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Edgington Way
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*Lancaster
West Estate*

**HEALTH
&
SAFETY FILE
FOR
GRENFELL TOWER
LANCASTER WEST ESTATE,
LONDON W11 1TQ**



Registered in England No. 1129631



CST0000022/1

CST0000022_0001

**CONSTRUCTION PHASE
HEALTH
&
SAFETY PLAN**

SITE: GRENFELL TOWER

CONTENTS

1. HEALTH & SAFETY PLAN
2. PERMIT TO WORK
3. H.S.E. NOTIFICATION OF PROJECT F.10
4. PRE-QUALIFICATION QUESTIONNAIRE
5. INSURANCE DETAILS
6. DESIGN HAZARD CONTROL LOG
7. CONSTRUCTION HAZARD CONTROL LOG
8. HEALTH & SAFETY POLICY
9. RISK ASSESSMENTS
10. METHOD STATEMENTS
11. COSHH INFORMATION
12. HEALTH & SAFETY RECORD SHEETS
13. ACCIDENT/INCIDENT INVESTIGATION/REPORTS
14. PRE-TENDER HEALTH & SAFETY PLAN
15. PROGRAMME OF WORKS
16. SCOPE OF WORKS



PART FIVE

2

PRE-TENDER

HEALTH & SAFETY PLAN

3

Butler & Young Lift Consultants Ltd

INDEX - PART FIVE

HEALTH & SAFETY PLAN

No.	Title	Page No.
	Nature of Project	5/1
	Existing Environment	5/1
	Existing Drawings/Information	5/2
	The Design	5/2
	Construction Materials	5/8
	Site - Wide Elements	5/8
	The Residents	5/9
	Overlap with Undertaking	5/9
	Site Rules	5/9
	Continuing Liaison	5/9
	Declaration	5/10

PART FIVE

HEALTH & SAFETY PLAN

1. NATURE OF PROJECT

Client: The Royal Borough of Kensington & Chelsea
Tenant Management Organisation Limited
The Town Hall, Hornton Street, London, W8 7NX

Location: Grenfell Tower, Lancaster West Estate, London, W10

Nature of Construction work to be carried out:

Refurbishment of two electric passenger lifts and installation of one hydraulic passenger lift inclusive of all builders, electrical, structural and other attendant works.

Timescale for completion of Site Work: 70 weeks

2. EXISTING ENVIRONMENT

- **Surrounded land use and related restrictions.**

The building shall be fully occupied for the contract duration, see the Particular Specifications L2508.

Restrictions, if any, shall be discussed with Butler & Young Lift Consultants Ltd, the SO, and the Policy Authority.

- **Existing services (e.g. underground and overhead lines).**

Information shall be supplied by The Royal Borough of Kensington & Chelsea and co-ordinated by the SO.

- **Existing traffic systems and restrictions, e.g. access, delivery times, parking etc.**

Access shall be by prior arrangement only for street parking for immediate off loading.

The Principal Contractor shall be aware that the vehicle route around Grenfell Tower is a fire path and must be maintained free of any obstruction.

There shall be no space allocated for permanent provision of a skip.

The Principal Contractor shall appoint a nominated key holder for his storage and access areas.

- **Existing Structures/Plant, e.g. special health problems from existing materials which may be disturbed or require disposal, fragile materials, instability problems, etc.**

3. **EXISTING DRAWINGS/INFORMATION**

- **Available drawings of structure(s) to be demolished for incorporated, of new equipment.**

Installation drawings for the existing duplex lifts are available but all works shall be subject to the Principal Contractors detailed site surveys.

- **Available information on construction of materials to be removed.**

Not generally applicable but all works shall be subject to the Principal Contractors detailed site surveys.

4. **THE DESIGN**

The following check-list provides information on potential hazards associated with construction, operation, maintenance, decommissioning and demolition with specific examples. The list covers those items where hazards may be present and is based on such information as is available.

The list must be updated as necessary once the Principal Contractor has surveyed the site and produced the necessary risk assessment and method statements for the works. A detailed risk assessment may be required for aspects identified by this process and the hierarchy of risk control shall be followed.

Potential hazards

4.1 **Falls from a height.**

Examples:

Ladders, including machine room access arrangements,

Scaffold primarily within the lift shaft,

Shaft structural steelwork,

Falls from landing entrances or access doors, into the lift shaft,

Temporary working platforms,

Car top and platform,

Floors and surfaces generally,

Other areas highlighted during the Principal Contractor's site survey and determined by his Risk Assessment.

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Means of addressing the hazard in order to eliminate it or minimise the risk:

The works to the lifts shall be as defined in the Particular Specifications L2508.

Hoardings, barriers, harnesses and warning notices of hazards shall be in accordance with the Particular Specification, L2508.

Hard hats shall be worn at all times when working below a hazard.

Floors and surfaces shall generally be inspected for any possibility of slipping or sliding.

The Contractor shall assess the risk of relevant situations and ensure that a suitable method to solve these is implemented.

The Contractors safety policy document shall make reference to the Particular Specifications, L2508.

4.2 Struck by moving vehicle.

Examples:

Delivery van or delivery lorry with tail lift or crane facilities,

Other areas highlighted during the Principal Contractors site survey and risk assessment.

Means of addressing the hazard in order to eliminate it or minimise the risk:

The Principal Contractor shall provide a method statement for site access of delivery vehicles or his own or others construction vehicles identified during the course of the site works.

4.3 Struck by falling or flying objects.

Examples:

Routeing of equipment to and from the lift machine and pump room,

Preparation and trimming of landing entrances,

Working at other levels within the lift shaft,

Other areas highlighted during the Principal Contractors site survey and risk assessment.

Means of addressing the hazard in order to eliminate it or minimise the risk:

Hard hats and other PPE shall be worn for hazardous areas and operations,

Blanking of holes within the machine room floor, as practical,

Close boarding the scaffolded lift shaft,

Safety precautions as the Particular Specifications, L2508.

4.4 Contact with electricity or an electrical discharge.

Examples:

Control panels/switchgear/electrical panels etc.,

Hand tools or hand lamps,

Lighting fittings,

Other areas highlighted during the Principal Contractors site survey and risk assessment.

Means of addressing the hazard in order to eliminate it or minimise the risk:

All switching requirements shall be referred to the SO,

Restrictions on live working shall be applied,

Hand tools and temporary lighting shall be 110volt.

Refer to Particular Specifications, L2508, relevant to Health and Safety Policy.

4.5 Access for physical installation, construction and maintenance.

Examples:

Removal of redundant equipment through shaft, hatches and the site generally,

Delivery of new equipment through shaft, hatches and the site generally,

Personnel access to the lift shaft and machine room during construction and subsequent maintenance,

Other areas highlighted during the Principal Contractors site survey.

Means of addressing the hazard in order to eliminate or minimise the risk:

Hard hats shall be worn as applicable,

Hoardings at shaft landing entrances with applicable signs,

Safe method of machine room access with security locking.

Refer to relevant clauses of Particular Specifications, L2508.

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4.6 Contact with moving machinery or material being machined

Examples:

Lift machine,

Sheaves and diverters

Grinders and cutters,

Other areas highlighted during the Principal Contractor's site survey and risk assessment.

Means of addressing the hazard in order to eliminate it or minimise the risk:

Lift machine shall be adequately guarded,

Protective clothing and glasses shall be worn to minimise risk. Personnel using hand tools should be adequately trained,

Refer to Health & Safety requirements in Particular Specifications, L2508.

4.7 Trapped by plant collapsing or overturning.

Examples:

Scaffolding collapse,

Vehicles falling from supports/overturning,

Plant, including lifting machinery,

Other areas highlighted during the Principal Contractors site survey and risk assessment.

Means of addressing the hazard in order to eliminate it or minimise the risk:

Vehicles shall be suitably stabilised during equipment movement,

Lifting or hoisting plant shall have current test certificates and instruction on use.

Hoardings, scaffolding and boarding shall be as Specification requirements,

4.8 Exposure to hot or harmful substance.

Examples:

Asbestos,

Dust, (grinding, cutting, drilling),

Lead paint removal,

Hot works generally,

Chemicals stored on site, (paints, specialist cleaning).

Means of addressing the hazard in order to eliminate it or minimise the risk:

Protective clothing and glasses shall be worn at all times,

All operatives shall be adequately trained specific to the operations,

Adequate secure storage shall be provided as required,

Adequate ventilation shall be provided for specific processes,

Hot works permit shall be issued by the Royal Borough of Kensington and Chelsea.

4.9 Manual handling.

Examples:

Off loading plant,

General lifting and movement of plant and equipment,

Manual demolition tasks,

Other tasks specific to the method of site working.

Means of addressing the hazard in order to eliminate it or minimise the risk:

All operatives shall be trained in relevant tasks,

One engineer shall be in overall control of all lifting and movement tasks,

Reference shall be made to the Particular Specifications, L2508 and Safety rules.

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4.10 Hygiene aspects generally.

Examples:

Contamination of the existing lift installations,

Accumulation of dust and oil,

Asbestos removal.

Means of addressing the hazard in order to eliminate it or minimise the risk:

The installation shall be cleaned down, all waste materials removed and disposed of, and the areas disinfected prior at the start of site works and prior to installation of any materials or equipment.

4.11 Exposure to noise.

Examples:

Grinding/cutting/drilling,

Pneumatic drilling/breaking.

Means of addressing the hazard in order to eliminate it or minimise the risk:

Ear defenders and specific protective equipment shall be available and used.

Times and details of noise restrictions shall be agreed with client.

Detailed Method Statement required from Principal Contractor.

4.12 Structural Implications of the Design.

Shall be discussed between the Principal Contractor and the Planning Supervisor.

4.13 Fire Alarm Systems.

The Principal Contractor shall protect any smoke detector systems and be aware of operation.

5. CONSTRUCTION MATERIALS

- **Health hazards arising from construction materials where particular precautions are required. Applicable only where such hazards cannot be avoided or designed out.**

5.1 Hazardous Materials

Any materials that are specified for use during construction and are considered to present a level of risk that is manageable and controllable during their application and use and, where applicable, during their subsequent presence as part of the completed installation are to be listed. Prior to use the Principal Contractor shall provide a separate COSHH assessment for each of these. Unless otherwise stated, the materials selected are in general use within the construction industry and been chosen to minimise, so far as is reasonably practicable, risks to health and safety:

Paint, cellulose, french polish, oil, grease and others subject to the Principal Contractor's site surveys.

Materials that are considered to be essential for effective maintenance of the facility and contain substances that may be considered as hazardous to health are to be listed.

The Principal Contractor shall provide a separate COSHH assessment for each of these. Unless otherwise stated, the materials selected are in general use within the construction industry and been chosen to minimise so far as is reasonably practicable, risks to health and safety:

6. SITE-WIDE ELEMENTS

- **Access and egress points (e.g. for deliveries and emergencies).**

The Ground level and street approach to the building and external staircase access plus the rear access point to the Walkway level, all to be agreed with the SO.

- **Location of temporary site accommodation.**

To be agreed with the SO.

- **Location of unloading, layout and storage areas.**

On the Walkway level together with the hoardings and the machine or pump room, or as agreed with the SO.

- **Traffic/pedestrian routes and method of segregation.**

To be agreed with the SO.

7. THE RESIDENTS

- Risk to vulnerable residents due to loss of lift service plus potential of losing all lift service in the event of the occasional failure of the remaining lift.
- Means are included within Specification L2508 to mitigate the risks of lift failure viz:
 - Re-testing and overhauling the lift which is designated to be refurbished in the second phase.
 - Maintaining an enhanced supply of spare parts on site, utilising materials removed during the first phase of the refurbishment.
 - Specifying special arrangements for rapid response to breakdowns.
 - Examining possibility of permanent standby engineers.
- The Royal Borough of Kensington & Chelsea Tenants Management Organisation Ltd shall examine soft issue solutions such as portage, assistance with shopping or buggies etc.
- Design and instigate a lift failure plan.

8. OVERLAP WITH THE ROYAL BOROUGH OF KENSINGTON & CHELSEA TENANT MANAGEMENT ORGANISATION UNDERTAKING

- **Consider health and safety issues for working in occupied or partly occupied premises (e.g. fire/evacuation procedures).**

Comply with all The Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd Health & Safety Policy, other documentation and the Particular Specifications, L2508.

9. SITE RULES

- **Specific site rules required as a result of points 2 to 8 above, e.g. permit to work, emergency procedures), any others required by Health and Safety Legislation, e.g. RIDDOR (Reporting of Injuries and Dangerous Occurrences).**

Comply with The Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd Health & Safety Policy and the Particular Specifications, L2508.

10. CONTINUING LIAISON

- **Procedures for considering health and safety implications of design elements of the principal contractor's and other contractor's packages.**

Refer to Particular Specifications, L2508.

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- **Procedures for dealing with unforeseen eventualities during project execution resulting in substantial design change and which might affect resources.**

The principal contractor shall liaise with all parties to ensure his development of the Health Safety Plan.

All relevant information for the Health and Safety Plan shall be incorporated in the Health, Safety File, including "as built" drawings and maintenance manuals and returned to the Planning Supervisor at the end of the contract.

11. DECLARATION BY THE PLANNING SUPERVISOR

The above plan has been prepared in relation to the stated design element of the project. Inclusion of potential hazards addressed within the plan has taken account of the proposed contractual arrangements and the nature and stature of the Principal Contractor and his sub-contractors. The hierarchy of risk control has been followed and where possible the hazard has been designed out or risks minimised by the methods stated.

Signed

Date 25th May 2004

For and on behalf of BUTLER & YOUNG ASSOCIATES
and acting in the capacity of Planning Supervisor

APEX LIFTS

APEX LIFTS
APEX HOUSE, LEFA BUSINESS PARK
EDGINGTON WAY
SIDCUP, KENT DA14 5BH
TELE: [REDACTED]
FAX: [REDACTED]

PERMIT TO WORK

1. Issue to.....of.....
The following equipment has been made safe to carry out the work detailed below:
Equipment description
Equipment location
Electrical supplies isolated at
Caution notice displayed at
Danger notices displayed at
Work to be carried out

All other equipment is dangerous

Specific precautions to be taken (Contractor to identify)

This permit is valid only to: Time..... Date.....
Signed:
Dated:
Name (printed)

2. Receipt I have understood the above, I will return this permit to the issuer on completion or suspension of the work or at the termination of the validity.
Signed Time.....
Name (printed) Date.....

3. Clearance The working party is withdrawn
The equipment status is: (delete as appropriate)
a. Work complete; tools and materials are removed; covers and barriers replaced.
b. Work incomplete; re-instated usable
c. Work incomplete not usable; safety precautions applied
Signed Time.....
Name (printed) Date.....

4. Cancellation this permit is hereby cancelled
Signed..... Name (printed)..... Date..... Time.....



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2

Notification of Project

Note

1. This form can be used to notify any project covered by the Construction (Design and Management) Regulations 1994 which will last longer than 30 days or 500 person days. It can also be used to provide additional details that were not available at the time of initial notification of such projects. (Any day on which construction work is carried out (including holidays and weekends) should be counted, even if the work on that day is of short duration. A person day is one individual, including supervisors and specialists, carrying out construction work for one normal working shift).
2. The form should be completed and sent to the HSE area office covering the site where construction work is to take place. You should send it as soon as possible after the planning supervisor is appointed to the project.
3. The form can be used by contractors working for domestic clients. In this case only parts 4-8 and 11 need to be filled in.

HSE - For official use only

Client	V	PV	NV	Planning supervisor	V	PV	NV
Focus serial number				Principal contractor	V	PV	NV

1. Is this the initial notification of this project or are you providing additional information that was not previously available

Initial notification

Additional notification

2. Client: name, full address, postcode and telephone number (if more than one client, please attach details on separate sheet)

Name: The Royal Borough of Kensington & Chelsea
Address: Tennant Management Organisation
Town Hall
Hornon Street

Telephone Number: [REDACTED]

Postcode: W8 7NX

3. Planning Supervisor: name, full address, postcode and telephone number

Name: Butler & Young Associates
Address: 1st Floor
54-62 Station Road East
Oxted
Surrey

Telephone Number: [REDACTED]

Postcode: RH8 0PG

4. Principal Contractor (or contractor when project for a domestic client) name, full address, postcode and telephone number

Name: Apex Lift & Escalator Engineers Ltd
Address: Apex House
LEFA Business Park
Edgington Way
Sidcup
Kent

Telephone Number:

Postcode: DA14 5BH

5. Address of site: where construction work is to be carried out

Address: Grenfell Tower
Lancaster West Estate
London

Postcode: W11

6. Local Authority: name or the local government district council or island council within whose district the operations are to be carried out.

Royal Borough of Kensington & Chelsea

7. Please give your estimate on the following: Please indicate if these are original revised (tick relevant box)

a. The planned date for the commencement of the construction work

b. How long the construction work is expected to take (in weeks)

c. The maximum number of people carrying out construction work on site at any one time.

d. The number of contractors expected to work on site.

8. Construction work: give brief details of the type of construction

Refurbishment of two electric passenger lifts and the installation of one hydraulic passenger lift including the construction of a new machine room.

9. Contractors name, full address and postcode of those who have been chosen to work on the project (if required continue on a separate sheet). (Note this information is only required when it is known at the time notification is first made to HSE. An update is not required).

Declaration of planning supervisor

10. I hereby declare that Butler & Young Associates (name and organisation) has been appointed as planning supervisor for the project.

Signed by or on behalf of the organisation  (print name) J Bryce

Date: 15 December 2004

Declaration of principal contractor

11. I hereby declare that Apex Lift & Escalator Engineers Ltd (name of principal contractor) has been appointed as principal contractor for the project (or contractor undertaking project for domestic client)

Signed by or on behalf of the organisation  (print name) G Poynter.

Date 20-12-2004

APEX LIFTS

**APEX LIFT & ESCALATOR
ENGINEERS LIMITED**

HEALTH & SAFETY

**PRE-QUALIFICATION
QUESTIONNAIRE**

Préface

To enable an assessment of the "competency" of your organisation to undertake work(s) in accordance with Health and Safety legislation, including the Health and safety at Work Act 1974, the Management of Health and safety at Work regulations 1992 and the Construction (Design and Management) Regulations 1994 (CDM), will you please complete the following questions. Where appropriate, your response should be supported by relevant materials.

Important

- (1) Please read the questions very carefully as we are attaching a score to the responses received. If the answer does not cover all the points raised in the question, we will be unable to score it correctly.
- (2) Responses that do not answer the question will be scored zero.

APEX LIFTS

ORGANISATIONAL DETAILS		
1. REGISTERED NAME: Apex Lift & Escalator Engineers Limited		
2. REGISTERED NUMBER: 1129631		
3. REGISTERED OFFICE: Apex House LEFA Business Park Edgington Way Sidcup Kent. DA14 5BH		
4. OTHER TRADING NAME(S): None		
5. LEGAL FORM OF ORGANISATION: Lift Manufacturers, Installers, Maintenance and Repairs of Lifts.		
6. ADDRESS (for tendering purposes): Apex House LEFA Business Park Edgington Way Sidcup Kent. DA14 5BH		
TELEPHONE No: [REDACTED]	FACSIMILE No: [REDACTED]	
7. CONTACT(S) TITLE AND DIRECT LINE NUMBER(S) IN THE EVENT OF ANY QUERY REGARDING QUESTIONNAIRE INFORMATION:		
NAME: [REDACTED]	TITLE: [REDACTED]	TELEPHONE No: [REDACTED]
8. DO YOU HAVE THE FOLLOWING INSURANCE COVER:		
Employers compulsory Liability Insurance	YES	NO
Public Liability Insurance	YES	NO
Professional Indemnity Insurance	YES	NO
If yes please provide verification copies	Enclosed	
9. WHAT TYPE OF WORK/PROJECT VALUES DO YOU WISH TO BE CONSIDERED FOR: Lift refurbishment, installations, modernisations, repair and service of lifts and escalators £50.00 to £1,000,000.00 plus		

HEALTH AND SAFETY		
1. HAVE YOU PREPARED A HEALTH AND SAFETY POLISY STATEMENT?		
		YES NO
2. HAS YOUR ORGANISATION A DOCUMENTED MANAGEMENT SYSTEM COVERING SAFETY?		
(If yes state to which (if any) standards it relates and provide a photocopy of index)		YES NO
		BSEN ISO 9001
3. HAVE YOU APPOINTED A PERSON AS SAFETY ADVISOR OR SIMILAR TITLE?		
		YES NO
(If yes please state name(s) titles and to whom in the organisation they report and provide photocopies of any relevant organisation chart)		
NAME	TITLE(S)	REPORTING TO
James Palmer	Health, Safety, Environmental Officer	Managing Director Mr W Jenchner
Mr T Potter	LEIA Safety & Training Manager	Managing Director Mr D Frazakerley
Mr J Nicholls	L.I.T.S safety Manager	Managing director
4. HAS YOU ORGANISATION BEEN SUBJECTED TO ANY SAFETY AUDITS BY OTHERS (2 nd OR 3 rd PARTY)		
		YES NO
IF "YES" PLEASE PROVIDE DETAILS AND DATES		
London Borough of Lewisham January 1997		
LEIA Audit 1999		
5. HAS YOUR ORGANISATION HAD (OR HAVE OUTSTANDING) PROSECUTIONS, PROHIBITION NOTICES OR IMPROVEMENT NOTICES INSTIGATED BY HEALTH AND SAFETY EXECUTIVE OR OTHER ENFORCING AUTHORITIES, E.G. FIRE?		
		YES-NO
IF "YES" PLEASE PROVIDE DETAILS		
Not Applicable		

PERSONNEL:
1. DO YOUR PERSONNEL RECEIVE HEALTH AND SAFETY TRAINING? <p style="text-align: right;">YES NO</p>
IF "YES" PLEASE PROVIDE DETAILS OF TRAINING SYLLABUS On a regular basis we hold Health and Safety training meetings on sites and at our offices on various aspects of Health and Safety, Risk Assessments, Safe Working Practices, First Aid and Site Conditions
2. HOW DO YOU ENSURE ONLY APPROPRIATELY QUALIFIED, EXPERIENCED AND / OR TRAINED PERSONNEL UNDERTAKE SPECIFIC TASKS? All our engineers have carried out a full three year CITB training programme and the current improvers and apprentices are on the NVQ3 which is monitored by L.I.T.S and all have attended the first aid appointed persons course. An ongoing training programme is in place with courses held at our offices and at various venues as required for all employees with a great deal of on site training to pass on the information gained to all personnel
3. PLEASE PROVIDE DETAILS OF THE NUMBER OF PERSONNEL YOU EMPLOY, TOGETHER WITH THEIR APPROPRIATE SKILLS MIX, PROFESSIONAL ASSOCIATIONS: Details supplied on request.

