions (inside)	: Width, Depth, Height (mm)
Type of Car/ Lift shaft Door	: 2-Speed, Centre Opening
Dimensions of Doors	: Clear Opening in mm 800, 900, 1100
Power Supply	: Voltage, Hertz

APPENDIX B

To be completed for individual Specification

General Characteristics for Hydraulic Lift

Lift Usage	: Transportation of passengers in low rise buildings
No. of Cars	:
Load	:(320kg, 4 person) (400kg, 5 person) (450kg, 6 person) (630, 8 person) (800, 10 person) (1000, 13 person)
Speed	:(0.25) (0.40) (0.63) (1.00).m/s
Rise	: m
No. of Floors	:
No. of Entrances	:(Front) or (Front & Rear)
Control	: SAPB, DCL, FCL, Simplex, Duplex
Drive	: Hydraulic Direct/Indirect with Solenoid/Advanced Valve
Machine Room Location	: Adjacent to the shaft at level : Remote from the shaft.
Starts per Hour	: No. 45, 60 motor starts
Levelling Accuracy	: 6mm
Lift shaft Dimensions	: Width, Depth (mm)
Car Dimensions (inside)	: Width, Depth, Height (mm)
Type of Car/ Lift shaft Door	: 2-Speed, Centre Opening
Dimensions of Doors	: Clear Opening in mm 700, 800, 900, 1100
Power Supply	: Voltage, Hertz

APPENDIX C

LS.C.01. FLOOR LANDING FIREMAN'S CONTROL

To be completed for individual Specification

LS.C.02. FLOOR CAR POSITION LANDING INDICATOR

To be completed for individual Specification

LS.C.03. FLOOR LANDING DIRECTIONAL ARROWS

To be completed for individual Specification

LS.C.04. CAR AND LANDING DOORS FINISHES

To be completed for individual Specification

LS.C.05. LIFT CAR FINISHES

To be completed for individual Specification

LS.C.06. MAINTENANCE FREQUENCY

To be completed for individual Specification