SUB-CONTRACT CONTROLS:

1. DO YOU ASSESS THE COMPETENCY OF YOUR SUB-CONTRACT (S)

YES NO

IF "YES" PLEASE PROVIDE DETAILS OF HOW THIS IS ACHIEVED

All sub-contractors will be required to issue their Health and safety policy and to abide by our plan.

All sub-contractors will be required to attend a safety induction course on site.

Site safety assessments will be carried out to monitor changing risks and a copy will be held in the site Health and Safety file with copies of any risk assessments carried out sent to each employee and sub-contractor, with copies held in various sections of the Health and safety file.

We do not envisage using any sub-contractors.

2. HOW DO YOU CONTROL THE INTERFACE(S) BETWEEN YOUR SUB-CONTRACTOR(S), INCLUDING THE TRANSFER OR RELEVANT INFORMATION?

The Contract Manager will be responsible for controlling the site works and will be in daily contact with the sub-contractors, with any paperwork delivered day by day.

SUBCONTRACTOR CONTROLS (CONTINUED)
3. HOW DO YOU ENSURE YOUR SUB-CONTRACTOR(S) ONLY EMPLOY APPROPRIATELY QUALIFIED, EXPERIENCE AND TRAINED STAFF TO UNDERTAKE SPECIFIC TASKS?
<p>We will issue this Health and Safety questionnaire to all prospective sub-contractors to help with our assessments.</p>

QUESTIONNAIRE COMPLETED BY:	
NAME:	JAMES PALMER
SIGNATURE:	<i>J. Palmer</i>
JOB TITLE:	ENV./H&S/QA OFFICER
DATE:	23-09-04

APEX LIFTS

Wood & Craven Ltd

Insurance Brokers

27 Park Street, Lytham,
Lancashire FY8 5LU

Telephone [REDACTED]

Fax [REDACTED]

email [REDACTED]

www.wood-and-craven.co.uk

**WOOD &
CRAVEN**

TO WHOM IT MAY CONCERN

14th June, 2004

Dear Sirs,

APEX LIFT AND ESCALATOR ENGINEERS LTD

We can confirm that we act as Insurance Brokers to the above company who hold the following covers.

Employers Liability

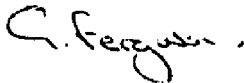
Cover is with D A Constable Syndicate Policy No. A1020999. Limit of Indemnity is £10 million and cover includes full Indemnity to Principal. Cover is effective from 20.6.04 to 31.8.2005.

Public/Products Liability

Primary cover is with D A Constable Syndicate Policy No. A1021000. The Limit of Indemnity is £5 million. There is no inner limit for removal of supports etc. The cover includes full Indemnity to Principal. Cover is effective from 20.6.04 to 31.8.2005.

There is an excess liability policy of £5 million in excess of £5 million provided by Ahacus, Policy No. 53695A04. Cover is effective from 1.4.04 to 31.8.05.

Yours faithfully,
WOOD & CRAVEN LTD.



G W Ferguson



Registered in England No. 3098666
Registered office: 27 Park Street, Lytham FY8 5LU

LLOYD'S

Certificate of Employers' Liability Insurance (a)

(Where required by regulation 5 of the Employers' Liability (Compulsory Insurance) Regulations 1998 one or more copies of this certificate must be displayed at each place of business at which the policy holder employs persons covered by the policy).

Policy Number A4020999

1. Name of policy holder. **APEX LIFT & ESCALATOR ENGINEERS LIMITED**
2. Date of commencement of insurance policy. **20/06/2004**
3. Date of expiry of insurance policy. **31/08/2005**

We hereby certify that subject to paragraph 2:-

1. the policy to which this certificate relates satisfies the requirements of the relevant law applicable in Great Britain Northern Ireland and the Channel Islands or the Isle of Man or in connection with offshore installations within the Continental Shelf around those countries (b); and
2. (a) the minimum amount of cover provided by this policy is no less than £5 million (c);

Notes

- (a) Where the employer is a company to which regulation 3(2) of the Regulations applies, this certificate shall state in a prominent place, either that the policy covers the holding company and all its subsidiaries or that the policy covers the holding company and all its subsidiaries except any specifically excluded by name, or that the policy covers the holding company and only the named subsidiaries.
- (b) Specify applicable law as provided for in regulation 4(6) of the Regulations.
- (c) See regulation 3(1) of the Regulations and delete whichever of paragraphs 2(a) or 2(b) does not apply. Where 2(b) is applicable, specify the amount of cover provided by the relevant policy.

Paragraph 2(b) does not apply and is deleted.

Signed on behalf of **D A CONSTABLE SYNDICATE LIMITED** (Authorised Insurers)



.....
(Signature)

Design Hazard Control Log



Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date	Issue: 1	Sheet: 1 of 10
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Hazard Identification and Analysis				Preventative Action Record		
Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
1	Working on car top	Falling	Design a harness anchorage point to the car top sling	Entanglement with harness and fixed objects	Si, O&M, Con, D, Com	To ensure the lift is not moved until the harness/equipment is made clear, with direction of travel only in the <u>down direction</u> . <u>Note:</u> Length of sling restricted to one metre.
		Crushing	Design lift with an up test limit as BS with a limited headroom notice on car top and ensure runbys as BS. <u>Fit extra test limit to operate off separate ramp.</u> Buzzer to operate on up test. Warning light top of shaft to operate on up test.	Negligible	CON, COM & O&M	Work on car top as our safe working practices. To ensure that the test limit is not moved. Limits to be pinned and notices applied to limits to read: TEST LIMIT NOT TO BE MOVED

CST00000022/43

Design Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue:	Sheet: 2 of 10
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Hazard Identification and Analysis	Preventive Action Record
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Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase <small>SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning</small>	Proposed Action to Control Remaining Risk by Contractor
1	Working on car top (cont)	Electric Shock	Design for the minimum of electrical equip fitted to the car top, with as many items as possible using low voltage on the car top and within shaft.	Electric shock	SI Con D Com	To ensure the supply is switched off when working on the car top.
				Negligible	O & M	
		Entanglement	To design guards over revolving machinery, ensure moving parts are painted safety yellow. Design out as many protruding parts within the lift shaft as possible.	Negligible	O & M	To ensure guards are replaced and safety clothing is worn.

CST00000022/44

Design Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 3 of 10
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Hazard Identification and Analysis			Preventative Action Record			
Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
2	Removal of car enclosure	Falling	Design for the works to be carried out at the ground floor.	Negligible	Con D	To ensure protective clothing is worn and works carried out as our safe working practices.
		Crushing	Design for the size of material to be removed as small as possible with lifting equipment for larger sections	Negligible	Con D	To ensure only light/small sections are removed at any one time or lifting equipment for the larger sections.
		Electric Shock	Arrange for the power supply to be switched off and isolated	Negligible	Con D	To ensure the supply is isolated before removal of the car enclosure and protective clothing worn.

CST0000022/45

Design Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 4 of 10
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Hazard Identification and Analysis				Preventative Action Record		
Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
3	Cleaning shaft steelwork	Respiratory Problems	Arrange for the use of respirators	Respiratory problems negligible	Con D	To ensure the hoardings are locked, with the use of respirators.
	Removal and replacement of landing entrances And guide rails	Falling	Arrange for hoardings and safety barriers at the floors where works are to be carried out.	Negligible	Con D	To ensure the hoardings are locked with danger notices and safety barriers used.
		Crushing	Arrange for the items of equipment to be of a manageable size and weight with any lifting equipment that is required.	Negligible	Con D	To ensure the hoardings are locked, all protective clothing is worn and work is carried out as our safe working practices. Ensure scaffolding is correctly installed

CST00000022/46

Design Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 5 of 10
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Hazard Identification and Analysis				Preventative Action Record		
Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
5	Removal and replacement of the suspension ropes.	Falling	Arrange for the lifting equipment to have the appropriate test certificate, with certificates for the new ropes.	Negligible	Con D	To ensure the safety equipment is in good working order with works carried out as our safe working practices.
6	Removal and replacement of the machine room equipment	Electric shock	Arrange for a lockable mains isolator with a control panel insulating mat.	Negligible	SI Con Com O&M D	To ensure the power supply is isolated and locked off before any works are carried out.

CST00000022/47

Design Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 6 of 10
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Hazard Identification and Analysis				Preventative Action Record		
Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
6	Removal and replacement of the machine equipment (cont)	Crushing	Arrange for all the lifting equipment to be tested or have the appropriate certificate for the equipment i.e. (beams) use of safety barriers with notices.	Crushing	Con D	To ensure all works are carried out as our safe working practices with certificates for the lifting equipment.
7	Installing new lift car.	Falling	Arrange for the works to be carried out at the ground floor.	Negligible	Con	To ensure protective clothing is worn and works carried out as our safe working practices.

CST00000022/48

Design Hazard Control Log

APIX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 7 of 10
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Hazard Identification and Analysis	Preventive Action Record
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Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site Investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
7	Installing new lift car (cont).	Crushing	Design the size of material to be installed as small as possible And lifting equipment or larger items.	Negligible	Con	Ensure only light small sections are installed by hand or lifting equipment used.
		Electric shock	Arrange for the power supply to be switched off and isolated.	Negligible	Con	Ensure the supply is isolated before carrying out the installation of the lift car.

CST00000022/49

Design Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 8 of 10
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Hazard Identification and Analysis				Preventative Action Record		
Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
8	Installing new cabling and switches to car / shaft and landings	Falling	Arrange for when working on the car top the use of a safety harness with the supply isolated.	Negligible	Con Com O&M	Ensure the harness is used with the supply isolated.
		Crushing	Design for the size of material to be fitted as small as possible.	Negligible	Con Com O&M	Ensure protective clothing is worn and works carried out as our safe working practices.
		Electric Shock	Arrange for the power supply to be switched off and isolated as required.	Negligible	Con Com O&M	Ensure the supply is isolated.

CST00000022/50

Design Hazard Control Log



Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 9 of 10
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Hazard Identification and Analysis				Preventative Action Record		
Action No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
9	Adjusting testing commissioning	Falling	Arrange for the test engineer to use a safety harness when working on the car top.	Negligible (Entanglement with harness and fixed objects).	Con Com O&M	To ensure the lift is not moved until the harness/equipment is made clear, with direction of travel only in the <u>down direction</u> .
		Crushing	Arrange for the test limit to be tested and the runbys checked to meet BS.	Negligible		Con Com O&M

CST00000022/51

Design Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 10 of 10
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Hazard Identification and Analysis	Preventive Action Record
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n No.	Hazard or Activity Description	Description of Risk	Action Taken by Designer to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
9	Adjusting testing commissioning (cont)	Electric shock	Design for the minimum of electrical equipment on the car top / shaft with as much equipment as possible using low voltage.	Electric shock negligible.	Con Com O&M	Ensure the supply is switched off when working on the car top and isolated.
		Entanglement	Design guards over revelling machinery and arrange for moving parts to be painted safety yellow.	Negligible	Con Com O&M	Ensure guards are replaced and safety clothing is worn.

CST00000022/52

Construction Hazard Control Log

APEX LIFTS

Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 1 of 2
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Hazard Identification and Analysis	Preventative Action Record
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Action No.	Hazard or Activity Description	Description of Risk	Action To be taken by Contractor	Responsible Party	Date Required Week	Action Taken	Date	Signature
1	Dismantle car enclosure	Falling	To carry out works at ground floor	Apex Engineer		Carry out work at lowest floor		
2	Temporary Push button	Electric shock	To ensure supply is isolated	Apex Engineer		Supply switched off and isolated		
3	Cleaning of shaft	Respiratory problems	To use respirators	Apex Engineer		Work carried out using face masks		
4	Dismantle and install landing equipment	Falling	To ensure a hoarding is fitted and locked	Apex Engineer		Hoardings locked		
5	Buffer CWT and suspend Car frame	Falling and entanglement	To ensure the tackle and equipment are in good order.	Apex Engineer		Use tackle and equipment		
6	Remove ropes and motor room equipment then install new	Falling and electric shock	To ensure barriers and the supply is isolated.	Apex Engineer		Isolated the main supply and used local barriers		
7	Install new car frame and rope etc	Falling	To ensure tackle and guarding are in good order.	Apex Engineer				

Construction Hazard Control Log



Project DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited	Date:	Issue: 1	Sheet: 2 of 2
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Hazard Identification and Analysis

Preventative Action Record

Action No.	Hazard or Activity Description	Description of Risk	Action To be taken by Contractor	Responsible Party	Date Required Week	Action Taken	Date	Signature
8	Install shaft switch gear etc	Electric shock	To ensure supply is isolated.	Apex Engineer				
9	Install car complete	Falling and Electric shock	To ensure supply is isolated and carry out works at ground floor.	Apex Engineer				
10	Complete controller connections and testing	Electric shock and entanglement	To ensure control panel mat and isolate when possible and ensure guards are fitted.	Apex Engineer				
11	Using the car top and platform as working platform	Lift moving without notice Crushing	To ensure the safety gear operating equip, and rope is retained. That the stop switch is operational on the control buttons with an overload device. A stump for overhead protection is fitted under the counterbalance weight.	Apex Engineer		Carry out works as per instructions keeping the safety gear operating equip. Kept the overload device with a stop switch on the control button station.		

APEX LIFTS

**APEX LIFT
&
ESCALATOR ENGINEERS
LIMITED**

GENERAL POLICY STATEMENT

ON

**HEALTH & SAFETY AT WORK
ACT – 1974**

APEX LIFT AND ESCALATOR ENGINEERS LIMITED**CONTENTS**

Section		Page
1.0	GENERAL POLICY STATEMENT	3
2.0	ORGANISATION	5
	COMPANY HEALTH & SAFETY ARRANGEMENTS – Contact	
3.0	ARRANGEMENTS	10
3.1	Procedures Precautions and Safe Systems at Work	10
3.2	Accidents and Occurrences Riddor 1995	
	3.2.1 Reporting Procedures	10
	3.2.2 Investigating Procedures	11
3.3	Personal and Protective Equipment – (PPE) 1992	11
3.4	Welfare Facilities -	11
	Workplace (Health Safety & Welfare 1992)	
3.4	Construction (Health Safety & Welfare) Regulations 1996	
3.5	Machinery and Substances	12
	3.5.1 Machinery PUWER 1998 LOLER 1998	12
	3.5.2 Substances COSHH 1999	13
3.6	Special Risks	13
3.7	Emergency Procedures	14
3.8	Communication	14
3.9	Safety representation & Safety Committee Regulations 27	
3.10	Trainee	15
3.11	Management of Health & Safety at Work Regulations 1999	16
3.12	Common Hazards	17
3.13	Display Screen Equipment (DSE) 1992	17
3.14	The Construction (Design & Management) Regulations 1994	18

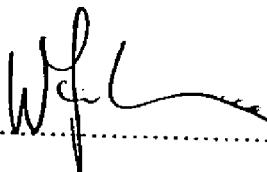
HEALTH & SAFETY AT WORK ACT 1974**1.0 GENERAL POLICY STATEMENT**

1. The Board of Directors of Apex Lift & Escalator Engineers Ltd regard the promotion, maintenance and improvement of Health, safety and Environmental standards as one of its declared objectives.
2. Section 2 (3) of the health and safety at work Act 1974, imposes a duty on every company employing five or more persons to prepare, and as appropriate revise a written statement of his general policy with respect of the Health and Safety at Work of his employees. The statement and any revision of it will be brought to the notice of all company employees.
3. It is therefore this Company's policy to do all that is reasonable practicable to prevent personal injury and ill health and damage to property and to protect everyone from foreseeable work hazards including the Sub-Contractors and the public in so far as they come into contact with the Company or its products. The Company will ensure a healthy environment and will comply with any and all applicable legal and other requirements.
4. In particular the Company will:-
 - a) Provide and maintain safe equipment and safe systems of work with healthy working conditions taking account of any legal requirements.
 - b) Provide instructions, training, supervision and necessary information to enable employees to perform their work safely and efficiently.
 - c) Provide adequate funds and resources to meet administrative, investigative, progressive and practical requirements of the policy.
 - d) Safe handling, storage, maintenance and transport of articles and substances.
 - e) Make available all necessary safety devices and protective equipment and supervise their use.
 - f) As far as reasonably practicable, to maintain a safe place of work with safe access.
 - g) Provide a safe working environment with adequate Welfare Facilities.
 - h) Maintain a constant and continuing interest and improvement in Health and Safety and Environmental matters applicable to the Company's activities, in particular, by consulting and involving employees and their representatives, ensuring that the company comply with all applicable legislation.

HEALTH & SAFETY AT WORK ACT 1974

5. It is realised the statutory requirements may not cover all the Company's Health and Safety Risks, therefore it is necessary to monitor the risks and endeavour to calculate and eliminate or reduce potential accidents or health hazards. The Health and Safety Policy will be audited and updated following consultation with the Safety Officer LEIR and EEF South. Any changes made to the Safety Policy will be notified to all employees.
6. Employees have the responsibility :-
 - To take steps for Health and Safety of himself and of other persons who may be affected by his acts or omissions at work.
 - To co-operate with the company so far as is necessary to enable any duty or requirement to be complied with.
7. All employees are issued with an Employees Manual with a copy of the Apex Lift and Escalators Ltd, Health and Safety Policy with updates, which all employees sign for as proof of receipt.
8. The policy is reviewed annually or as new legislation is brought in.
9. Directors, Managers, Supervisors and all employees are made aware of the legal penalties and duties on a regular basis.
10. The Apex Lift Health and Safety consultant is Lift and Escalator Industry Association LITS and the EEF South.

Signature of Managing Director



..... W. Jenchner

HEALTH & SAFETY AT WORK ACT 1974

2.0 ORGANISATION

The organisation of the Company is formed for works in the field of vertical transport and is headed by The Chairman and the Directors.

The Managing Director is overall responsible and accountable to the Board of Directors for the safety performance of the Company.

The Company Environmental, Health, Safety, Quality Manager, is accountable to the Managing Director for implementing, monitoring and recommending improvement or changes to the Health and safety Policy. His/Her responsibility includes ensuring that resources are made available and the risk assessments are carried out and safety systems of work are developed and affected. He/She shall monitor all safety inspections at the office/works and on sites.

Managers are accountable to their Director for implementing the Company's General Health and safety Policy. The Manager will, through supervision, enforce the safety policies of the company and carry out the following duties:-

- Recommend to the Board, improvements or changes in Health and Safety practices and to recommend priorities.
- Interpret the policies of the board to supervisors and ensure that they are understood and implemented effectively.
- Work with technical staff and Health and safety advisors in reviewing, inspecting and improving work systems and the object of improving Health and Safety performance.
- Monitor the work of supervisors and stimulate their interest and involvement in safety.
- Review reports and statistics and investigate any negative performance prior to taking correct action.
- Take part in particular investigations of hazards and accidents as required.
- Ensure adequate Health and Safety training is given for their staff.

They will carry out safety inspections at the office/works and on site.

Each Manager is responsible for their departments and personnel's Health and Safety as detailed in the current organisation structure. Each Manager is responsible to ensure their department; personnel carry out works in compliance with the CDM Regulations 1994. Each Manager is trained as an appointed person first aider HS (First Aid) requirements 1981.

A training record is kept for each Manager to monitor their competence with training given as required.

All Managers will be made aware of all emergency procedures and ensure his department is made familiar with them.

APEX LIFTS

Supervisors are accountable to their Manager for the day to day operation of the Company's General Health and Safety Policy. The Supervisor will be responsible to the discipline and enforcement of safety procedures and safe working practices. Other duties include:-

- Monitoring the work of those he is responsible for.
- The elimination of reduction of risks as far as is reasonably practicable.
- To inform employees any Health and Safety information relevant to their place of work.
- To check each company vehicle and where appropriate each site has first aid facilities.
- To train and supervise employees on safe systems of work
- To investigate accidents and dangerous occurrences and report findings and recommendations to their manager.
- The completion of the company accident report form and pass to company Safety Officer for any further action as necessary.

They shall carry out safety inspections at the office/works and on site.

Each Supervisor is responsible for their departments and personnel's Health and Safety as detailed in the current organisation structure. Each supervisor is responsible to ensure the works are carried out in compliance with the CDM Regulations 1994. Each Supervisor is trained as an appointed person first aider (First Aid) requirements 1981.

A training record is kept for each Supervisor to monitor their competence with training given as required.

All Supervisors will be made aware of all emergency procedures and ensure his department is made familiar with them.

The Company Environmental, Health, Safety, Quality Manager is accountable to the Managing Director. Responsible for advising company managers on statutory Health and Safety Legislation, Health and Safety approved codes of practice and guidance and technical standards applicable to the safety performance of the company. Further responsibilities include:-

- Taking follow-up action on receiving notification of any accident or dangerous occurrence.
- Completion of statutory accident reporting requirements to the proper authorities following an accident or dangerous occurrence.
- Statutory notification to authorities for work meeting CDM requirements.
- Liaison with external bodies such as the Health and Safety Executive, Environmental Protection Act, in particular the Duty of Care, and Special waste Regulations.
- Secretary of the company Safety Committee

APEX LIFTS

- Organising Health and Safety training and induction programmes for new starters and the ongoing updating of safety information to all employees.
- To inform review and update employees on emergency and first aid procedures.
- To carry out safety inspections at sites and the review of site welfare facilities.

The Company Environmental, Health, Safety, Quality Manager shall monitor all safety inspections on sites and the office/works.

The Company Environmental, Health, Safety, Quality Manager is responsible for all departments and personnel's Health and Safety as detailed in the current organisation structure. The Safety Officer will consult with the Health and Safety Advisor when reviewing the policy. The Company Environmental, Health, Safety, Quality Manager is to monitor the company's performance under the CDM Regulations 1994.

The Company Environmental, Health, Safety, Quality Manager is trained for First Aid at work appointed person HS (First Aid) Requirements 1981.

A training record is kept for the Safety Officer to monitor his/her competence with training given as required.

The Company Environmental, Health, Safety, Quality Manager shall ensure all staff and employees are made aware of all the emergency procedures within the buildings and sites.

All employees have a duty under the Health and Safety at Work Act.

- To take reasonable care for the Health and Safety of himself and of other persons who may be effected by his acts or omissions at work and
- As regard any duty or requirement imposed on his employer or any other persons by or under any relevant statutory provisions, to co-operate with him so far as is necessary to enable that duty or requirement to be performed or complied with.

Each employee is responsible to ensure the works are carried out in compliance with the CDM Regulations 1994.

Apex plans where possible to get each employee is trained in basic first aid and appointed persons where required.

A training record is kept for each employee to monitor their competence with training given as required.

All employees will be made aware of all emergency procedures.

Breach of the company's safety rules will be dealt with using the Company's disciplinary procedure with a reprimand, which may result in dismissal.

July 2004 revision 2

Resolution of Safety Problems

Any employees with a Health and Safety problem must inform their supervisor/manager. If, after investigation, the problem is not corrected in a reasonable time, or the supervisor/manager decides that no action is required and the employee is not satisfied with the explanation, the employee may then refer the matter to their Safety Officer who may make representations to the supervisor/manager concerned. This may be in writing.

Sub-Contractors

Any Sub-Contractor will be required to complete a Health and Safety Questionnaire and submit their Health and Safety Policy and ensure they comply with our Health and Safety Plan ensuring their competence as an approved Sub-Contractor.



APEX LIFT AND ESCALATOR ENGINEERS LTD
COMPANY HEALTH AND SAFETY ARRANGEMENTS

Contact

- | | | |
|---|---|---------------------------------|
| The Company Environmental,
Health, Safety, Quality Manager | - | James Palmer |
| Managing Director | - | Warren Jenchner |
| Company Secretary | - | Mrs E. Jenchner |
| External Advice and Information | - | LEIA, LITS and EFF South |

24 hours per day Health and Safety contact in the event of an accident or dangerous occurrence;

HEAD OFFICE	-	Tel: [REDACTED]
24 hours		Fax: [REDACTED]

Web: www.apexlifts.com

APEX LIFT AND ESCALATOR ENGINEERS LTD**3.0 ARRANGEMENTS**

In carrying out its responsibility to provide and maintain a safe and healthy working environment, the company will, after consultation with Trade Unions, Employers Federations and Lift Association, provide and distribute appropriate codes of practice, guidance notes and bulletins, detailing safe systems of work. The company will also analyse all reports of accidents and take necessary remedial action in order to ensure that future, similar occurrences are avoided.

3.1 PROCEDURES, PRECAUTIONS AND SAFE SYSTEMS OF WORK

The Company, as a member of the Engineering Employee Federation, recognise the booklet issued by the Lift and Escalator Industry Association under the heading of "Lift Safety Site Handbook" In addition, British Standard Code of Practice "Safe Working on Lifts" (BS7255) booklet is available to employees at Head Office. All employees are instructed to read and abide by the details given therein, signing the document as proof of same on commencement of employment.

3.1.1 The Sales Manager and Sales Department will ensure, at the tendering and planning stages of a contract all Health and Safety requirements are acknowledged and allowed for.

3.1.2 The Directors/ Senior Management shall monitor the effectiveness of the policy with reviews annually.

3.2 ACCIDENTS AND OCCURRENCES**3.2.1 Reporting Procedures**

All accidents, at work must be reported to Head Office as soon as is practicable. Details of the accident will be registered in the Accident Book (Form BI-510) in proxy if necessary as follows:-

- a) Name address and occupation of injured person.
- b) Signature of injured person or signature and address of other person making entry.
- c) Date when accident was entered in book.
- d) Date and time of accident.
- e) Location of accident.
- f) Cause and nature of injury.

In accordance with Reporting of Injuries, Disease and Dangerous Occurrences Regulations 1995 (RIDDOR 1995) Fatal accidents, major injuries and dangerous occurrences must be reported by the quickest possible means, normally the telephone, to the Health and Safety Executive Office, followed by Form 2508 within ten days. In other cases, an injury where the injured person is incapacitated from work for a period of more than three days a Form 2508 must be forwarded to the Health and

Safety Executive Office within ten days. However, no immediate telephone call is necessary.

3.2.2 Investigating Procedures

- a) In the case of a notifiable accident or dangerous occurrence the Senior Fitter/Supervisor is to ensure work in the vicinity is suspended, pending investigation.
- b) Inform Head Office of injury detail and action taken. Damage to plant, tooling, materials or structure, and remedial action, if any taken.
- c) In the case of a notifiable accident, the Supervisor/Manager will investigate the cause of accident.
- d) Once the cause of accident is established, the Company is to take the appropriate remedial action to prevent any further reoccurrences and record the hazard and action taken.

3.3 PERSONAL AND PROTECTIVE EQUIPMENT

(PPE) The provision of PPE is as detailed below. Where necessary, overalls are provided at the Company's expense and must be worn to reduce the risk of accidents. Hand protection and safety footwear is also provided by the Company where this has been identified by Risk Assessment.

Head protection to BSEN 397:1995 is supplied to all site personnel to be worn during work at construction sites and work of Engineering Construction, or as detailed by Risk Assessment. Each employee will sign for receipt of headgear and accompanying information leaflet HS IND (G) 80L. It is important for all head protection to fit correctly and comfortably, and that manufacturer's guidance on use is followed.

P.P.E. – Lost, damaged or out of date P.P.E. will be replaced by the company on request.

Where a Risk Assessment has identified that ear and eye protection is required, this will be supplied at the Company's expense. If an employee is working on a site as a sub-contractor, he/she must ensure that he/she abides by those enforcements and recommendations laid down by the Main Contractors Health and Safety Policy, and must make contact with the site foreperson or Safety Officer before commencement of works.

3.4 WELFARE FACILITIES

In recognition of the need for satisfactory employee welfare, the company will institute safe working practices as follows:-

- a) Ensure adequate lighting and ample ventilation.
- b) Provide comfortable heating in indoor workplaces.

The Company will further make sure employees have adequate working space and walkway areas, which are kept clean and free from obstruction. Wholesome drinking water, sufficient washing facilities, first aid facilities and provide sanitary conveniences.

Construction Site – Prior arrangements will be made with the Main Contractor to ensure adequate resources for shelter and storage of working clothes.

Employees must make contact with Site Safety Officer or his representative to ensure full compliance with safety requirements as above mentioned paragraph and including First Aid facilities and fire evacuation procedures. Any difficulties or problems to be reported to the Company Manager in charge of works.

Alcohol and Drugs

Alcohol and drugs shall not be abused before or during the working day.

Smoking

To protect people from tobacco smoke, we operate a NO SMOKING ZONE; any employee who requires to smoke can do so in his rest period in the designated area.

Employees, who are feeling unwell, should inform their immediate superior.

Housekeeping/site tidiness

An area will be designated for the disposal of redundant materials/waste at offices, works and all sites. The cleaning away will be done on a weekly basis within our own vehicles and disposed off in accordance with registration under the control of Pollution Act 1989.

Site Accommodation

A secure area if required will be made available for storing of materials either within the clients building or using a site container. Toilet and washing facilities will be made available in site using facilities with the building or within a steel security container.

Control Road Transport.

The designated driver of each vehicle as current issued listing is responsible to ensure the day to day routine checks are carried out. The transport manager is responsible for the regular maintenance as detailed in the manufacturer's requirements.

3.5 MACHINERY AND SUBSTANCES

3.5.1 Machinery PUWER 1998 – All new or hired plant/equipment will be inspected before use and checks made to ensure all guards are secure and safety features operational as the Provision and Use of Work Equipment Regulations 1998. Instructional training will be given and recommended safety equipment must be available for use by site personnel.

All Company plant/equipment will be tested and certificated for electrical/mechanical integrity in accordance with PUWER 1998 either HSE Planned Maintenance guidance notes or manufacturer's instructions, and a documentary record will be held for each such piece of equipment. Any item of equipment without such a test record shall not be authorised for use.

All lifting equipment will be inspected in compliance with the Lifting Operations and Lifting Equipment Regulations 1998.

All plant/equipment will be maintained at regular intervals as manufacturer's recommendations.

- 3.5.2 Substances – Substances currently in use will have been assessed according to the current COSHH regulations. For all new substances a hazard data sheet will be requested from the supplier. An assessment will be carried out against Guidance Note EH40, and a data sheet issued detailing use and storage considerations.

Managerial and Supervisory staff will receive ongoing assessment training and maintain a library of such assessments.

3.6 SPECIAL RISKS

- 3.6.1 Any works which can be identified as involving a "Special Risk" e.g.

- | | |
|--------------------------------|-------------------------------------|
| a) Working in confined spaces. | i) Hoists |
| b) Asbestos | j) Lifting Equipment and Operations |
| c) Dust | k) Cranes |
| d) Welding | l) Machines |
| e) Abrasive wheels | m) Fork Lift Truck |
| f) Working at Heights | |
| g) Scaffolding | |
| h) Noise | |

Will require compliance with specific legislation as well as any specialist training or equipment this will be assessed prior to commencement of work with a method statement.

If in the event of a special risk arising during work, such work will cease forthwith. Professional advice will be sought prior to commencement or continuation of work, and any specialist equipment obtained and procedures followed.

A case history of each such event shall be compiled by the safety officer and held on record for future reference.

- 3.6.2 Any works by sub-contractors or other trades within/on the premises of Apex Lifts or at various sites and locations as required a permit to work system will be put in place to help monitor works being carried out.
- 3.6.3 All electrical works shall be carried out by persons in possession of correct competence and if required method statements and permit to work system.

3.7 EMERGENCY PROCEDURES

- 3.7.1 All staff/employees will make themselves familiar with the fire evacuation procedures and first aid facilities at all locations where they are working, and will advise the client or owner of their presence.
- 3.7.2 All subcontractors shall be informed and made aware of all emergency procedures before any works commence.

All subcontractors will be required to submit a Health and Safety Plan before they are allowed on site.

- 3.7.3 24 hours notice will be given before deliveries are carried out to give ample time for clear areas to be arranged and access to the occupied buildings.

Danger notices and work notices will be posted to inform of particular works being carried out within occupied buildings. All employees will ensure the work activities that they are carrying out shall cause the minimum inconvenience and nuisance to the occupants, with obtaining any necessary permits from the client or owner of the premises.

- 3.7.4 All staff/employees will ensure that all visitors to the offices, works or various work sites receive adequate Health and Safety training and are escorted by an authorised member of Apex staff at all times, as required.

- 3.7.5 (Fire exit notices are displayed in office and workshop areas.) Fully equipped first aid kits are situated in the meeting room. Workshop areas and within each vehicle.

Smoking prohibition notices must be observed at all times.

In the event of an emergency, the Company and its employees will seek guidance from a senior member of staff in each work area for guidance in such matters e.g. isolation of services, evacuation of personnel, operation of emergency equipment etc.

Whilst in transit on Company Business, an employee will abide by legislation according to the 1988 Road Traffic Act and the guidelines within the Highway Code. In the case of an incident, direction will be sought from members of the appropriate emergency equipment etc.

Whilst in transit on Company Business, an employee will abide by legislation according to the 1988 Road Traffic Act and the guidelines within the Highway Code. In the case of an incident, direction will be sought from members of the appropriate emergency service.

3.8 COMMUNICATION

The company is committed to updating all relevant procedures with current information from the Employers Federation, Lift Associations and the Health and Safety Executive. Such appendices or changes will be communicated to the employees by staff notice board postings, leaflets, practical instruction or any other means the company considers appropriate.

All employees to familiarise themselves with the "Health and Safety Law Poster" and "Treatment of Persons Suffering with Electric Shock" Notice and other notices

distributed around Head Office premises. Refer to enclosed HSE Leaflet 24 and other HSE Leaflets. Know the Company current telephone numbers for assistance or information.

3.9 SAFETY REPRESENTATION & SAFETY COMMITTEE

The company identifies that the Co-operation and collaborative approach to Health and Safety in the workplace is of great benefit. Therefore, the company has a commitment to an ongoing consultation with its employees through safety representation and a safety committee.

Those serving on the committee will be offered training in line with current company practices outlined in the regulations.

The Safety Committee meeting will take place at a frequency to suit the current Agenda items.

The Safety Committee will consist of:-

- a) Appointed Safety Representative.
- b) Chairman appointed by the Managing Director.
- c) Safety Officer (ex officio)
- d) Supervisor / Manager

Safety Representation and Safety Committee other people may be co-opted by mutual Agreement for individual meetings as required. For each Committee meeting the Agenda will include those items which are to be discussed. The only other items which will be included on the Agenda are those which are of general importance within the Company's activities.

The Agenda will be given to each Safety Committee member at least five working days prior to the meeting and posted on the Notice Boards. The minutes will be in the form of short action minutes and will include the date the item was introduced onto the Agenda and the initials of the Safety Representative concerned. The minutes will be circulated to each committee member.

The procedure for dealing with safety problems is dealt with separately and must be followed.

3.10 TRAINING

The company will provide the financial resources to ensure the training of its employees in the furthering of Health and Safety awareness. On recruitment, all new employees will receive the following information and induction training.

- a) A copy of the Company health and Safety Policy together with relevant documents and ensure employee reads and understands same.
- b) Ensure employee know the procedures to follow for first aid treatment.

APEX LIFTS

- c) Explain procedures in the case of an accident and the system of accident reporting. The name of Supervisor/Manager to whom they should report if an accident, health hazard or dangerous occurrence should occur.
- d) Advice on Safety at Work and Company Procedures in relation to potentially hazardous areas and tasks.
- e) Use of plant, machinery and equipment. Safe use and care of personal protective equipment.

Ongoing training will be given to all levels of employees, following for instance new legislation, change of work activities, and exposure to new or increased risks or when the Company believes retraining is required. I.e. the Risk Assessment would identify the need for additional training.

Training: Training and refresher courses will be given in regard to Fork Lift Operators, Abrasive wheels etc.

The Company will permit reasonable time off with pay during working hours for safety representatives and first aiders to undertake basic and subsequent training, which will be given by qualified persons.

3.11 MANAGEMENT OF HEALTH AND SAFETY AT WORK REGULATIONS 1999

The Company aim to recognise all probable hazards, and therefore take preventative and protective measures by:-

Making a suitable and sufficient assessment of the health and safety risks to employees and those not in his employment; in the office or on site, and any significant findings to be recorded.

Employees to be informed of any risks to their health and safety and the controls to be put in place as preventative and protective measures. A review will be carried out to maintain the effectiveness of the measures. Employees must in their own interest report any dangerous situations or Health and Safety Risks.

Sub-Contractors and the Public must be informed of risks, which affect them and report to the Company any dangerous situations or Health and Safety Risks. Contractors must advise the Company of any risk on their behalf, believed to be dangerous or a risk to Health and Safety. Periodical inspections will be carried out to assess the effectiveness of this Policy and ensure compliance by employees. These inspections will be made in conjunction with the Risk Assessments, Accident Records, COSHH and any future requirements of new legislation.

Spot checks will be carried out from time to time. As an ongoing commitment to Health and Safety, information reinforcing previous training and instruction will be circulated to employees and sub-contractors as and when the Company deems it necessary, i.e. if an employee has an accident.

We will continually monitor the Company Health and Safety at Work Policy. An Employee having a request or suggestion in regard to Health and Safety at Work should make it, in writing to a Supervisor/Manager.

July 2004 revision 2

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3.12 COMMON HAZARDS

Reference should be made to the LEIA "Lift Safety Site Handbook" and BS7255 (Safe Working on Lifts), for guidance about common hazards found in the Lift and Escalator Industry. All employees will be issued a copy of the LEIA booklet in accordance with Section 3.1 of this policy. A copy of BS7255 is available at the Company Head Office. In the event of loss of the EEF booklet a replacement copy should be requested from the Company Head Office.

The Company will carry out a suitable and sufficient assessment of all workstations. Any risks identified by the assessment will be reduced to the lowest extent practicable.

Records of each assessment will be recorded unless:-

- a) It is easily and quickly repeatable.
- b) There is no significant risk.

To reduce eye fatigue, muscular strain and stress the Company will require DSE operators to arrange their daily work routine in such a way as to incorporate periodic breaks from the screen or change of activity.

Employees using DSE are entitled, but not obliged, to undergo an eyesight test.

3.13 DISPLAY SCREEN EQUIPMENT (DSE)

As a result of the eye test if the employee requires VDU "corrective glasses" the Company will provide them. Training towards reducing risks associated with DSE usage will be carried out by the company.

3.13 MANUAL HANDLING

In accordance with the Management of Health and Safety at Work Regulations 1999 (MHSW), the Company is required to assess risks arising from work activity. (See Section 3.11 of this policy).

The Company will carry out a thorough assessment in accordance with Manual Handling Operation cannot be avoided, reducing the risk of injury to the lowest reasonable level.

The Company will, whenever practicable, avoid the need for any hazardous manual handling.

3.14 THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 1994.

The Company will ensure that a framework is introduced to cover the design of equipment where applicable, commissioning of work, its planning and implementation, which applies to construction work where significant risks are faced by employees.

APEX LIFTS

The Company has committed to Health and Safety and will apply the regulations where work will:

- Last for more than 30 days, or
- Will involve more than 500 person hours work, or
- Include any demolition work, or
- Involve five or more employees being on site at any one time.

Written notification will be passed to the HSE before any work commences in accordance with the regulations.

The Company will appoint, on request by the Main Contractor, a planning supervisor and/or principle contractor in respect of each contract. It will be ensured that where necessary the posts will be changed or renewed until the end of the contract. The Company will ensure the holder(s) of the appointment are competent.

Where the principle contractor is appointed by the main contractor of the construction phase and is not an employee of the company, the company will ensure full co-operation, including applying any reasonable rules and/or directions. The principle contractor will be notified of any information reportable under RIDDOR Regulations Relating to Accidents and Dangerous Occurrences. The Company will also inform the principle contractor of any other information it thinks should be passed on.

No employee will commence construction work until he has been informed of the names of the planning supervisor, principle contractor and the Health and Safety Plan or relevant parts of it.

**LIFT CONSTRUCTION, MAINTENANCE
AND REPAIR RISK ASSESSMENT****RISKS IDENTIFIED**

<u>RISK REF</u>	<u>ALL LOCATIONS</u>
A1	ELECTRIC SHOCK/BURNS FROM LIFT EQUIPMENT.
A2	ELECTRIC SHOCK/BURNS FROM HAND TOOLS AND EQUIPMENT.
A3	MANUAL HANDLING.
A4	FALLING OBJECTS ONTO FEET.
A5	FALLING OBJECTS ONTO HEAD.
A6	EYE INJURY FROM FLYING OBJECTS, METAL.
A7	SLIPS, TRIPS AND FALLS AT SAME LEVEL.
A8	EXPOSURE TO HAZARDOUS SUBSTANCES.
A9	ACCIDENT OCCURRING WHILST WORKING ALONE.
A10	INCORRECT USE OF TEMPORARY SHORTING LEADS.
A11	INADEQUATE LIGHTING.
A12	EXPOSURE TO ASBESTOS FIBRES.
<u>LIFT LANDING</u>	
AL1	FALL FROM LIFT LANDING INTO WELL/PIT.
AL2	UNAUTHORISED ENTRY INTO LIFT CAR.
AL3	RELEASE OF TRAPPED PASSENGERS.
<u>LIFT PIT</u>	
AP1	CRUSHING/TRAPPING – UNEXPECTED MOVEMENT OF LIFT CAR.
AP2	FALLS FROM LADDERS/INTO PIT.
AP3	WATER IN PIT.
AP4	HAZARDOUS WASTE/SHARPS.
<u>LIFT WELL</u>	
AW1	CRUSHING/TRAPPING – UNEXPECTED MOVEMENT OF LIFT CAR – CONTACT WITH WELL EQUIPMENT.
AW2	OVERTRAVEL/LIMITED HEADROOM.
AW3	FALL FROM LIFT CAR ROOF.
AW4	FALL FROM LANDING (LIFT ENGINEERS).
AW5	FAILURE OF SUSPENSION ROPES/MECHANICAL HANDLING EQUIPMENT WHILST WORKING ON CAR.
AW6	UNGUARDED MACHINERY (DOOR GEAR).
AW7	CONTACT WITH ADJACENT LIFT CAR, COUNTERWEIGHT.
<u>LIFT MACHINE ROOM</u>	
AM1	CONTACT/TRAPPING BY MOVING ROPES.
AM2	FALLS FROM ACCESS LADDERS/STAIRWAYS.
AM3	UNAUTHORISED ENTRY INTO MACHINE ROOM.
AM4	FAILURE OF MECHANICAL HANDLING DEVICES.

RISK ASSESSMENT MATRIX

		SEVERITY			
		1 NEGLECTIBLE	2 MINOR INJURY	3 SERIOUS INJURY	4 MAJOR INJURY
FREQUENCY / PROBABILITY	1 IMPOSSIBLE	1	2	3	4
	2 IMPROBABLE	2	4	6	8
	3 REMOTE	3	6	9	12
	4 OCCASIONAL	4	8	12	16
	5 PROBABLE	5	10	15	20
	6 FREQUENT	6	12	18	24

RISK RATING KEY:

1-4 LOW ACCEPTABLE

5-9 MEDIUM INVESTIGATE AND WHERE PRACTICAL
REDUCE THE RISK

10-14 HIGH ACTION MUST BE TAKEN TO REDUCE THE RISK

15-24 VERY HIGH RISK IS TOO HIGH TO START WORK OR
CONTINUE. WORK MUST STOP

APEX LIFTS

RISK ASSESSMENT

RISK REF A1

LOCATION:	ALL LOCATIONS – ALL LIFTS
ACTIVITY:	ROUTINE MAINTENANCE, REPAIR, FAULT FINDING, TESTING AND RECTIFICATION
HAZARD:	ELECTRIC SHOCK / BURNS – CONSEQUENTIAL INJURIES
PERSONS AT RISK:	LIFT ENGINEERS
FREQUENCY:	PROBABLE
INITIAL RISK RATING:	5 X 4 = VERY HIGH
RISK RATING AFTER CONTROL MEASURES:	2 X 4 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

It is Apex policy that work on electrical systems should be carried out after the power supply has been isolated. In order to prevent inadvertent reconnection the main switch must be "locked off" and "tagged out" clearly indicating that work is being carried out. The Apex Safety Instruction "Lock and Tag Out" Procedure must be followed. All main switches must be clearly identified with the relevant lift number. Where main switches are not capable of being locked off, it is Apex policy to progress their adaptation with the client. In such circumstances, some other method of isolation must be operated, e.g. the withdrawal of fuses, which are kept with the engineer. A warning notice that "work is being undertaken" must be displayed.

Work on live equipment is strictly controlled and is generally limited to faultfinding and testing. Such work must only be carried out by skilled engineers. When working on live systems, precautions (including knowledge of the circuits, suitable tools and test instruments, rubber mats and controllers, etc.) must be taken.

"Live electricity" warning notices should be displayed on electrical equipment but particularly on group controllers which remain live when other parts of the system are isolated.

Wherever possible all live conductors that may be dangerous should be covered by an insulating material, e.g. an insulating curtain so that they are safe.

All doors to control cabinets must be closed and secured when access to it is not required.

As recommended by the Guidance to the Electricity at Work Regulations, a "treatment for electric shock" notice should be displayed in appropriate locations".

APEX LIFTS

RISK ASSESSMENT

RISK REF A2

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: USE OF ELECTRIC HAND TOOLS AND EQUIPMENT

HAZARD: ELECTRIC SHOCK / BURNS – CONSEQUENTIAL INJURIES

PERSONS AT RISK: LIFT ENGINEERS AND OTHERS

FREQUENCY: REMOTE

INITIAL RISK RATING: 3 X 4 = HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Wherever possible battery powered tools and equipment must be issued. If this is not possible then low voltage equipment (i.e. 110V centre tapped) should be used. All portable electrical equipment must be subject to regular inspection and electrically tested. All engineers are required to check that the electrical equipment is within "the next due" of inspection. The use of extension leads is to be avoided but where they are required they should not exceed 25 metre in length (suitably protected against tripping).

All electrical hand tools (other than battery powered equipment) must be used in conjunction with a 6mA Ground Fault Circuit Interrupter.

APEX LIFTS

RISK ASSESSMENT

RISK REF A3

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT MAINTENANCE / REPAIR /
CONSTRUCTION

HAZARD: MANUAL HANDLING

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: FREQUENT

INITIAL RISK RATING: 6 X 3 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 4 X 3 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Whilst every effort is made to reduce hazardous handling, many of the lifting activities undertaken by lift engineers have assessed as high risk. Wherever possible, handling equipment will be provided to remove or reduce the risk of injury. Where this is not possible, instruction and training of the correct methods is given. Where the work is considered as high risk, two or more employees must be involved to reduce the risk.

All employees are instructed to stop work and seek assistance if they consider the manual handling task is hazardous.

APEX LIFTS

RISK ASSESSMENT

RISK REF A4

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: HANDLING HEAVY COMPONENTS / TEST WEIGHTS

HAZARD: FALLING OBJECTS ONTO FEET

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: PROBABLE

INITIAL RISK RATING: 5 X 3 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 4 X 2 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Wherever possible, working methods should avoid the need for the handling of heavy components.

Heavy components should not be placed / stored in a position where they can fall.

Safety footwear (conforming to EN 345) issued by Apex must be worn.

APEX LIFTS

RISK ASSESSMENT

RISK REF A5

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: CONSTRUCTION, REPAIRS, RE-ROPING

HAZARD: FALLING OBJECTS ONTO HEAD

PERSONS AT RISK: LIFT ENGINEERS AND OTHERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 4 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 3 X 3 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Extreme care must be taken to avoid the risk from falling objects. Wherever possible, work must not be carried out where others are working overhead or where the activities may endanger others who are below where work is being carried out. Apex procedures require that where more than two persons are required to work in an individual lift shaft then this activity must be specifically authorised.

The fitting of heavy components above others must be avoided wherever possible. Where scaffolding or similar equipment is erected, boards or netting must be so placed to stop the fall materials, tools etc. This is particularly important where people are likely to work in vulnerable locations, e.g. landing entrances and lift well where material can fall.

Safety helmets must be worn on all construction and modernisation sites.

Whilst working in the lift well and during lifting operations, a safety helmet must be worn by the lift engineers. At other times whenever there is a risk of head injury, a safety helmet will be worn on this contract.

Safety helmets must be replaced on a regular basis and after and substantial impact.

APEX LIFTS

RISK ASSESSMENT

RISK REF A6

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT REPAIR / CONSTRUCTION

HAZARD: EYE INJURY DUE TO FLYING OBJECTS,
MATERIAL

PERSONS AT RISK: LIFT ENGINEERS AND OTHERS

FREQUENCY: PROBABLE

INITIAL RISK RATING: 5 X 3 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 2 = LOW

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

When the substances are being used, material cut, or cement or metal struck, ground or drilled, there is a likelihood of flying fragments material, which could possibly injure the eyes. Apex supplies eye protection that must be worn on all Construction and Modernisation sites. On Service and Repair sites eye protection must be worn when working on landings, in lift shafts, pits, car and in the machine rooms. Safety goggles issued by Apex must be used when drilling, grinding or chipping out.

Care must not be taken to avoid flying objects endangering others, e.g. by the use of screens or working in the area where others are not exposed.

APEX LIFTS

RISK ASSESSMENT

RISK REF A7

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: SLIPS, TRIPS AND FALLS AT TH SAME LEVEL – PROJECTIONS FROM FLOOR

PERSONS AT RISK: LIFT ENGINEERS AND OTHERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 3 = HIGH

RISK RATING AFTER CONTROL MEASURES: 3 X 3 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Work must be undertaken in a methodical manner, maintaining a clean and tidy workplace. This applies not only to the lift engineers but also others whose activities may affect the safety of the Apex employees. In order to achieve a safe site, the client's or other employers attention must be drawn to any situation, which is considered unsafe, and action requested.

Where projections exist on/over floors etc. which cannot be removed / relocated then they should be "highlighted" to make them prominent.

Any spills of liquids must be cleared up immediately or warning notices displayed.

APEX LIFTS

RISK ASSESSMENT

RISK REF A8

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: EXPOSURE TO HAZARDOUS SUBSTANCES

PERSONS AT RISK: LIFT ENGINEERS AND OTHERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 2 = MEDIUM

RISK RATING AFTER CONTROL MEASURES: 3 X 2 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

The main hazardous substances used are lubricants, and occasionally, adhesives and paints. It is anticipated that normally only small amounts of these substances will be used apart from oils. When pouring oil, nitrile gloves must be worn. Contact with the skin should be avoided and work clothes must be allowed to become contaminated with oils. When splashing is likely to occur, goggles must also be worn. After exposure, wash skin thoroughly with soap and water as soon as possible.

All personnel are instructed that where other small quantities of adhesives and paints are being used then the workplace must be well ventilated and personal protective equipment as detailed in the Substance Assessment must be worn. Account must be taken if any fumes or vapours that may affect others e.g. paint fumes.

When cleaning down is required, liquids that are not harmful, flammable or damaging to the environment are used.

Only small amounts of oils must be stored in lift machine rooms as detailed in the Apex Environmental Policy. The oil must be stored in suitable containers to avoid leakage. All waste oils must be disposed of in accordance with environmental legislation again as detailed in the Apex Environmental Policy.

Please make reference to the COSHH Information Sheets.

APEX LIFTS

RISK ASSESSMENT

RISK REF A9

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: ACCIDENT OCCURING WHILST WORKING ALONE

PERSONS AT RISK: LIFT ENGINEERS AND OTHERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 4 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 3 X 4 = HIGH

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Lift engineers are not permitted to undertake high-risk work on their own.

All personnel are instructed:

“If an employee working alone is faced in his / her opinion, with a task which for safety reasons requires a second person in attendance, then he / she is deemed to call a second person and not attempt the work without the presence of a second person or other assistance as required.”

Engineers are required to keep others advised of their location so that their continued well being can be monitored.

APEX LIFTS

RISK ASSESSMENT

RISK REF A10

LOCATION: ALL LOCATIONS -- ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: INCORRECT USE OF TEMPORARY SHORTING LEADS

PERSONS AT RISK: LIFT ENGINEERS / LIFT PASSENGERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 4 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Temporary shorting leads may be used to provide a temporary electrical connection to activate devices or identify defective equipment. Such action may only be undertaken by skilled engineers.

Failure to remove shorting leads before returning the lift to service could cause a serious accident or damage equipment.

Shorting leads must only be used as a last resort and where there is no other way of progressing with the job.

Before shorting out a safety circuit, careful consideration must be given to all those affected and warning notices must be displayed. Ensure that the lift will not run on "inspection speed". The short must only be placed on the necessary portion of a circuit. Only as a last resort must landing locks and the car gate switches be shorted out.

The short must be removed at the earliest possible moment and must be removed if the engineer is leaving the vicinity of the lift for any period of time.

APEX LIFTS

RISK ASSESSMENT

RISK REF A11

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: INADEQUATE LIGHTING

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: PROBABLE

INITIAL RISK RATING: 5 X 3 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 3 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Adequate lighting of the lift installation is essential if safe access / egress and safe working conditions are to be achieved.

Permanent lighting of the machine room and the access there to and on the lift landings should be installed.

Permanent lighting provided with the two-way switching is recommended in the lift wells.

Lift engineers are provided with the electric hand lamps / torches to enhance any low levels, but in certain situations these are not suitable. Clients will be made of any inadequate situations and the Apex policy is to progress the improvement of inadequate lighting levels.

AWAG

APEX LIFTS

RISK ASSESSMENT

RISK REF A12

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: EXPOSURE TO ABESTOS FIBRES

PERSONS AT RISK: LIFT ENGINEERS AND OTHERS

FREQUENCY: REMOTE

INITIAL RISK RATING: 3 X 4 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4 = MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Asbestos can be found in lifts and buildings constructed before the mid 1970's. It was used as a fire proofing agent, noise suppressant and insulator. Asbestos still continued to be used as brake linings and spark shields after this date.

If asbestos is suspected in the work place or is likely to be disturbed (e.g. drilling, in doors, cleaning / cabling) then work must be stopped until the material has been confirmed as asbestos then the client will be contacted in order that the material is removed / controlled.

APEX LIFTS

RISK ASSESSMENT

RISK REF AL1

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: FALL FROM LIFT LANDINGS INTO LIFT HOISTWAY / LIFT PIT

PERSONS AT RISK: CLIENTS EMPLOYEES AND VISITORS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4X 4 = VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 1X 4 = LOW

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

All entrances to lift wells must be protected so there is no risk of falling. Barriers must be erected and all engineers are instructed that they must ensure that their activities do not endanger the safety of others. Landing doors must not remain open unless the lift car is positioned at that level. The landing doors must not remain open with the lift car immediately below the open landing thereby removing the risk of a fall from the landing but only if work is actually being undertaken at that landing. The ground floor landing doors will not remain open without the lift car at that level any longer than necessary and then only to gain access to the lift pit. When they are required to be left open then they will be physically guarded by barriers, which must be affixed into the landing door track to withstand impact or the landing doors closed to a minimal gap.

APEX LIFTS

RISK ASSESSMENT

RISK REF AL2

LOCATION: ALL LOCATIONS – ALL LIFTS

ACTIVITY: DURING LIFT MAINTENANCE / REPAIR

HAZARD: UNAUTHORISED ENRTY INTO LIFT CAR

PERSONS AT RISK: LIFT PASSENGERS

FREQUENCY: REMOTE

INITIAL RISK RATING: 3X 1= LOW

RISK RATING AFTER CONTROL MEASURES: 2X 1= LOW

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

In most situations, access into the lift car during the lift maintenance and repair will not create a hazardous situation to the intended passenger. However, inconvenience and / or distress may be caused. Warning notices must therefore be displayed.

By use of the roof top controls, the lift landing and car door must remain closed whilst the work is being conducted with these doors isolated from the landing push buttons. If this is not possible, physical barriers must be erected to stop intending passengers accessing the lift car. Should it be necessary for the doors to open without barriers being in place, then checks must be made to ensure that passengers have not entered the lift car.

APEX LIFTS

RISK ASSESSMENT

RISK REF AL3

LOCATION: LIFT LANDINGS / LIFTWELL – ALL LIFTS

ACTIVITY: RELEASE OF TRAPPED PASSENGERS

HAZARD: FALL / INJURY DURING RELEASE OF TRAPPED PASSENGERS

PERSONS AT RISK: LIFT PASSENGERS / AUTHORISED PERSONNEL (AND LIFT ENGINEERS)

FREQUENCY: REMOTE

INITIAL RISK RATING: 3X 3= MEDIUM

RISK RATING AFTER CONTROL MEASURES: 2X 3= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Only trained and authorised persons must undertake the release of passengers trapped in a lift car. Alarms / telephones should be fitted in the lift car as required by EN81 / BS 5655. All passengers should remain in the lift car until they are released. Communication must be established by those undertaking the release as soon as possible. The instruction and precautions detailed during Passenger Release Training must be strictly to communicate the movement and position of the car.

Before attempting to move the car, it is imperative that all involved are warned of the intention and the passengers must also be warned not to attempt to leave the lift car until advised to do so. If any doubt exists then the release of passengers must be halted until the arrival of trained lift engineers.

All persons undertaking release of trapped passengers must have undergone the Apex Passenger Release Training programme. See 7255 (EOR 202).

APEX LIFTS

RISK ASSESSMENT

RISK REF AM1

LOCATION: MACHINE ROOMS – ALL LIFTS

ACTIVITY: WORKING ON OR NEAR TRACTION MACHINES

HAZARD: CONTACT / TRAPPING BY MOVING ROPES

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 3= HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 3= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Rope sheaves should be physically guarded to avoid risk of entrapment between sheave and ropes and also the brake mechanism. Likewise, ropes passing through machine and pulley rooms should be guarded.

Special care must be taken when guards are removed.

No direct cleaning, rope testing or sheave cleaning operation must be undertaken from the machine room without isolating the machine and locking off the supply using the procedure. After performing such tasks the surrounding area must be cleared of all tools, rags, materials etc. before switching the power back onto the lift whether for further testing or for returning the lift service.

Protective gloves must be worn when examining ropes.

A remote isolation switch should be fitted to act as an emergency stop whilst working on an unguarded sheave.

APEX LIFTS

RISK ASSESSMENT

RISK REF AM2

LOCATION: MACHINE ROOMS – ALL LIFTS
ACTIVITY: ACCESSING LIFT MACHINE ROOMS
HAZARD: FALLS FROM ACCESS LADDERS /STAIRWAYS
PERSONS AT RISK: LIFT ENGINEERS
FREQUENCY: FREQUENT
INITIAL RISK RATING: 6X 3= HIGH

RISK RATING AFTER CONTROL MEASURES: 3 X 3= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

All access ladders and stairways should be fixed but should always be checked for security and safe construction before use. Three points of contact with the ladder must be maintained at all times. Both hands should be used whilst climbing / descending stairs and ladders. Access to many machine rooms can frequently only be accessed by vertical ladders. Grab rails should be suitably placed. Whenever practical, it is recommended that access to machine rooms should be gained via stairways rather than vertical ladders. If the ladders are used, then trap doors must be closed immediately after use, to barriers / chains fitted to avoid falls.

Closed trap doors must not be stepped upon, unless they are known to be adequate strength. Ideally trap doors should be counter-balanced to reduce the physical effort to open them.

All ladders / stairways must be kept clean and well lit. To avoid slipping, footwear must be checked to ensure that it is clean and dry.

APEX LIFTS

RISK ASSESSMENT

RISK REF AM3

LOCATION: MACHINE ROOMS – ALL LIFTS

ACTIVITY: DURING LIFT MAINTENANCE / REPAIR / CONSTRUCTION

HAZARD: UNAUTHORISED ENTRY INTO MACHINE ROOM

PERSONS AT RISK: OTHERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 3= HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 3= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

All lift room doors must be clearly marked as "Lift Machine- Danger Access forbidden to all unauthorised persons" (and accompanied by a pictogram).

The doors to all lift machine rooms must be locked at all times except when access / egress is required. When the machine room is not occupied the door must be locked.

APEX LIFTS

RISK ASSESSMENT

RISK REF AM4

LOCATION: MACHINE ROOMS – ALL LIFTS

ACTIVITY: DURING LIFT MAINTENANCE / REPAIR / CONSTRUCTION

HAZARD: FAILURE OF MECHANICAL DEVICES

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 4= HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Certain operations may require heavy components to be lifted, suspended or lowered. Mechanical handling equipment, e.g. winches, tackles, must be used to carry out these operations. The Company operates procedures for the regular examination of all lifting equipment. All overhead beams intended for use during lifting operations must be tested and clearly marked.

Mechanical handling must only be undertaken by those employees who are competent with the equipment being used. All equipment must be visually inspected before use.

The Safe Working Loads displayed on lifting equipment must not be exceeded. Where persons are required to work on the suspended load, e.g. a lift car, then the SWL's must be reduced by 50% to ensure that there is a safety margin to reduce the likelihood of a failure of the lifting equipment. Slings should be closely examined for damage each time they are used and packaging must be used and account should be taken of this when establishing the safe working loads.

All overhead beams used during lift operations must be tested and clearly marked with the SWL. Current examination certificates must be available.

APEX LIFTS

RISK ASSESSMENT

RISK REF AP1

LOCATION: LIFT PITS – ALL LIFTS

ACTIVITY: WORK / ACCESS IN THE LIFT PIT

HAZARD: CRUSHING / TRAPPING UNEXPECTED MOVEMENT OF LIFTCAR

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: REMOTE

INITIAL RISK RATING: 3X 4= HIGH

RISK RATING AFTER CONTROL MEASURES: 2X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

A stop switch must be fitted in each lift pit, so that it can be operated from the lowest floor landing before access to the lift pit is gained. These switches should be located 1.3 metres above the lowest landing threshold and no more than 1 metre from the landing entrance opening. The stop device must be operated before entry is made into the lift pit. A check must be made to ensure that the lift pit switch is working correctly. This check should include the closing of the landing doors after the activation of the stop switch and attempting to call the lift from the landing allowing for any duplex or triplex, etc. arrangements.

On hydraulic lifts, a purpose-made prop, stored in the pit, must be placed under the car before work is undertaken in the lift pit.

APEX LIFTS

RISK ASSESSMENT

RISK REF AP2

LOCATION: LIFT PITS – ALL LIFTS
ACTIVITY: LIFT MAINTENANCE / REPAIR
HAZARD: FALLS FROM LADDERS / INTO PIT
PERSONS AT RISK: LIFT ENGINEERS
FREQUENCY: PROBABLE
INITIAL RISK RATING: 5 X 3 VERY HIGH
RISK RATING AFTER CONTROL MEASURES: 3 X 3= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Wherever possible both hands should be used whilst climbing / descending ladders.

It is recommended that materials and tools are raised and lowered using rope than attempting to climb ladders with these items in their hands. To avoid slipping, footwear must be checked to ensure that it is clean and dry. Particular care must be taken where soles of footwear can be contaminated with oil. Action should be taken to absorb any oil, etc. in the pit by use of granules, etc.

All pits over 915 mm should be provided with an access ladder. Before use, all ladders must be checked for construction and security. Action should be taken to avoid ladders slipping. Where fitted access ladders are not installed, then portable ladders must be available.

APEX LIFTS

RISK ASSESSMENT

RISK REF AP3

LOCATION: LIFT PITS – ALL LIFTS
ACTIVITY: LIFT MAINTENANCE / REPAIR
HAZARD: WATER IN PIT
PERSONS AT RISK: LIFT ENGINEERS
FREQUENCY: REMOTE
INITIAL RISK RATING: 3 X 3 MEDIUM

RISK RATING AFTER CONTROL MEASURES: 2 X 3= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Due to the construction of some of the lift pits, water may enter the pit. This may cover the pit floor to a minimal depth to occasionally to a substantial depth. All engineers are instructed not to enter any pit until the actual depth has been determined and any variations in the floor level (e.g. sumps) identified. The pit should be pumped out before entering.

Due to the wet conditions, all electrical equipment must be isolated before work is undertaken on it.

APEX LIFTS

RISK ASSESSMENT

RISK REF AP4

LOCATION: LIFT WELL – ALL LIFTS

ACTIVITY: LIFT MAINTENANCE / REPAIR / CONSTRUCTION

HAZARD: HAZARDOUS WASTE, DISCARDED SHARPS /
HYPODERMIC NEEDLES

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: REMOTE

INITIAL RISK RATING: 3 X 4= HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Hazardous waste / discarded hypodermic needles are occasionally found in lift installations, particularly in door tracks and lift pits. These present the risk of injury and possible serious infection. Lift engineers must be aware of this hazard and instructed to wear suitable gloves to protect the fingers and palms and not kneel when working in these areas until they have been completely cleared.

Should any engineer receive an injury from hazardous waste / hypodermic needles then they must seek immediate medical advice.

All field engineers are advised to be vaccinated against Hepatitis B and Tetanus.

Instructions have been issued to all engineers regarding the correct disposal of hypodermic needles.

APEX LIFTS

RISK ASSESSMENT

RISK REF AW1

LOCATION: LIFT WELL – ALL LIFTS

ACTIVITY: ACCESSING / WORKING ON LIFT CAR ROOF

HAZARD: CRUSHING / TRAPPING UNEXPECTED MOVEMENT OF LIFTCAR CONTACT WITH WELL EQUIPMENT

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 4= VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Due to the hazards created by the moving lift car it is essential that personnel working on top of the lift car have total control of the movement of the car. All car tops should be fitted with car top controls which comply with BS7255 / EN81, i.e. provision of up / down / run buttons. Before working on a lift car top, the lift controller, where fitted, must be switched to "Maintenance" and the car top controls must be set to "stop" and "maintenance / inspect" before accessing the car roof. The correct use of these located within one metre of the landing access point.

The correct functioning of the stop / car top controls must be checked in accordance with the Apex Safety Instruction "Safe Access – Top of Car", which must be followed. All travel on the top of car must be conducted on "Inspection Speed".

Where the Stop / Car Top Control does not comply with the above, including where toggle switches are fitted, then other procedures must be followed to ensure safe access and use of the car top as a place of work, e.g. isolation of power at the Main switch using the Apex procedure.

It is Apex policy to progress and non-complaint stop switches and roof top controls with the client.

Engineers must check that car top is clean and free from oil, grease and local objects and maintain a firm hand hold and keep parts of the body within the limits of the car top. Travel in the up direction should not be undertaken unless it is essential to do so.

APEX LIFTS

RISK ASSESSMENT

RISK REF AW2

LOCATION: LIFT WELL – ALL LIFTS

ACTIVITY: DURING MAINTENANCE / REPAIR AND CONSTRUCTION

HAZARD: OVERALL / LIMITED HEADROOM BETWEEN TOP OF CAR AND TOP OF WELL

PERSONS AT RISK: LIFT ENGINEERS ON TOP OF LIFT CAR

FREQUENCY: REMOTE

INITIAL RISK RATING: 3 X 4= HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

There must be enough headroom above the lift cars to provide a space sufficient to accommodate persons travelling on the lift.

Limit switches must be located within the shaft to stop the movement of the lift car past a defined point to create this safe space.

When travel is required on top of the lift car, the lift car top control should be tested by first driving the car down and activating the "stop" button to check it is functioning correctly in accordance with the Apex procedure (See Risk Ref. AW1). Travel in the up direction should not be undertaken unless it is essential to do so. All travel on the top of car must be conducted on "Inspection Speed".

Where limited headroom exists, a safety sign should be displayed in a prominent position preferably close to the car top control station.

APEX LIFTS

RISK ASSESSMENT

RISK REF AW3

LOCATION: LIFT WELL – ALL LIFTS

ACTIVITY: WORKING ON LIFT CAR ROOF

HAZARD: FALL FROM LIFT CAR ROOF

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: PROBABLE

INITIAL RISK RATING: 3 X 4= VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

The voids surrounding lift cars create the potential for falls from the top of the lift car. Any gap greater than 300 mm where a fall two metres or more is likely is considered hazardous and requires action to be taken.

The preferred choice of protection against falls is handrails, barriers, screening and roof top extensions rather than the provision of eyebolts for anchoring the lanyards for safety harnesses. The use of safety harnesses on lifts creates their own hazards, and thus elimination of the risk of falling by physical protection (as detailed above) is the preferred action.

In the absence of such protection, engineers are instructed to wear a safety harness with the lanyard attached to a suitable anchorage whenever they are working within one metre of a hazardous void.

APEX LIFTS

RISK ASSESSMENT

RISK REF AW4

LOCATION: LIFT WELL – ALL LIFTS
ACTIVITY: ACCESSING LIFT CAR TOP
HAZARD: FALL FROM LANDING / UNEXPECTED MOVEMENT OF LIFT CAR
PERSONS AT RISK: LIFT ENGINEERS
FREQUENCY: PROBABLE
INITIAL RISK RATING: 5 X 4= VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

It is essential that all engineers accessing the top of lift cars are instructed, and that a safe system of working practice is followed. Ensure that warning notices "Lift Out of Service" are displayed on all landings. Switch on shaft lights. Call the lift to the top terminal floor. Establish that the car is free of passengers before switching off the electrical supply or gaining access to the lift travel when it is operating at high speed. Lock the machine room doors. Position the car so that access to the car top can be gained safely by use of the emergency release key. Engineers must not attempt to squeeze through restricted spaces. Engineers must not rely on keeping the car or landing doors open as a means of preventing the car movement. Immediately activate the stop switch, which should be fitted within one metre of the landing. Risk Ref. AW1 also details controls.

APEX LIFTS

RISK ASSESSMENT

RISK REF AW5

LOCATION: LIFT WELL – ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: FAILURE OF SUSPENSION ROPES / MECHANICAL HANDLING EQUIPMENT WHILST WORKING ON CAR

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: REMOTE

INITIAL RISK RATING: 3 X 4= HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 4= MEDIUM

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

Whenever the lift car is being used or is being used as a working platform the lift safety gear must be fully functional. This includes periods when the lift car has been lifting equipment and the suspension ropes. (See Risk Ref. AM4)

APEX LIFTS

RISK ASSESSMENT

RISK REF AW6

LOCATION: LIFT WELL - ALL LIFTS

ACTIVITY: DURING LIFT CONSTRUCTION, MAINTENANCE, REPAIR

HAZARD: UNGUARDED MACHINERY OTHER THAN ROPE SHEAVES

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 3= HIGH

RISK RATING AFTER CONTROL MEASURES: 2 X 3= MEDIUM

SAFE SYSTEMS OF WORK - CONTROL MEASURES:

Wherever practical, moving machinery must be guarded, e.g. ropes on traction sheaves, governors, in the lift machine rooms, etc. However, when equipment is not guarded, all engineers are trained to be aware of the movement and the hazards of this equipment but it is Apex policy, where it is practical, to progress the guarding of all hazardous machinery.

Engineers are particularly aware of the operation of the door gears and are instructed that they are isolated whenever they are working close to them (See Risk Ref. AM9).

When working near unguarded machinery the machine should be isolated using the procedure.

APEX LIFTS

RISK ASSESSMENT

RISK REF AW7

LOCATION: LIFT WELL / PIT – ALL LIFTS

ACTIVITY: WORKING ON LIFT CAR

HAZARD: CONTACT WITH ADJACENT LIFT CAR,
COUNTERWIGHT

PERSONS AT RISK: LIFT ENGINEERS

FREQUENCY: OCCASIONAL

INITIAL RISK RATING: 4 X 4= VERY HIGH

RISK RATING AFTER CONTROL MEASURES: 1 X 4= LOW

SAFE SYSTEMS OF WORK – CONTROL MEASURES:

To avoid contact with adjacent lift cars and counterweights, full-length screening should be fitted between lift shafts. In such circumstances, lift pit screens between the lift shafts must be fitted.

Where lifts occupy individual wells, there is no danger of contact with other lift cars. Where counterweights descent into the lift pit, guards should be fitted to protect against contact with the counterweight whilst working in the pit.

Engineers are instructed not to move from one lift shaft to another, unless both lifts are isolated. It is Apex policy to recommend the installation of full-length screening in adjoining lift shafts. Where screening is not fitted and work is being undertaken that creates a risk to adjoining lifts, then it is Apex policy to require the isolation of the adjoining lift.



**METHOD STATEMENT
GRENFELL TOWER
PROVISIONAL GUIDE REPLACEMENT**

1. Ensure that you use the appropriate personal protection equipment.
2. Remember to work safely.
3. Report to customer.
4. Comply with any special customer requirements.
5. Remove all trunking, doors, wiring, limits etc.
6. Strip out car, half weights to counterweight.
7. Scaffold top of shaft.
8. Fit wire guides to weight.
9. Proceed down shaft on normal machine but using tirak or similar hoist. Remove car and counterweight guides, to pit marked up, in order.
10. When in pit stump car, tackle weight to top of shaft.
11. Remove ropes, fit safety sling to counterweight and fit to shaft wall for safety.
12. Remove car and sling.
13. Remove machine and raft from motor room.
14. Diamond drill slab holes x 4, car and counterweight guides, pick up position.
15. Fit new machine, raft.
16. Layout shaft bottom section car guides and counterweight.
Fit bottom section of guides.
17. Fit over speed governor and tension weight.

**METHOD STATEMENT
GRENFELL TOWER
PROVISIONAL GUIDE REPLACEMENT**

18. Using tirak pull up guides, fix through slab on eye and plate.
19. Fit new car sling.
20. Rope sling to counterweight.
21. Go up shaft fitting brackets and guides to position plumb and bone.
22. Halfway point put counterweight into guides and remove eye clamps.
23. Continue up shaft plumbing and boning until complete.
24. Remove shaft scaffold at top of shaft.
25. Re-check all guide plumbings and adjust if necessary.

**GUIDE REPOSITIONING
METHOD STATEMENT
GRENFELL TOWER**

1. Sign in and report to customer, if required.
2. All engineers to use the appropriate personal protection equipment.
3. Work safely to Apex Health & Safety Policy.
4. Comply with any special customer requirements and The Royal Borough of Kensington & Chelsea Health & Safety Policy.
5. Remove all shaft trunking, doors, wiring, limits etc.
6. Modify the car to half height and remove half of the filler weights from the counterweight.
7. Scaffold the top of the shaft, from top of the lift car, see builders work method statement and Corbett Scaffolders method statement.
8. Drill and fit rope guide to the counterweight, drill and fit rope guide bracket at the top of the shaft and pit floor, tension rope.
9. Mark out machine room slab and diamond drill 4 ø 150 holes for hoisting the guides up the lift shaft.
10. Fit lifting beam in machine room test and mark.
11. Fit hoist to beam.
12. Proceed down the lift shaft from the top and utilising the hoist, mark and lower to pit floor counterweight guides, ensuring that counterweight runs through the rope guides.
13. Proceed back to the top of the shaft and repeat 12 coming down the shaft and lowering car guides and removing combination brackets.
14. When the lift is in the pit, tackle the counterweight at top of the shaft. Put safety sling around counterweight.
15. Remove lift car and sling.
16. Remove bottom section of guides and site and edge of pit.
17. Remove oil buffers and sole plate.

**GUIDE REPOSITIONING
METHOD STATEMENT
GRENFELL TOWER**

18. Drop plumb lines and set out new sole plate.
19. Set new position of car and counterweight guide brackets for the first section of guides.
20. Position first of guides and plumb and bone in position.
21. Build new car sling in pit and fit temporary car base with barrier and false working platform.
22. Fit new overspeed governor in machine room and rope to new sling.
23. Using the hoist clamp attached to the top section of guide pull each section up in turn, attaching next section of guide to fishplate ensuring all bolts are used and are secure.
24. Continue this process until the clamp attachment protrudes through the machine room slab, fit floor clamp and remove clamp attachment.
25. Repeat this process for other car guide.
26. This process now leaves both sets of car guides suspended.
27. Proceed up the lift shaft and fix new guide brackets in position to suit the next run of guides, fix guides and plumb and bone to final position. This is to be repeated at every bracket and for each guide until reaching top of shaft.
28. Using same method, pull up counterweight guides to each fixing bracket until reaching halfway point then fit counterweight shoes and put counterweight in guides, removing rope guides.
29. Continue up shaft until all counterweight guides are complete.
30. Check all guides for plumb and boning.
31. Remove temporary rope guides.

**PRELIMINARY GUIDE REPOSITIONING
AS UNDERTAKEN ON PREVIOUS CONTRACTS****METHOD STATEMENT
GRENFELL TOWER**

1. Sign in and report to customer, if required.
2. All engineers to use the appropriate personal protection equipment.
3. Work safely to Apex Health & Safety Policy.
4. Comply with any special customer requirements and Royal Borough of Kensington & Chelsea Health & Safety Policy.
5. Remove all shaft trunking, doors, wiring, limits etc.
6. Modify car to half height and remove half of fillerweight from counterweight.
7. Scaffold top of shaft. - Further method statement to follow.
8. Fit rope guides to counterweight.
9. Proceed down shaft on existing machine but using Tirak method of hoisting, remove car and counterweight guides, these to be marked up in pit for re-installation.
10. When in bottom of shaft stump car and tackle weight to the top of the shaft and fit safety sling.
11. Remove lift ropes.
12. Remove existing car and sling from lift shaft.
13. Remove existing machine and raft from motor room.
14. Diamond drill slab holes x 4, these holes are for the repositioning of car and counterweight guides.
15. Fit new machine raft complete with isolation and fit new machine..
16. Layout shaft bottom section of car guides and counterweight guides.
17. Fit and plumb bottom section of car and counterweight guides.

**PRELIMINARY GUIDE REPOSITIONING
AS UNDERTAKEN ON PREVIOUS CONTRACTS**

**METHOD STATEMENT
GRENFELL TOWER**

18. Fit over speed governor and tension weight.
19. Using Tirak pull up guides, fix through slab on eye and plate fixings.
20. Fit new car sling and platform, complete with safety barrier rails.
21. Re-rope new car sling to counterweight?
22. Proceed up shaft fitting brackets and guides to correct position, plumbing and boning as proceeding.
23. Halfway point put counterweight into guides and remove eye clamps.
24. Continue up shaft plumbing and boning guides and fixings to brackets until complete.
25. Remove shaft scaffold at top of shaft.
26. Re-check all guide plumbings and adjust if necessary.

Previous experience of the method statement: -
London Regional Transport Head Office
55 The Broadway
London
SW1
Four car group.

Modernisation Manager at Apex Lifts – Gary Poynter

Method Statement

1. Upon arrival on site, inform the site caretaker and project personnel of your presence and the area of the lift installation in which you will be working.
2. Read the Risk Assessments for the safe working practice for:-
 - a) LIFT PIT
 - b) LIFT CAR & SHAFT
 - c) ENTRANCES
 - d) MACHINE ROOM
 - e) SUSPENDED WORK PLATFORMS
 - f) HEALTH & SAFETY PLAN (H & S SECTION 6)
3. Ensure that the work you are carrying out will not affect the Safety of your colleagues, moreover, at all times keep each other informed of where you are working.
4. Report any problems with regards to means of access, or any other Dangerous conditions, ensuring you take all reasonable steps to ensure the Safety of yourself and others.
5. Ensure that appropriate safety signs are prominently displayed throughout the installation.
 - a) LIFT ISOLATED DO NOT SWITCH ON
 - b) DANGER OF FALLING FIXED TO BARRIERS AND HOARDINGS.
6. Ensure adequate lighting within the lift shaft and machine room is available to ensure a safe working environment.
7. Before entering the shaft a safe means of egress must be clearly established and readily available.
8. Install temporary lighting & power leads 110 volt ONLY
9. Working at the lowest floor remove the lift car enclosure
10. Connect pendant control
11. Check harness anchorage points in shaft and car sling for security of fixing

APEX LIFTS

12. Starting at the top of the shaft remove the redundant shaft equipment
13. For the cut out of landing entrance headers, seal the landing hoardings using flame retardant sheeting secured with wide tape to effect a complete seal of all hoardings, except the ground floor, remove welds with grinder, drill and fix new headers.
14. Access to and egress from the lift shaft must be at the ground floor only. (Except in an emergency) Seal the lift shaft upon entry with a heavy dust sheet draped across the entrance
15. When cutting out the ground floor entrance the hoarding must be completely sealed.
16. For the landing push box cut-outs, the drills/tools must be fitted with effective dust extractor elements.
17. Ensure the vacuum cleaner & dust extractor elements are cleaned on a regular basis to ensure they are effective at all times
18. Arrange the 110 volt extension leads from the machine room for the 110 volt vacuum cleaners
19. Ensure mops and buckets of clean water are available at the floor to be worked on
20. CONTACT THE PROJECT PERSONNEL BEFORE ANY CUTTING AWAY WORKS ARE CARRIED OUT
21. Carry out the cutting out works in short bursts then clean the surrounding areas
22. ENSURE YOU DO NOT LET A BUILD UP OF DUST OR DEBRIS OCCUR remove and place in skip whilst proceeding
23. After completing the cutting away works on each floor and before you move to another floor carry out a thorough cleaning of the area and corridor
24. Carry out regular checks on the surrounding area to ensure that NO DUST OR DEBRIS ARE ESCAPING into the corridor IF IT IS FOUND THAT DUST IS ESCAPING STOP THE CUTTING AWAY WORKS IMMEDIATELY AND CONTACT THE OFFICE FOR ADVICE No further cutting away works can be carried out until a satisfactory method can be found to prevent the dust problem
25. Install landing entrance frames

APEX LIFTS

26. Remove redundant gear unit, controller & overspeed governor from the machine room
27. Install new gearraft and machine
28. Install new controller and overspeed governor
29. Trunk, tube & wire the machine room
30. Paint machine room equipment
31. Start up & run the lift machine
32. Install landing architrave's
33. Backfill landing architrave's
34. Install landing doors
35. Fit all door accessories & set-up
36. Arrange a level platform/fixing to enable building of car sling at the ground floor area
37. Ensure all equipment is delivered in as small and light sections as possible for ease of installation
38. Install lift car sling & base using tackle's and slings where required
39. Ensure safety harness is worn when working at height on the top of the car sling
40. Install counterweight frame and a number of filler weights to balance the car sling with two persons and hand tools/equipment
41. Read again the safe working practice for working on suspended work platforms
42. Install governor tension weight in pit
43. Install buffers in pit
44. Install pit ladder
45. Raise car platform to the correct position at the top of the shaft for roping
46. Fit hoisting ropes & governor rope
47. Reconnect the pendant control

APEX LIFTS

48. Check the safety gear is operational
49. Trunk, tube & wire lift shaft
50. Hang shaft position tape & magnets
51. Fit fascia's & guarding
52. Hang trailers
53. Install lift car enclosure
54. Fit car door operator & doors
55. Trunk, tube & wire car
56. Connect trailers
57. Carry out painting in shaft
58. Fit all landing pushes & indicators
59. Set up & adjust all equipment
60. Carry out full test as EN 81 note this is a modernisation lift (use part 10 test doc)
61. Attend to all snagging items picked up by the tester ready for witness test and handover
62. Witness test and de-snag
63. Remove hoardings & barriers
64. ENSURE ALL WORKS ARE CARRIED OUT AS THE SAFE WORKING PRACTICES
65. Hand over lift and place in service
66. At the end of each working day, the site foreman, along with the site engineer carry out the SITE SAFETY INSPECTION and complete the report
 - a) Walk the site carrying out an inspection of the site conditions (complete the site conditions section of the site safety inspection report)
 - b) Check that the lift has been isolated (tick or make comment in the isolation section) if not has not been isolated then carry out the isolation of the lift
 - c) Check the security of the machine room (tick or make comment in the machine room section)if not make secure

APEX LIFTS

- d) Check the machine room and shaft lights have been turned off (tick or make comment in the lighting section) if not turn off
 - e) Carry out checks at each landing to ensure all equipment and redundant material have been removed (tick or make comment in the landing equipment/redundant material section)if not removed the items
 - f) Carry out checks at each landing to ensure that the condition and appearance is satisfactory/acceptable i.e. DUST/DEBRIS or REDUNDANT MATERIAL (tick or make comment in the landing condition/appearance section)if not carry out works to correct the condition
 - g) Check at each floor that the landing doors if installed at the time are closed/locked and secure (tick or make comment in the landing doors section)if not make secure
 - h) Check the landing hoarding condition and ensure they are secure/locked and bolted at each floor (tick or make comment in the landing hoarding section) if not lock and secure
 - i) Check the security of the site container and that no equipment or redundant material is left out (tick or make comment in the site container section)
 - j) Complete the site information section, site name & engineers name
 - k) Sign and date the SITE SAFETY INSPECTION REPORT
 - l) Report any problems and comments that can not be resolved to Apex Lifts office and Project Personnel
 - m) Carry out works to the affected area that has been highlighted
 - n) File the SITE SAFETY INSPECTION REPORT in site named section of the Apex Lifts Site Safety Inspection Report File
 - o) The supervisor will inspect these reports on a regular basis and carry out any actions that is required then sign the supervisors section
67. On departure inform the site caretaker & project personnel that you are leaving site
68. Inform your supervisor of your departure from site.

Method Statement
Test and Mark 'SWL' on Motor Room Lifting Beam

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer and comply with any special requirements.
4. Display "Out of Service" Notices at all landings.
5. Gain exclusive control of the lift movement.
6. Ensure the lift is isolated effectively and locked off.
7. Using meter, ensure all supplies are at Zero Volts.
8. The vendor will carry out the testing as per main method statement.
9. On satisfactory completion, record details on the log card and provide Certification for lift owner.
10. Reinstate the lift supply and check operation of the lift.
11. Monitor the operation before returning the lift to passenger service.
12. Remove the "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12

AM1 AM2 AM3 AM4

APEX LIFTS

Method Statement **Introduce new landing indicators**

1. Ensure that you use the appropriate personal protection equipment.
2. Remember to work safely.
3. Report to customer.
4. Comply with any special customer requirements.
5. Display "out of service" signs at all floors.
6. Gain exclusive control of the lift movement.
7. Run all necessary wiring down the lift shaft from motor room to all floor pushes. Barriers to be placed in front of any open entrance.
8. Using a meter, ensure all supplies are at zero volts.
9. Connect indicator wiring to unit mounted in landing push plate.
10. Run wiring into the controller and connect.
11. Reinstate power supply and check operation of unit.

A1 A2 A3 A4 A6 A7 A9

AL1

AW3 AW4 AW7

AM3

Method Statement
Introduce Motor Room Non- Maintained Emergency Light

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Isolate the supply and lock out.
8. Arrange for temporary lighting in the working area from an external power source.
9. Make sure that the motor room supply (which will be separate from the main lift supply) is isolated and locked off.
10. Using a meter, ensure all supplies are at zero volts.
11. Establish a suitable power supply source for the new equipment.
12. Mark out suitable position for Emergency Light Fittings, test switch and routing of conduit run.
13. During any drilling operation take care to ensure that any existing cables are not damaged.
14. Install Emergency Lighting Fittings, test switch, conduit and connect wiring to previously established connection point.
15. Reinstate the lift and motor room supply.
16. Test operation of new motor room emergency lights.
17. Remove the "Out of Service" notices.

A1 A2 A3 A4 A5 A6 A7 A9 A11 AM2 AM3

Issue No. 1

Method Statement
Introduce Buffer Checks Switches

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Gain exclusive control of the lift movement.
8. Fit landing Safety Barrier at bottom entrance.
9. Position the lift to allow safe access and egress to the pit area.
10. When in position ensure the lift is isolated effectively and locked off.
11. Using a meter, ensure all supplies are at zero volts.
12. If there is no permanent pit ladder, ensure you use a portable ladder for safe means of access and egress.
13. Fix actuation ramp to car buffer(s) and ensure switch roller maintains good contact over full buffer stroke.
14. Adjust switch roller to ensure switch contacts open at the point the buffer just starts to compress but are closed with the buffer fully extended.
15. Repeat process for counterweight buffer(s).
16. Fix suitable conduits and wiring.
17. Wire the switch into circuit as advised.
18. Reinstate the lift supply and check operation of the lift verifying the car and counterweight buffer check switches.
19. Monitor the operation before returning the lift to passenger service.
20. Remove the landing Safety Barrier at bottom entrance.
21. Remove the "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 AL1 AL2

AP1 AP2 AP3 AP4 AW1 AW4 AW7 AM1 AM2 AM3

Method Statement
Access for Maintenance of Equipment in the Lift Shaft

1. All appropriate PPE to be worn.
2. Erect portable barrier around top floor entrance if required.
3. Call lift to top floor, ensure the car is empty, input 2 car calls.
4. Stop the lift using the landing door release.
5. Check lift has stopped and activate the lift stop switch.
6. Close the landing doors and place a landing call.
7. Open landing door and activate the car light and place the lift on inspection control and remove the stop switch, then close the landing doors.
8. Input a landing call.
9. Open the landing door and check the lift has not moved and activate the stop switch.
10. Before accessing the car top a mental job hazard analysis should be undertaken to ensure the car top is safe to work on. i.e. no fluid, needles, debris or tripping hazards.
11. Shaft lighting if available should be switched on.
12. General cleaning, greasing operation and adjustment of landing entrances, guides, car equipment and ropes can then be carried out.
13. Access to the pit will be required when checking and adjusting equipment under the car. This must only be done with the car on inspection control or if movement is not required the power supply should be locked and tagged out.
14. When works have been completed the lift should be returned to the top floor and reinstated to normal service and the barrier removed (if used).

A1 A3 A4 A5 A6 A7 A8 A9 A11 AP1 AP2 AP3 AP4 AW1 AW2
AW3 AW6 AM3

Note:

Any oily rags or old oil to be returned to main branch office, for disposal in appropriate manner.

Issue No. 1

CLEANING SCHEDULE

Finished Stainless Steel

Material

Method

Finished Stainless Steel

Much of the popularity of stainless steel stems from the fact that it offers an attractive appearance combined with excellent corrosion resistance, which ensures a long service life with little maintenance. There is no need for painting, protective coatings or replacement of corroded parts, as is so often necessary with other materials.

The corrosion resistance of stainless steel is due to the presence of a chromium-rich oxide film on the surface. This film is tightly adherent and self-repairing if the surface is broken or damaged by grinding, sawing, scratching or knocking – provided there is a source of oxygen present.

Failing to clean stainless steel can lead to a deterioration of the surface appearance and can sometimes – quite needlessly – result in corrosion.

Proper cleaning will ensure that the steel retains its original finish throughout its life.

All grades of stainless steel will stain and discolour due to surface deposits and can never be accepted as completely maintenance free. In order to achieve maximum corrosion resistance the surface of the stainless steel must be kept clean. Provided the cleaning schedules are carried out on a regular basis, good performance and long surface life are assured.

Clean with chamois leather or sponge, warm water and mild detergent. Stainless steel can also be treated by specialist using stainless steel oil, such as 3M Specialist Cleaning Fluid.

Scratches and marks can be relished by a specialist.

Method Statement
Access to motor room via hooped ladder.

1. Inform customer and / or site representative.
2. Ensure area has suitable barrier in place to prevent unauthorised persons entering designated ladder area.
3. Tools and equipment must be placed in a safe area away from the ladder base area.
4. Manoeuvre the lower ladder from its locked cabinet into the correct position ensuring that it is correctly in place, steady and at the correct angle.
5. Check standing area and boot soles for oil and contamination which may cause slippage. Ascend ladder carefully ensuring hand holds are maintained at all times. Transfer onto the vertical portion of the ladder to a comfortable level for the unlocking of the machine room door.
6. Before pushing the door open, check that there is no possibility of any persons within the machine room area, by voice or other means of communication. Partially open the machine room door, and re-check that there is no possibility of striking a person behind the arc of the door opening area.
7. Switch on the machine room lights before entering the machine room to further check for door clearance and to ensure that you have safe egress from the ladder.
8. Once safely alighted from that ladder and in a safe position the machine room door must be locked in the fully open position, via bracket and lock system on the adjoining wall. At all times while the machine room is occupied, the door must remain in the locked open position.
9. The sliding beam system can then be positioned for the hoisting of tools and equipment. Ensure that the beam has the correct testing marks and visually check the beam and attachments for damage or failure. Lower the rope and hook system to the area where tools and equipment are positioned. Descend the ladder, connect the hook system to the tool box ensuring that the correct safe working load of the lifting equipment is strictly adhered to.

APEX LIFTS

10. Ascend the ladder as before and again, ensure safe egress as above. Once in a safe and comfortable position and proceed with the lifting of the tools or equipment. A steady rope must always be used to prevent swinging of equipment whilst being hoisted. At all times, check that the possible falling area is clear and the hoisting area is safe.
11. When works are complete, the reverse of the above applies

Method Statement
Access for Maintenance of Motor Room Equipment.

1. All appropriate PPE to be worn.
2. Access the motor room ensuring access route is safe from fluids, solids and needles.
3. Run the lift from top to bottom on inspection control and check condition of the ropes.
4. Isolate the power supply and carry out cleaning and greasing of the motor, governor, controller and motor room.
5. Reinstate power supply and check operation of controller on normal service.
6. Check operation of the motor and brake on normal service.
7. If any adjustments on the motor, brake or controller are to be made the power supply should be isolated if not required.
8. Sign the log card.
9. Leave motor room and ensure all locks are made.

A1 A3 A4 A6 A7 A8 A9 A11 AM1 AM2 AM3

Note:

Any oily rags, batteries or oil to be returned to the main branch for disposal in appropriate manner.

Method Statement
Isolate Ducting

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Rubber insulation will be placed onto the ducting in front of controller.
4. This will then be bonded on using an appropriate adhesive.
5. The area is to be kept ventilated while these works are carried out.

A3, A7, A9, AM3

Issue No. 1

Method Statement
Introduce a Motor Room Emergency Stop Switch

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Display "Out of Service" signs at all landings.
6. Gain exclusive control of the lift movement.
7. Ensure the lift is isolated effectively and locked off.
8. Using a meter, ensure all supplies are at zero volts.
9. Determine the position of the stop switch, mark out fixings and secure in position.
10. Fix suitable conduits and wiring.
11. Wire the switch into circuit as advised.
12. Reinstall the lift supply and check operation of the lift, verifying the stop switch.
13. Monitor the operation before returning the lift to passenger service.
14. Remove the "Out of Service" notices.

A1 A2 A3 A4 A6 A7 A9

AW7

Method Statement
New Car Indicator

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Isolate the supply and lock out.
8. The car front will be cut out with a jigsaw to allow a back box and faceplate to be fitted.
9. The back box will be fitted in position and wiring from the controller placed in the box.
10. The indicator will then be wired, and fitted in position.
11. The controller will then be wired.
12. The power supply will then be reinstated and the indicator checked at all floors.
13. All notices removed.

A1 A2 A3 A4 A6 A7 A9

Method Statement
Paint Rotating Parts in Machine Room Yellow

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" Notices at all landings.
7. Isolate the lift supply and lock out.
8. Make sure that the motor room supply (which will be separate from the main lift supply) is isolated and locked off.
9. Using a meter, ensure all suppliers are at zero volts.
10. Ensure the entrance to the machine room is protected by suitable Barriers to prevent access by unauthorised persons.
11. Post "No Smoking" signs.
12. Ensure the area is properly ventilated.
13. Comply with the COSHH instructions relating to the degreasing agent and paint.
14. Degrease components as necessary and when surface is clean and free from oil and grease apply paint as directed.
15. It may be necessary to move the lift in order to expose previously inaccessible parts of the sheaves or other components. Carry out the lock and tag out procedure each time the lift is moved.
16. Allow time for the paint to cure.
17. Reinstate the lift and machine room supply.
18. Monitor the operation before returning the lift to passenger service.
19. Remove the Barriers and "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A8 A9 A11 A12 AM1 AM2 AM3

Method Statement
Install Socket Outlets in Motor Room

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the customer.
4. Comply with any special customer requirements.
5. Establish a fused power source.
6. Run conduit and fit 240 outlets.
7. Wire outlets.
8. Connect to power source and test.
9. Mark fused area of operation of fuse.

A2, A3, A4, A5, A6, A7, A9, A11, AM1, AM3

METHOD STATEMENT
INSTALL TAPE HEAD READER

1. Ensure that all appropriate personnel protection equipment is worn.
2. Remember to work safely.
3. Gain exclusive control of lift.
4. Using the lift as a working platform place in a position at the top of the shaft and isolate and lock and tag out.
5. Fit bracketry to the guide.
6. Gain access to the pit area, install pit props.
7. Fit bracketry to the guide in the pit area.
8. Drop metal tape from the top of the lift and fix between the two brackets.
9. Mount bracketry and fix tape head reader to the lift car.
10. Run wiring to the halfway box and connect.
11. Reinstate the lift supply.
12. Run car on car top control and check alignment of the tape head.

A3, A4, A5, A7, AL1, AP1, AP2, AP3, AP4, AW1, AW2, AW3, AW4.

Method Statement
Install Car Handrail

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Position the car at the bottom floor and isolate the power supply and lock and tag.
8. Install landing Safety Barriers at any open entrance.
9. Fit preformed handrail using 18v cordless drill and fixing bolts.
10. During any drilling operation take care not to damage any existing cables.
11. Reinstate the main supply.
12. Monitor the operation before returning the lift to passenger service.
13. Remove the "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A9 A11 AL1 AL2 AP1 AP2 AP3
AP4 AW1 AW2 AW3 AW4 AW6 AM1 AM3

Method Statement
Install Escutcheon Release Boxes

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Fit new escutcheon plate cover boxes using self drilling screws and a 18v battery drill.
6. Check operation of the triangle releases, to give access to the v release plate.

A3 A4 A6 A9

Method Statement
Install Audio / Visual Handwinding Device

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Gain exclusive control of the lift movement.
8. Position the car in the shaft at a convenient height to give access.
9. Install landing Safety Barriers at top floor level.
10. Isolate the lift main supply and lock out.
11. Using a meter, ensure all supplies are at zero volts.
12. Establish 240-volt power supply source, for the new equipment, from a fused 1A-spur unit in the motor room.
13. The unit should be sited for good visibility during hand lowering / winding.
14. Mark out suitable position for Handwinding Unit and conduit run to Controller.
15. During any drilling operation take care not to damage any existing cables.
16. Install Handwinding Unit, conduit, and then wire up between them and the controller.
17. Connect up as advised on wiring diagram.
18. Fit sensor assembly, tubing and wiring to car top.
19. Connect up as advised on wiring diagram.
20. Fit magnet assembly to reflect floor position.
21. Repeat above task for remaining floors.

APEX LIFTS

22. Reinststate the lift main supply and check operation of Handwinding Unit.
23. Monitor the operation before returning the lift to passenger service.
24. Remove the "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A9 A11 A12 AL1 AL2 AP1 AP2 AP4
AW1 AW2 AW3 AW4 AM3.

Issue No. 1

Method Statement
Install Auto Dialler

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Gain exclusive control of the lift movement.
8. Position the car near the bottom level as low gain access to the bottom and top of car.
9. Install landing Safety Barriers at any open entrance.
10. Isolate the lift main supply and lock out.
11. If necessary, arrange for temporary lighting in the working area.
12. Using a meter, ensure all supplies are at zero volts.
13. Fit speech unit in pit area.
14. Fit speech unit on top of car.
15. Fit speech unit in car operating panel.
16. Wire the car as per drawing and attach flexes.
17. Using the car as a working platform run wiring from the motor room to the speaker in the pit area and connect.
18. All connections terminated in the motor room.
19. The system will then be checked to ensure unit rings out to all emergency numbers.

A1 A2 A3 A4 A5 A6 A7 A9 A11 AL1 AL2 AP1 AP2 AW1 AW3
AW4 AM3

Method Statement –
Install Additional Car Top Lighting

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Gain exclusive control of the lift movement.
8. Install landing Safety Barrier at working floor.
9. When in position ensure the lift supply is isolated effectively and locked off.
10. Arrange for temporary lighting in the working area from an external power source.
11. Make sure that the car light supply (which will be separate from the main lift supply) is isolated and locked off.
12. Using a meter, ensure all suppliers are at zero volts.
13. Drill and fix new lighting unit to the top of the car and wire.(Cordless drill to be used)
14. Reinstate 240v supply and test operation of lighting.
15. Remove temporary lighting and monitor lift operation before returning the lift passenger service.
16. Remove Safety Barrier and "Out of Service" Notices.

A1 A2 A3 A4 A6 A7 A11 AL1 AW3 AW4 AM3

Method Statement
Removal of Motor room

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Lay ply on roof outside the motor room door in a safe position that will not present a hazard.
4. Enter the motor room and switch off and lock off power supply.
5. Unbolt all motor room equipment and manually take out and place on ply, outside motor room door.
6. Ensure correct goggles are worn and only using correct 110volt equipment. Break up concrete slab using kango and sledge hammer.
7. Manually lift broken slab out of motor room and onto the ply.
8. Ensure all stacked in a safe manner and removed from roof with crane using correct banksman techniques.

Note : where manual handling is involved, ensure correct practice is used and carried out in the manner of Risk Assessments for manual handling as supplied in the Health and safety site documentation.

Method Statement
Asbestos Removal

1. Ensure that you use all appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Display out of service notice to all floors.
6. Before entering any area that could be contaminated with asbestos the appropriate equipment shall be issued by the asbestos Removal Company and worn.
7. Gain exclusive control of the lift and place the lift car in the appropriate position and then isolate the lift supply.
8. If the landing door adjacent to the lift car is to be left open it must be barriered off by asbestos Removal Company.
9. On completion of task a safe area for removal of safety equipment and washing facilities must be made available.
10. On any return visits to move the lift car all precautions as above are to apply.

Method Statement
Repair Car and Landing Locks

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safety.
3. Report to the Customer and comply with any special requirements.
4. Gain exclusive control of the lift movement.
5. Display "Out of Service" signs at all landings.
6. Verify the correct operation of the top of the car inspection control.
7. Position the car at a convenient height to give access.
8. Install landing Safety Barriers at the working floor level.
9. Check guide and car guide shoes.
10. Repair landing headers and replace broken landing lock .
11. Place safety barriers at the ground floor entrance, and position the lift car as to be able to work on the entrance from within the lift car.
12. Isolate the lift supply.
13. Repair landing header and set up locks.
14. Resight barriers on the 1st floor and move the lift halfway up the entrance and isolate the supply.
15. Straighten out car entrance and replace the skate and the detectors.
16. Lower the car doors so that the car door shoe engages deeper into the sill.

APEX LIFTS

- 17. Refit Faciers.
- 18. Check all running clearances.
- 19. Removing all barriers and notices.

A1 A2 A3 A4 A5 A6 A7 A9 A10 A11

AL1 AL2 AP1 AP2 AW1 AW2 AW3 AW6

AM3

Method Statement
Access for Maintenance of Equipment in Pit Area

1. Ensure that you use the appropriate PPE
2. Erect portable barrier at bottom entrance.
3. Call lift to bottom landing and send up using 2 car calls.
4. Stop lift on travel using door release to break the lock circuit; and gain access to the pit area.
5. Activate the lift switch.
6. Open landing doors and place a landing call.
7. Open landing doors and ensure that the car has not moved.
8. When accessing the pit area, ensure the landing doors are blocked open.
9. Access pit area ensuring area is safe to do so; beware needles, water etc.
10. Clean out pit area ensuring any needles are placed in containers provided, using the correct tooling.
11. Check governor, tension frame, guides, buffers and door shoes, clean and lubricate to suit.
12. Exit lift shaft and reinstate lift to normal service.
13. Remove barrier
14. Dispose of rubbish into local containers, any hazardous material to be taken to main branch office for disposal in correct manner.

A1 A3 A4 A5 A6 A7 A8 A9 A11 AL1 AL2 AP1 AP2 AP3 AP4 AW1

Method Statement
Maintenance of Lift General

1. All appropriate PPE to be worn.
2. Gain control of the lift via internal key switch.
3. Check all car functions i.e. buttons, lights, indicators, alarm, auto dialler and car door detectors.
4. Check operation of car doors.
5. Check landing pushes and indicators.
6. Adjust, replace or report any failures of car and landing equipment.
7. Reinstate car to normal service.

A3 A4 A5 A6 A7 A8 A9 A11

Note:

On any replacement/repair, if the lift supply is not required, the supply should be locked and tagged out to isolate the equipment.

Method Statement
Supply and Fit Rubber Controller Mat

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Mats should be positioned at the front and rear (if applicable) of each Controller.
6. The mat should be cut to a size suitable to match the Controller width and fitted rib side down.

A3 A4 A6 A7 A9

Method Statement
Upgrade Machine Room Lighting

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Isolate the supply and lock out.
8. Arrange for temporary lighting in the working area from an external power source.
9. Make sure that the motor room supply (which will be separate from the main lift supply) is isolated and locked off.
10. Using a meter, ensure all supplies are at zero volts.
11. Establish a suitable power supply source for the new equipment.
12. Mark out suitable position for the replacement light fittings and routing of conduit run.
13. Install the new fittings, conduit and wiring to the previously established connection point.
14. Carry out the IEE 16th Edition Electrical Tests.
15. Reinstate the lift and machine room supply.
16. Complete test procedure and certification of the new machine room lighting.
17. Remove temporary lighting.
18. Monitor the operation before returning the lift to passenger service.
19. Remove the "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A9 A11 A12 AR1 AR2 AR3

Method Statement
Supply Fire Extinguisher

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Gain entry to motor room.
5. Mount fire extinguisher near door entry.
6. Use 18v cordless drill to fix bracket to wall.
7. Place extinguisher onto the bracket.
8. Inform customer to enable the unit to be checked with other extinguisher on site at regular intervals.

A2 A3 A4 A6 A7 A9

Method Statement
Supply Door release Keys

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Place door release keys in the motor room and issue to the customer.

A3 A4 A7 A9

Method Statement
Supply Safety Barrier

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. The barrier can be used either on the landing or the car entrance.
When used on the landing, it should be secured by locating the pegs on the bottom of the barrier into the bottom track and extending the telescopic poles to the underside of the architrave, locking it in position.
6. Establish from the Customer a safe and secure storage area before leaving site.

A3 A4 A7 A9 AP1 AP2 AP3 AP4 AW1 AW2 AW4 AW7
AR1 AR2 AR3

Method Statement
Removal of Disabled Hoist

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Close off area to allow dismantling of lift and structure.
7. Using the platform dismantle the top section of enclosure and store in safe area.
8. Remove platform and drive unit and store safely.
9. Remove remaining enclosure and store safely.
10. Ensure live supply is left in safe condition and isolated.
11. Inform site contact on completion of works.

Method Statement
Replace Controller

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Isolate and tag off the supply feeding the lift main isolator.
8. Using a meter, ensure all supplies are at Zero voltage.
9. Remove and mark all wiring.
10. Unbolt controller and store in safe area.
11. Site new controller and connect all wiring.
12. Install any new shaft switches, tape heads etc.
13. Carry out test of all circuits, overloads and make any adjustments necessary.
14. Monitor the operation of the lift.
15. Remove out of service signs.
16. Remove all tooling and redundant material.

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 AM1 AM2 AM3
AL1 AL2 AP1 AW1 AW2 AW3 AW4 AW6 AW7

Method Statement
Raising Landing Entrances

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to Customer
4. Comply with any special Customer requirements.
5. Display "Out of Service" signs at all floors.
6. Safety barriers placed in front of lift door area.
7. Gain exclusive control of the lift movement.
8. The lift car will then be used as a working platform.
9. If the lift is not required to move for any length of time it will be locked out and tagged.
10. The landing entrance will then be raised.
11. The transom panel will be removed and replaced with a new panel.
12. All levelling switches appertaining to the 4th floor level will be adjusted to allow for accurate floor levelling.
13. The lift will then be placed on attendant service and the floor levels checked.
14. The lift barrier and signage will then be remove and the lift left in normal service.

A1 A2 A3 A4 A5 A6 A7 A9 A11 A12 AL1 AL2 AP1 AP2 AP3
AW1 AW2 AW3 AW4 AW6 AM1 AM2 AM3

Method Statement
Removal of welded Cills from
Cill Angles on Lift Landings

1. Obtain Hot Work Permit.
2. Liaise with building/site manager to get local smoke detectors isolated.
3. Ensure area of work is free from combustible material. If this is not possible these should be protected with a suitable non combustible material.
4. A fire extinguisher is to be present at all times.
5. Grind off welds to allow removal of cills.
6. Check all areas for any signs of fire/smoldering etc.
7. Check all areas at half hour intervals and then **two hours after the work is finished.**
8. Inform building/site manager work is complete so that the smoke detectors can be reinstated.

USING THE R.C.D. POWER BREAKER

The R.C.D. power breaker is designed to eliminate electric shocks from items that use a direct Mains power source.

- 1) Each power breaker is supplied with a set of operating instructions; these are to be kept in good condition and with the power breaker.
- 2) Before use always ensure that the power source to be used is not damaged in any way and that it is secured.
- 3) Always follow the step by step operating instructions supplied.
- 4) Included within the operating instructions is the technical data specifications. These specifications are not to be exceeded
- 5) Before use always carry out the test procedure specified in the operating instructions marked "step one".
- 6) If at any time the power breaker becomes damaged or fails to operate please return it to the Workshop for repair/replacement.
- 7) Before any appliance is plugged into the power breaker the appliance must be checked visually
For any damage that might cause the appliance to malfunction.
- 8) Only pre-tested equipment may be plugged into the power breaker
- 9) At no time may any member of staff alter or modify the power breaker in any way

Method Statement
Supply and Fit New Door Operator and Car Doors.

1. Ensure that you use the appropriate personal protection equipment.
2. Remember to work safely.
3. Report to customer.
4. Comply with any special customer requirements.
5. Display "out of service" signs at all floors.
6. Gain exclusive control of the lift movement.
7. When in position ensure the lift supply is isolated effectively and locked off.
8. Using a meter, ensure all supplies are at zero volts.
9. Remove all redundant door operator equipment, car doors, uprights bracketry.
10. Fit new header section and posts, set up car doors and align new operator and linkages.
11. During any drilling operations, take care to ensure that any existing cables are not damaged.
12. Set up operator and check operation.
13. Remove safety barrier and "out of service" notices.

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 AL1 AL2

AW1 AW2 AW3 AW4 AW6 AW7 AM1 AM2 AM3

Method Statement
Supply and fit Emergency Car Lighting

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Gain exclusive control of the lift movement.
8. Install landing Safety Barrier at working floor.
9. When in position ensure the lift supply is isolated effectively and locked off.
10. Arrange for temporary lighting in the working area from an external power source.
11. Make sure that the car light supply (which will be separate from the main lift supply) is isolated and locked off.
12. Using a meter, ensure all suppliers are at zero volts.
13. Establish power source on car top for new equipment.
14. Mount light unit on lift car ceiling.
15. During any drilling operations, take care to ensure that any existing cables are not damaged.
16. Run power supply cables to power supply and connect.
17. Reinstate the car light supply and check operation.
18. Remove temporary lighting and monitor lift operation before returning the lift passenger service.
19. Remove Safety Barrier and "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 AL1 AL2

AW1 AW2 AW3 AW4 AM3

Method Statement
Supply and Fit Lift Notices

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. All notices should be permanently fixed in place by means of screws or adhesive that is supplied in the pack. Where labels are self-adhesive, ensure the surface where you are intending to locate them, is free from oil, grease or other contaminants. To ensure these labels do not peel off, create a seal around the edge with clear nail varnish.

A3 A4 A6 A7 A9

Method Statement
Supply and Fit a Governor Tension Weight Switch

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Gain exclusive control of the lift movement.
8. Fit landing Safety Barrier at bottom entrance.
9. Position the lift to allow safe access and egress to the pit area.
10. When in position ensure the lift is isolated effectively and locked off.
11. Using a meter, ensure all supplies are at zero volts.
12. If there is no permanent pit ladder, ensure you use a portable ladder for safe means of access and egress.
13. Fix switch in position to ensure that if tension weight drops, due to rope stretch or breakage, the switch contacts open before the weight grounds on the pit floor.
14. Fix suitable conduits and wiring.
15. Wire the switch into circuit as advised.
16. Reinststate the lift supply and check operation of the lift verifying the car and counterweight buffer check switches.
17. Monitor the operation before returning the lift to passenger service.
18. Remove the landing Safety Barrier at bottom entrance.
19. Remove the "Out of Service" Notices.

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 AL1 AL2

AP1 AP2 AP3 AP4 AW1 AW4 AW7 AM1 AM2 AM3

Method Statement
Supply and Fit Isolator Lock Off Facility

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Isolate and tag off the supply feeding the lift main isolator.
8. Using a meter, ensure all supplies are at zero volts.
9. Mark suitable switch position on the side, below or as close to the original main switch as possible.
10. During any drilling operations, take care to ensure that any existing cables are not damaged.
11. Install lock off switch in chosen position.
12. Install wiring and connect up in existing phased sequence.
13. Reinstate the lift supply.
14. Test operation of new switch.
15. Monitor the operation before returning the lift to passenger service.
16. Remove "Out of Service" notices.

A1 A2 A3 A4 A6 A7 A9 A11 A12 AM1 AM2 AM3

Method Statement
Shortening of Main Hoist Ropes

1. Arrive on site with all tooling and equipment, report to the customer or customer's representative: ensuring that previous arrangements have been made to remove the lift from normal service and to check if any special customer requirements are to be met, in case of fire, first aid, work permits, or hot work permits etc.
2. Place out of service notices on all floors.
3. Gain exclusive control of the lift via the Top of car controls.
4. A certified lifting tackle will then be positioned at the top of the shaft.
5. Place safety barrier in front of basement doors to allow access to the pit area to place prop under the counterweight.
6. The lift will then be driven up on inspection speed until the counterweight buffers. The power supply will then be isolated.
7. A rope clamp will then be placed on the ropes. The lifting tackle will then be used to lift the car to allow slack rope.
8. Only one rope at a time will be removed and shortened.
9. Once all ropes have been shortened the lift will be put back into normal service in the reverse of the above procedure.

All notices will be removed and the customer informed.

Method Statement
Replace Main Ropes

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember work safety.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Place dustsheets on relevant floors and place safety barriers on floors to be accessed.
8. Gain access to the top of car and position car and counterweight at workable heights.
9. Place certified tackles and stumps in position.
10. Isolate and tag off the supply feeding the lift main isolator.
11. Using a meter, ensure all supplies are at Zero voltage.
12. Remove ropes from unit and store off site.
13. Fit new suspension ropes.
14. Terminate ends of the rope at the counterweight and car.
15. Adjust rope for correct runbys.
16. Remove tackles and stumps and check operation of lift on inspection speed.
17. Place lift back into normal service and remove all signage.
18. Inform customer of completion of works.

A3, A4, A5, A6, A7, A9, A11 AL1, AL2, AP1, AP2, AP4 AW1, AW2, AW3,
AW4, AW5, AW6, AW7 AM1, AM2, AM3, AM4

Issue No. 1

Method Statement
Replace Governor Ropes

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Report to the Customer.
4. Comply with any special Customer requirements.
5. Gain exclusive control of the lift movement.
6. Display "Out of Service" signs at all landings.
7. Working from the top of the lift remove old governor rope.
8. Take the car to the top of the shaft and pass the governor rope over the governor and attach to the car hitch.
9. Drive the lift down to the lower level.
10. Fit the pit props and landing barriers.
11. Isolate and tag off the supply feeding the lift main isolator.
12. Using a meter, ensure all supplies are at Zero voltage.
13. Drop the governor rope and return to the bottom rope hitch and terminate.
14. Remove pit props and barriers.
15. Place lift back into normal service and remove all signage.

A3, A4, A5, A6, A7, A9, A11 AL1, AL2, AP1, AP2, AP4 AW1, AW2, AW3, AW4, AM3,

APEX LIFTS

Method Statement Replace Controller

1. Ensure that you use the appropriate Personal Protection Equipment.
2. Remember to work safely.
3. Gain exclusive control of the lift movement.
4. Isolate and tag off the supply feeding the lift main isolator.
5. Using a meter, ensure all supplies are at Zero voltage.
6. Remove all wiring.
7. Unbolt controller and store in safe area.
8. Site new controller and connect all wiring.
9. Install any new shaft switches, tape heads etc.
10. Carry out test of all circuits, overloads and make any adjustments necessary.
11. Monitor the operation of the lift.

A2 A3 A4 A5 A6 A7 AM2 AM3

COSHH ASSESSMENT

Project	Date: 06/06/03	Issue:	Sheet:
DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited		1	1 OF 3

Hazard Identification and Analysis				Preventative Action Record		
Action No.	Substance	Description of Risk	Precautions to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
1	Jizer	Ingest, eyes, nose, throat skin by contact	Do not use in confined spaces; use protective clothing, goggles and gloves.	Flash point 57c	CON M	Wash affected contact area. Ingest: seek medical advice ██████████
2	Alvania Grease RA	Ingest eyes, nose, and throat.	Prevent the spread of product entry into drain/water system protective clothing and gloves	Store away from direct heat	CON COM M	Dispose of in sealed container.
3	Stop Rust Primer	Inhale, ingest eyes, nose, throat skin by contact	Do not use in confined spaces; ensure ventilation is available, protective clothing, goggles, and gloves respirators.	Store away from food stores	CON	Wash affected area. Inhale / Ingest: seek medial advice
4	White spirit	Inhale, ingest eyes, nose and throat	Protective clothing: gloves, mask, goggles. Ensure ventilation is available.	Avoid direct sun light, keep away from other flammable products.	CON	Wash affected area. Inhale: seek medical advice. Ingest: hospital immediately.
5	Adlock 121	Inhale, ingest eyes, note and throat.	Protective clothing: gloves, goggles and mask. Do not use in	Keep away from heat, sparks or ignition sources	CON	Wash affected area. Inhale / Ingest: seek medical . advice.

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confined spaces, ensure ventilation is available.

COSHH ASSESSMENT

Project	Date: 06/06/03	Issue:	Sheet:
DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited		1	2 OF 3

Hazard Identification and Analysis				Preventative Action Record		
Action No.	Substance	Description of Risk	Precautions to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
6	RS penetrating Fluid	Inhale, ingest eyes, nose and throat	Protective clothing, mask, use of barrier cream	Store below 50c	CON COM M	Wash affected area. Inhale / Ingest: seek medical advice.
7	Suprega	Ingest Eyes, nose and throat	Ensure when washing only use on hands. Rinse well.	None	S1, CON COM M	Eyes: wash well 10 minutes. Ingest: rinse seek medical advice.
8	Bromel Brofloor	Inhale, ingest eyes, nose and throat	Protective clothing: gloves, goggles and mask. Do not use in confined space ensure ventilation is available.	Store in cool place away from ignition sources.	CON	Eyes: wash well 10 minutes. Inhale / Ingest: seek medical advice.
9	Doromus Oil B	Ingest eyes, nose and throat	Protective clothing: mask, gloves and goggles.	Store under cover away from direct heat.	CONS	Eyes: wash well 10 minutes Ingest: seek medical advice.

COSHH ASSESSMENT

Project	Date: 06/06/03	Issue:	Sheet:
DESIGN REVIEW STAGE: Apex Lift & Escalator Engineers Limited		1	3 OF 3

Hazard Identification and Analysis				Preventative Action Record		
Action No.	Substance	Description of Risk	Precautions to Reduce Risk	Remaining Risk	Phase SI - Site investigation CON - construction COM - Commissioning M - Maintenance D - Demolition/Decommissioning	Proposed Action to Control Remaining Risk by Contractor
10	Bromel Gloss	Inhale, ingest eyes, nose and throat	Protective clothing: gloves, goggles, and mask. Do not use in confined space. Ensure ventilation is available.	Store in cool place away from ignition sources.	CON	Eyes: wash well 10 minutes. Inhale / Ingest: seek medical advice.
11	BP Maccurat 68 & 150	Ingest Eyes, nose and throat	Protective clothing: gloves and goggles.	Store away from ignition sources.	CON M	Eyes: wash well 10 minutes. Ingest: seek medical advice.
12	Duckhams Q51 51	Ingest Eyes, nose and throat	Protective clothing: gloves and goggles	Store away from ignition sources.	CON M	Eyes: wash well 10 minutes. Ingest: seek medical advice.

RECORD OF ACCIDENT & DANGEROUS OCCURRENCES

RECORD OF ACCIDENT & DANGEROUS OCCURRENCES

NAME, ADDRESS, OCCUPATION OF INJURED PERSON	DATE OF ENTRY AND SIGNATURE	PLACE, DATE & TIME OF INCIDENT	CAUSE AND NATURE OF INJURY



APEX LIFT & ESCALATOR ENGINEERS LTD

SITE SAFETY SURVEY

INSTALLATION

MAJOR REFURBISHMENT

MAJOR REPAIRS

SITE ADDRESS:
.....
.....

CUSTOMER:

PRINCIPAL CONTRACTOR:

COMPANY SAFETY CONTACT:

SITE SAFETY CONTACT:

DATE OF SURVEY:

CARRIED OUT BY:

SIGNED:

RANKING HAZARDS BY RISK

TOTAL RISK = SEVERITY ESTIMATE X PROBABILITY ESTIMATE.

<u>SEVERITY RATING OF HAZARD</u>		<u>VALUE</u>
<u>CATASTROPHIC</u>	IMMINENT DANGER EXISTS HAZARD CAPABLE OF CAUSING DEATH	1
<u>CRITICAL</u>	HAZARD CAN RESULT IN SERIOUS ILLNESS, SEVERE INJURY	2
<u>MARGINAL</u>	HAZARD CAN CAUSE ILLNESS, INJURY EXPECTED NOT TO BE SERIOUS	3
<u>NEGLIGIBLE</u>	HAZARD WILL NOT RESULT IN SERIOUS INJURY OR ILLNESS	4

PROBABILITY RATING OF HAZARD

<u>PROBABLE</u>	LIKELY TO OCCUR IMMEDIATELY	1
<u>REASONABLY PROBABLE</u>	PROBABLY WILL OCCUR IN TIME	2
<u>REMOTE</u>	MAY OCCUR IN TIME	3
<u>EXREMLEY REMOTE</u>	UNLIKELY TO OCCUR	4

APEX LIFTS

SITE SAFETY SURVEY

Health and safety at Work Act 1974 states "It shall be the duty of every employer to ensure, so far as is reasonably practicable, the Health, Safety and Welfare of all his employees.

SITE ARRIVAL	YES	NO	N/A
1. Is there arrangements to deal with workers new to site (induction)?			
2. Is there a person appointed for site safety co-ordination?			
3. Are there any specific survey arrangements			

ACCESS

HASAW2 (2XD) " So far as is reasonably practical as regards any place of work under the employers control, the maintenance of it in a condition that is safe and without risks to health and the provision and maintenance of means of access to and agree from it that are safe and without such risks". Reference must also be made to Section 3 and 4 of the Health and Safety at Work Act.

	YES	NO	N/A
4. Is access to place of work safe?			
5. Are walkways sound and free from obstruction?			
6. Is edge protection provided where distance to ground is more than 2m?			
7. Are holes/voids fenced or protected with covers?			
8. Is lighting to and from place of work adequate?			

LADDERS

Construction and Maintenance of ladders and folding step ladders Construction (Health, Safety and Welfare) regulations 1996. "Every ladder and folding step ladder shall be of good construction, of suitable and sound material and adequate strength".

	YES	NO	N/A
9. Is a ladder suitable or should it be scaffold?			
10. Is the ladder in good condition?			
11. Is the ladder secured?			
12. Is the ladder long enough or adequate for the job?			

APEX LIFTS

SCAFFOLDS AND WORKING PLATFORMS

CONSTRUCTION AND MATERIAL

Construction (Health, Safety and welfare) Regulations 1996 "Every scaffold and every part thereof shall be of good construction, of suitable and sound material and of adequate strength for the purpose for which it is used". (Regulations 7.30 refers).

	YES	NO	N/A
13. Is there proper access to scaffold?			
14. Is there F.91 signed and up to date?			
15. Is the scaffold inspected at least once a week?			
16. Is scaffold stable?			
17. Have any uprights, ledges, braces, struts or handrails been removed?			
18. Are working platforms fully boarded and in sound condition?			
19. Are boards fixed down?			
20. Are toe guards fitted on scaffold over 2m?			
21. Are there any warning notices e.g. incomplete scaffold, danger?			

CRANES AND LIFTING EQUIPMENT

The Construction (Lifting Operations) Regulations 1961 "Every lifting appliance and every part thereof including all working gear and all other plant or equipment used for anchoring or fixing such appliances shall:-

- (a) Be of good mechanical construction, sound material, adequate strength and free from patent defect.
- (b) Be properly maintained.
- (c) As far as construction permits be inspected by a competent person. A report (Form 91, part 1, Section C) of the inspection shall be made.

	YES	NO	N/A
22. Is the driver of the crane trained, competent and over 18?			
23. Does the driver and banksman know weight of load?			
24. Is there an automatic safe load indicator fitted?			
25. Is safe working load (SWL) clearly marked?			
26. Has lifting gear and slings been tested?			
27. Is lifting gear in good condition?			
28. Has the operator of lifting equipment been trained?			
29. Is the lifting beam(s) in good condition and have SWL clearly marked?			
30. Has examination of mounting points for lifting been carried out?			

APEX LIFTS

ELECTRICAL

Electricity at Work Regulation 1989.

	YES	NO	N/A
31. Has a temporary electrical supply been arranged for use?			
32. Is 110 volts available?			
33. Is residual Current Devices (RCD) fitted to tools and equipment that operate on 240v ac?			
34. Have portable electrical tools and equipment been examined?			
35. Are there any signs of damage to wires, cables or extension leads?			
36. Are all connections to power points made by correct plugs?			
37. Are plugs attached properly so that cable grips hold cable firmly?			
38. Is there a permit to work procedure where necessary?			
39. Have precautions been taken up for Live Working?			

FIRE

Fire precautions Act 1971

	YES	NO	N/A
40. Are suitable and sufficient fire extinguishers available for use?			
41. Do you and your site personnel know the site fire drill?			
42. Do you and your site personnel know what to do in an emergency?			

NOISE

Noise at Work Regulations 1989

	YES	NO	N/A
43. Is an assessment necessary?			
44. Has an assessment already been carried out for noise risks?			
45. Is ear protection available?			

HEALTH

	YES	NO	N/A
46. Have all hazardous substances been identified and assessed e.g Asbestos, Solvents etc?			
47. Is information available for hazardous substances?			
48. Is personal protective equipment available?			
49. Are hard hats used?			

APEX LIFTS

MANUAL HANDLING

	YES	NO	N/A
50. Can it be avoided where there is a risk of injury?			
51. Has an assessment been carried out?			

PROTECTIVE EQUIPMENT

	YES	NO	N/A
52. Is suitable equipment provided to protect the head eyes, hands and feet where appropriate?			
53. If you are working at heights of more than 2 metres is a harness provided and worn and are attached points available?			
54. Has training been given on use and care?			
55. Do you wear it?			

WELFARE

	YES	NO	N/A
56. Is there a suitable toilet available?			
57. Are there washing facilities available?			
58. Is there a suitable first aid box?			
59. Is clothing available for inclement weather?			
60. Are there eating facilities available?			

LIGHTING

Work place (Health and Safety Welfare) Regulations 1992 Reg 8:

“Every work place shall have suitable and sufficient lighting, so far as is reasonably practical, be by natural light. Suitable and sufficient emergency lighting shall be provided in any room in circumstances in which persons at work are specially exposed to danger in the event of failure of artificial lighting.

	YES	NO	N/A
61. Is machine room lighting suitable and sufficient?			
62. Is lift well lighting suitable and sufficient?			
63. Is lift pit lighting suitable and sufficient?			
64. Is emergency lighting provided in the event of failure of artificial light?			

APEX LIFTS

GENERAL

	YES	NO	N/A
65. Is lift well guarded at each landing?			
66. Are there any risks from other contractors e.g. fumes of adhesive used for carpets?			
67. Are other contractors at risk from lift work?			
68. Are all excessive voids guarded, where work is carried out at heights of 2 metres or more?			
69. Is housekeeping at work site carried out?			
70. Are tools securely fastened to prevent them falling below or is area below barriered?			
71. Will any work be undertaken in a confined space (lift escalator sites are not normally a confined space)			
72. Is there a permit to work system?			

ABRASIVE WHEELS

	YES	NO	N/A
73. Will angle grinders be used?			
74. Is personal protective equipment available?			
75. Has person who mounts abrasive wheel received training?			
76. Is a safe system of work on grinding available?			

ANY SPECIAL CONTRACTUAL REQUIREMENTS

ANY ADDITIONAL RISK

ACTIONS



REPORT FORM ACCIDENT / INCIDENT / NEAR MISS

1. Name of person.		2. Office/Site.	
3. Location of accident/ incident	4. Date of accident/incident	5. Time of accident/incident	6. Date of report.
7. Type of injury.	8. Part of body.	9. Accident/incident type. Type of injury / Affect on Environment	10. Days lost from work.
11. Any financial loss e.g equipment.		12. Discription of damage.	
13. occupation of injured person .		14. line Manager of injured person.	
15. Discribe exactly how the event occurred (include events leading up to the accident/incident) use a separate sheet to continue if necessary.			
16. give details of any witnesses to the accident/ incident.			
17. Provide a simple sketch of the area in which the accident /incident occurred include any equipment or material that may have contributed to the accident/ incident.			

REPORT FORM ACCIDENT / INCIDENT / NEAR MISS

18. What were the immediate causes of the accident / incident (list any unsafe conditions present at the scene that caused the accident / incident) .	
19. What were the basic causes of the accident / incident list the job and organisational factors that caused the unsafe actions and conditions of the accident / incident .	
20. List remedial action to be taken to prevent recurrence (identify who is responsible for completing this work) and give a date of completion. Was Environment Agency Contacted?	
21. Name of investigator.	22. Signature of investigator.
23. Name of reviewer.	24 date of review.
25. Date remedial actions were carried out and by who.	

DEFINITIONS

ACCIDENT: : *An unforeseeable event resulting in injury*

INCIDENT: *An event which does not result in injury, damage or loss, but which may cause interruption of the work process*

NEAR MISS: *An unplanned and unforeseeable event that could have resulted in death, human injury, property damage or other form of loss*

**RIDDOR
HEALTH AND SAFETY
PERFORMANCE DATA
YEAR 1999 - 2004**

YEAR	MINOR	MAJOR	FATAL	DANGEROUS OCCURRENCE	EMPLOYEES	SUB-CONTRACTORS	PUBLIC	TOTAL
1999	0	0	0	5	5X DO	0	0	5
2000	2	1	0	6	6X DO +2X MIN	1X MAJ	0	9
2001	4	0	0	4	4X DO +3X MIN	0	1X MIN	8
2002	0	0	0	4	4X DO	0	0	4
2003	7	0	0	0	7X MIN	0	0	7
2004	13	2	0	3	13XMIN + 1 DO + 1 MAJ/DO	1X MAJ/DO	0	15

2004 until 21st September 2004

APEX LIFT & ESCALATOR ENGINEERS LTD
Pre-Tender Stage
Health & Safety Plan
For a Construction Project

This document has been prepared by Apex Lift & Escalator Engineers Ltd under Regulation 15(1)-(3) of the Construction (Design and Management) Regulations 1994. It provides information on the health and safety requirements of the project.

Clear evidence will be required of the provisions made to control the identified risks, the resources to be allocated for the management of these risks and of the competence to carry out the work to meet legal requirements.

1. Nature of the project:

1.1 Name of Client: **The Royal Borough of Kensington & Chelsea**

1.2 Name of Planning Supervisor: **Butler & Young**

1.3 Project Title: **Grenfell Tower**

1.4 Location: **Lancaster West Estate W11 – HO99 & HO91**

1.5 Nature of Construction work to be carried out:
Three Lift Installations

1.6 Timescale for completion of the construction work:

1.6.1 Date of Commencement on site: **1st February 2005**

1.6.2 Contract period : **52 weeks**

2. The Existing Environment:

2.1 Surrounding land uses and related restrictions:

Response: 24 hours notice will be given before deliveries are carried out to give ample time for clear areas to be arranged and access to the occupied buildings. Toilet and washing facilities will be made available.

2.2 Existing services:

Response: The works that Apex are to carry out shall not in anyway involve the disturbance of underground gas and water mains.

2.3 Existing traffic systems and restrictions:

Response: A secure area will be made available for the storing of materials. An area will be designated for the disposal of old redundant materials and clearing away will be done on a weekly basis within our own vehicles and disposed of in accordance with registration under the Control of Pollution Act 1989.

2.4 Existing structures:

Response: If any inherent hazardous defects are found present at any time, all work shall cease and shall be immediately reported to the Planning Supervisor who shall rectify the problem or find a safe method of working.

2.5 Ground conditions:

Not applicable.

3. Existing drawings:

3.1 Available drawings of structure(s) to be demolished or incorporated in the proposed structure(s):

4. The design:

4.1 Significant hazards or work sequences identified by designers:

4.1.1 Danger Notices and Work Notices will be posted to inform of particular works being carried out.

4.1.2 All redundant materials will be stored in designated area and removed weekly or as deemed necessary.

- 4.1.3 Hoarding will be provided at one floor at a time. The motor room and any ladders shall be suitably locked to stop any non suitably trained persons entering. With a portable barrier for use at other entrances.
- 4.1.4 Any electrical works shall only be carried out by persons in possession of correct qualification and records to prove.
- 4.1.5 Associated builders work will be carried out under our instruction complying with our Health & Safety, risk assessments, Health & Safety Plan. We will have in our possession their qualifications to prove competence to carry out the prescribed work.
- 4.1.6 Guarding will be erected where risks have been identified.

Response:

4.2 The principles of the structural design:

Not applicable

4.3 Specific problems:

4.3.1 Covered within our generic risk assessments as enclosed.

4.3.2 Our Health & Safety Policy Statement as enclosed in our Employees Manual & H&S File.

5. Construction materials:

5.1 Health hazards arising from construction materials:

5.1.1 All employees are trained in the recognition of asbestos and have instructed to report any suspected cases immediately as COSHH regulations. We will inform the appropriate regulating bodies before removal by specialist approved company.

6. Side-wide elements:

6.1 Positioning of site access and egress points:

Response: All employees will meet at a pre designed fire evacuation point where a personal check will be carried out by senior staff.

6.2 Location of temporary site accommodation:
To be agreed.

6.3 Location of unloading, layout and storage areas to be agreed.

6.4 All engineers will be given an introductory site first aid accident and dangerous occurrence training before commencing site work.

6.4 Traffic/pedestrian routes: As 2.1

Occupied premises:

7. As 4.1.3

8. Site rules:

8.1 6.4. and 2.1

Response:

8.2 Means of escape: It is envisaged that no fire escape route will be obstructed or changed, if in future design this becomes necessary, no action will be taken before parties are informed and signs displayed. We presume that any person that require the lift for their means of escape shall be decamped before works begin.

See fire safety working in **Grenfell Tower**

Response:

8.3 Skips, plant etc.: Skips will not be required. No toxins will be expected to be used within this contract, if they are required they will be stored within a steel security container and any potential health will be described along with COSHH Guidance sheet before usage.

Response:

9. Liaison arrangements: We would expect regular meetings to check the progress of works, and to modify the health and safety plan when necessary.

Response:

- 9.1 The management and organisation will be dealt with by **G Poynter** will be in overall control of the site. A site file shall be kept on site containing deliveries, daywork records, detailed drawing folder and accident report records.

PART TWO A

LIFT SPECIFICATION

DUPLEX ELECTRIC PASSENGER LIFTS, HO90&91

L2508

**INDEX - PART TWO
LIFT SPECIFICATION**

Clause No.	Title	Page No.
2A.01	Tenders	2A/1
2A.02	Programme	2A/1
2A.03	Products, Equipment and Materials	2A/3
2A.04	Cost of Inspecting Products, Equipment and Materials	2A/3
2A.05	Regulations	2A/3
2A.06	Design Standards	2A/4
2A.07	Related Documentation and References	2A/5
2A.08	Drawings to be Provided	2A/6
2A.09	Drawings and Maintenance Manuals on Completion	2A/7
2A.10	Proprietary Products	2A/8
2A.11	Controller: General	2A/8
2A.12	Controller: Microprocessor Requirements	2A/9
2A.13	Controller: Instrumentation	2A/12
2A.14	Controller: Duplex Lift Control Logic	2A/14
2A.15	Controller: Variable Frequency Vector Drive Power System	2A/17
2A.16	Controller: Door Operator	2A/18
2A.17	Rubber Insulating Mats in Machine Room	2A/19
2A.18	Lift Machine: Electric Traction	2A/19
2A.19	Hoisting Motor: Variable Frequency Vector Drive	2A/20
2A.20	Winding Gear Unit Raft	2A/21
2A.21	Isolation	2A/21

INDEX - PART TWO (Continued)

2A.22	Emergency Hand Winding Operation	2A/21
2A.23	Hand Operation Floor Zone Indicator	2A/22
2A.24	Auxiliary Stop Switch	2A/22
2A.25	Overspeed Governor: Bi Directional	2A/22
2A.26	Guides and Guide Brackets	2A/23
2A.27	Roller Guide Shoes Assemblies	2A/23
2A.28	Buffers	2A/23
2A.29	Pit Ladder	2A/24
2A.30	Pit Stop Switch and Shaft Access	2A/24
2A.31	Limit Switches	2A/24
2A.32	Counterweight	2A/24
2A.33	Counterweight Screen	2A/24
2A.34	Car Sling and Platform	2A/24
2A.35	Car Sub-Floor	2A/25
2A.36	Safety Gear: Bi-directional	2A/25
2A.37	Crown Bar Records	2A/25
2A.38	Car Top Maintenance Control Station	2A/25
2A.39	Car Top and Car Bottom Clearance	2A/26
2A.40	Suspension Ropes	2A/27
2A.41	Rope Terminations and Anchorages	2A/27
2A.42	Rope Stretch and Clearances	2A/27
2A.43	Compensation	2A/27
2A.44	Lift Car: Floor Covering	2A/28
2A.45	Lift Car: Sill	2A/28
2A.46	Lift Car: Toe Guard	2A/28

L2508

INDEX - PART TWO (Continued)

2A.47	Lift Car: Enclosure	2A/28
2A.48	Lift Car: Station	2A/30
2A.49	Lift Car: Auxiliary Car Station	2A/31
2A.50	Lift Car: Pushes	2A/31
2A.51	Lift Car: Load Sensing Device	2A/32
2A.52	Lift Car: Alarm Sounder	2A/32
2A.53	Lift Car: Voice Synthesiser	2A/32
2A.54	Lift Car: Hands Free Auto Dialling System	2A/33
2A.55	Car Intercom and CCTV Equipment	2A/34
2A.56	Lift Car: Lighting	2A/34
2A.57	Lift Car: Emergency Lighting and Alarm Supply	2A/35
2A.58	Lift Car: Forced Ventilation	2A/35
2A.59	Automatic Power Door Operator	2A/35
2A.60	Passenger Protection	2A/36
2A.61	Car and Landing Doors	2A/36
2A.62	Emergency Unlocking of Landing Doors	2A/38
2A.63	Landing Door Frames and Architraves	2A/38
2A.64	Landing Sills	2A/39
2A.65	Landing Fascias	2A/39
2A.66	Landing Stations	2A/39
2A.67	Landing Pushes	2A/40
2A.68	Landing Position Indicators	2A/40
2A.69	Out of Service Indicators	2A/40
2A.70	Firemans Control	2A/41
2A.71	Notices, Labels and Instructions	2A/42

L2508

INDEX - PART TWO (Continued)

2A.72	Guarding	2A/43
2A.73	Machine Room Access	2A/43
2A.74	Painting and Cellulosing	2A/43
2A.75	Tests on Completion and Handing Over	2A/44
2A.76	Maintenance and Remedy of Defects	2A/45
2A.77	Witness Inspection Points	2A/48
2A.78	Drawings	2A/49

PART TWO A - DUPLEX ELECTRIC PASSENGER LIFTS, HO90&91

SPECIFICATION AND STANDARDS OF MATERIALS AND WORKMANSHIP

2A.01 Tenders

The Tenderer shall include for the supply of the whole of the products, equipment and materials in accordance with this specification and the whole of the fixing works necessary for the complete lift installations plus builders, structural, electrical and other associated works as detailed in the tender documentation.

The Tenderer shall visit the site to undertake a detailed survey in order to determine the full extent of the work required. No claims arising out of any misunderstanding or want of knowledge of the nature or extent of the work shall be allowed.

This specification shall be read in conjunction with the conditions of contract and any supplementary specification(s), schedule(s), drawings and other documents enumerated in the invitation to tender. In the event of any discrepancy between the clauses in this specification and any related document the Tenderer shall immediately inform the appointed Supervising Officer, (SO), to provide technical information.

In particular the specification shall be read in conjunction with Schedules 1, 2 and 3 which form the basis for the tender submission and which shall identify the equipment offered. Schedules 2 and 3 must be completed in their entirety and returned together with all other documentary information requested.

Should anything be omitted from this specification, which is fitting and usually considered necessary for due and proper completion of the work, the Tenderer shall verbally bring this to the attention of the SO prior to tender submission with confirmation in a letter prior to submitting the Tender return.

The Tenderer shall make due allowance in his tender return for undertaking the role of Principal Contractor as defined in the Construction (Design and Management) Regulations 1994, (as amended) (CDM).

This shall particularly include a detailed Health and Safety Plan with method statements and risk analysis based on the Contractor's own site surveys submitted to the SO 30 days prior to the site start date. Final copies, incorporating received comments, shall be provided to the SO 14 days prior to the start on site. Site copies, including a complete bound copy of the contract specification, shall be located within the machine room together with the site diary.

2A.02 Programme

The Tenderer shall submit a detailed bar chart programme and method statement for the whole works with the tender. The programme and method statement shall make due recognition of all project stages with the intent to minimise disruption and disturbance during the works.

The Contractor's staff and subcontractors shall carry photographic identification cards and shall wear attire having the company logo or name, throughout the contract programme.

The Contractor shall make adequate provision for achieving all design and manufacturing works prior to commencing work on site. Should the SO be required to perform additional duties or to attend site due to matters that should realistically have been previously identified by the Contractor then any resultant charges by the SO shall be set off against the contract.

Grenfell Tower shall remain fully occupied throughout the project duration and the programme shall make due recognition at all project stages of the intent to minimise disruption and disturbance during the works, with the need for particularly disruptive and noisy operations to be fully co-ordinated with the SO.

Liquidated and ascertained damages shall be attributed to the programme.

Normal hours of working on this contract are 8.00am - 6.30pm Monday to Friday and 8.00am - 1.00pm Saturday.

The Tenderer shall allow for removal of the existing machine room equipment and the sitting of new during weekends, or as otherwise agreed with the SO, for both his lift and sub-contracting operatives.

Drilling, cutting or otherwise of the building fabric shall be programmed and agreed with the SO and shall be undertaken between the hours of 9.30am and 4.30pm Monday to Friday.

The residents of Grenfell Tower are faced with considerable hardship whilst a single lift only operates within a Tower of this height. The Tenderer is invited to propose methods of reducing programme times by alternative safe working practices and shall detail any such proposal in Schedule 2 of the tender return.

Maximum contract durations and proposed dates shall be as detailed below and whilst calendar dates may vary the actual weeks shall not be exceeded. The Tenderer shall advise the preferred programme and achievement thereof within the tender return:

Contract Award	3 rd September 2004	
Re Test Second Lift	6 th December 2004	(2 weeks)
Design, Manufacture, Procurement and Delivery, inc Xmas Shutdown	3 rd January 2005	(17 weeks)
Site Possession, 1 st Lift	3 rd January 2005	
Handover 1 st Lift	17 th June 2005	(24 weeks)
Running In	24 th June 2005	(1 week)
Commence 2 nd Lift	27 th June 2005	
Handover 2 nd Lift	12 th December 2005	(24 weeks)
Running In	19 th December 2005	(1 week)

Note! Each phase includes witness testing, commissioning and snagging.

2A.03 Products, Equipment and Materials

The Tenderer shall clearly identify the products, equipment and materials offered by way of specific part numbers and any other information necessary in Schedule 2. In all cases products offered are to be generic and non-proprietary with spares and support readily available to persons other than the original supplier or installer.

Specialist equipment or data that is required to maintain continuity of service and performance characteristics or to access the equipment shall be provided, with full training, within the Contract and shall **UNEQUIVOCALLY** become the property of The Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd.

If there is any doubt over the compliance of specific items then further details of approved products for this Contract can be obtained from the SO, on request, and the Tenderer shall be deemed to have obtained any such details before submitting the tender return.

Products and equipment approved for use on previous contracts shall not necessarily be approved for use on this Contract and the SO may require the Tenderer to submit, for approval, samples of products and/or equipment.

The type of products offered shall have been in commercial operation for at least two years prior to the tender and shall have a substantial record of reliability whilst operating on continuous duty and under conditions similar to those which shall apply on this project.

The full technical details of any products or items of equipment must be available to the SO at tender stage and, if so requested, the information must be provided within 3 working days.

2A.04 Cost of Inspecting Products, Equipment and Materials

The SO shall have the power to recover from the Tenderer, by deduction or otherwise, the cost of testing any products, materials or items of equipment which the SO requires to be tested and which, when tested, are found to be unsatisfactory.

2A.05 Regulations

It shall be understood that the equipment specified and that the characteristics of the site, particularly dimensions and clearances, may not fully comply with current British and European Standards and these shall be qualified by the Tenderer in the tender return.

Although it is recognised that the existing structural constraints shall prevent full compliance with harmonised European Standards, the requirement is for the lift installation to include all of those items and features that do comply, as far as is reasonably practicable.

The products, equipment, materials and installation shall comply with all relevant statutory instruments and regulations and in particular those listed in Clauses 2.06 and 2.07.

The successful Tenderer shall be required to obtain all necessary authorisations and derogations from their Notified Body and the DTI and due allowance for any costs shall be made within the tender.

Where the existing structural constraints, particularly in the lift pit, at the top of the lift shaft and within the machine room prevent the necessary clearances being obtained for the protection of maintenance and inspection personnel, alternative means or safe systems of work shall be provided to give equal protection and identification of these shall be detailed with the Tender return.

Where the premises concerned are not subject to such statutory controls they shall, for the purpose of the application of this specification, be deemed to be subject to such statutory controls.

The tender shall be based on the regulations current three months prior to the date for return of the tender. If these regulations are amended or new regulations enacted that shall affect the works after that date, the Tenderer, and subsequently the Sub Contractor, shall immediately inform the SO in writing.

2A.06 Design Standards

The equipment and installation shall conform to this specification and to the relevant British Standards including Codes of Practice and, in particular, BS 5655, BS 7255 and EN81-1. Where this specification differs from those standards and codes, the provision of this specification shall prevail.

Reference to British Standards and Codes of Practice shall mean the edition current three months prior to the date for return of tenders. A certificate of compliance with the relevant British Standards shall be provided to the SO on request. Any changes during the course of the contract in the relevant British Standards and Codes of Practice shall be brought to the attention of the SO by the Contractor.

It shall be understood that the existing characteristics, particularly dimensions and clearances, may not comply with current British Standards and these shall be qualified in the tender return.

The lift is required to function under the following conditions without prejudicing the overall performance:

1. Temperature between +5°C and +40°C
2. Dust or dirt laden atmosphere subject to the effects of moisture.
3. Electrically noisy supply and atmosphere.
4. Mechanical vibration.

Unless stated otherwise in this specification the safety factor shall be 5 or greater for all parts of the equipment. The safety factor shall be calculated on the basis of maximum imposed loads and calculations shall be provided to the SO should they be requested.

2A.07 Related Documentation and References

This tender documentation shall be read in conjunction with, and its requirements are in addition to, the general conditions of contract and any drawings and other documents issued with it and listed in this invitation to tender and as set out below.

Health and Safety at Work etc. Act 1974 (HSWA)
Disability Discrimination Act 1995 (DDA)
Management of Health and Safety at Work Regulations 1999 (MHSWR)
Workplace (Health, Safety & Welfare) Regulations 1992 (WPR)
Provision & Use of Work Equipment Regulations 1998 (PUWER)
Lifting Operations & Lifting Equipment Regulations 1998 (LOLER)
Reporting of Injuries, Diseases & Dangerous Occurrences Regulations 1995 (RIDDOR)
The Lifts Regulations, 1997
Factories Act 1961
Electricity at Work Regulations (H&SE).
Offices Shops and Railway Premises Act 1963
LG1 SAFed Regulations
PM26 - Safe Working at Landings
Control of Pollution Act 1974
The Building Regulations
The London Fire Brigade
The London Electricity Board
The Building Industry National Codes of Practice for Passenger Lifts
Supply of Machinery (Safety) Regulations 1992
Electromagnetic Compatibility Regulations 1992
I.E.E. Regulations for Electrical Installations, current edition
CDM Regulations 1994, Managing Construction for Health & Safety
CIBSE - Guide D, Transportation Systems in Buildings
COSHH - Current edition
BS 2633 - Arc welding of ferritic steel
BS 308 - Drawing practice.
BS 3939 - Graphical Symbols for electrical power, telecommunications and electronic diagrams.
BS 4568 - Steel conduits and fittings.
BS 4568 - Metric steel conduit
BS 4678 - Cable trunking.
BS 476 - Fire tests on building materials and structures.
BS 5420 - Degree of protection of enclosures for LV switch gear.
BS 5514 - Overload requirements
BS 5536 - Preparation of technical drawings for micro filming.
BS 5588 - Fire Precautions in the design, construction and use of building
BS 5655 - Lifts and Service Lifts.
BS 5674 - Thermosetting armoured cables
BS 5750 - Quality management system.

BS 6207 - MICC Cables
BS 6231 - PVC insulated cables
BS 6977 - Insulation for lifts and for other flexible connection.
BS 7211 - Thermosetting cables for electrical supplies
BS 7255 - Safe Working on Lifts
EN81-1 - 1998 Safety Rules for the Construction and Installation of Lifts.
EN81-70 - 2003 Accessibility to Lifts for Persons Including Persons with Disability
BS 7671 - Requirements for Electrical Installation
BS ISO 9000, 9001, 9002, 9003 - Quality Assurance
BS EN 60947 - Specification for low voltage switchgear and control gear.
PREN 1050 - Safety of machinery risk assessment
LPS 1207 - Loss prevention standard.

2A.08 Drawings to be Provided

All drawings provided shall be CAD generated by means of AutoCAD Release 14, AutoCAD LT2000 or equivalent software.

Drawings shall follow BS 304 drawing convention and shall be appropriately scaled to a conventional size to best fit the paper i.e. 1:5, 10, 20, 25, 50 or 100 on A4, A3, A2, A1 or A0 paper, to clearly provide the intended information to be given.

1. General arrangement indicating weight and position of all equipment, with loads imposed on the building structure.
2. Details of all cutting away, plinths, channels, apertures and concrete bases, complete with all dimensions in respect of the building structure or lift well and all other builders, electrical or associated requirements.
3. Machine and raft details.
4. Details of the landings, incorporating sill, door, entrance and architrave/trim construction.
5. Construction of landing hoardings, protected areas and Walkway storage areas.
6. Landing push station and other fixtures.
7. Details of car, sling and platform construction.
8. Details of lift car design incorporating hinged car stations and finishes schedule.
9. Details of all engraving to the Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd requirements.
10. The Contractor shall produce a montage incorporating a colour wash isometric drawing of the proposed lift car and samples of the car and landing finishes as agreed by the Royal Borough of Kensington and Chelsea Tenant Management Organisation Ltd, for selection by residents vote.

11. All electrical details relating to existing and new supplies, terminations within the machine room and ratings relative to full and no load, fuses and any other calculations deemed necessary, including operating temperature range and heat output of the equipment.
12. All drawings shall incorporate a finishes and components schedule.

Four copies of drawings 1-4 shall be submitted to the SO for consideration and comment within four weeks of contract award and, allowing one week for comment by the SO, four copies of the as amended drawings shall be issued within a further one week of receipt by the Contractor.

The remaining drawings shall be submitted two weeks after 1-4 with amendments to follow as above.

2A.09 Drawings and Maintenance Manuals on Completion

The Contractor shall provide the following drawings, generated as in 2.08, in accordance with this specification and also a complete maintenance manual as detailed below:-

1. 'As fitted' record drawings.
2. Details of the car and landing door construction and arrangement.
3. Straight line and schematic wiring diagrams for the lift installation, including all electrical apparatus, as wired and fitted. The diagrams shall show the arrangement and marking of all electrical connections and be complete with key reference to symbols and abbreviations used.

One set of the as fitted electrical drawings shall be encapsulated in plastic and wall mounted within the machine room using swivel type brackets.

All electrical drawings shall be to BS 308 using electrical symbols to BS 3939 and be microfilm quality in accordance with BS 5536. Three sets of paper print drawings will be required plus one complete set of microfiche drawings to the system adopted by The Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd.

4. A description of the scope, purpose and manner of working of each system, product or equipment forming part of the lift;
5. A detailed description of circuit operation, including the supervisory logic and motion control;
6. Data on the setting up and testing of the lift equipment;
7. Instructions for dealing with fault diagnosis and remedial action for each system;
8. Instructions detailing functions and usage of any hand held diagnostic or test equipment relating to the controller and floor setting system or door operator.

9. Planned maintenance programme.
10. Any precautions necessary for ensuring Health and Safety and avoidance of misuse together with details of all emergency procedures.
11. Copies of all certificates and inspection reports relating, but not limited, to
 1. Mill certificates for the finished stainless steel used in fabrication of the cars, doors, architraves and other elements of the project.
 2. All type testing and CE marking,
 3. NICEIC tests,
 4. Tests to BS5655 Pt 10,
 5. Lifting beam tests,
 6. Suspension and governor ropes,
 7. Clause 2.70 of the specification, Painting and Cellulosing,
 8. Manuals by specialist subcontractors.
 9. The names, addresses and telephone numbers of the suppliers of all major components;
 10. Spare parts lists for components that normally need to be replaced due to fair wear and tear, together with those considered essential to maintain the lift in service, e.g. certain printed circuit boards.

The lift shall not be deemed to have been accepted nor achieved practical completion until the drawings, maintenance manuals and Contractors Health & Safety File in accordance with CDM regulations have been received and approved.

After submission and approval of the draft manual by the SO, three copies of hard backed maintenance and operating manuals shall be provided.

2A.10 Proprietary Products

Proprietary products, when agreed with the SO, shall in general be inspected and tested against the manufacturer's specifications and shall be furnished with a certificate of conformity or a type test certificate.

2A.11 Controller: General

The control of the lift shall be duplex full collective and fully automatic arranged for operation by passengers without an attendant and serving each floor. It shall incorporate power operated car and landing doors and indication circuits for:

1. Car position,
2. Call acceptance,
3. Lift out of service,
4. Lift undergoing maintenance,
5. Lift on car preference,
6. Electronic hall lanterns,
7. Lift overloaded,
8. Lift under firemans control.

The micro processor shall have 'field proven' components.

Floor selection shall be via a pattern generator encoder with lift position reference holes in a stainless steel tape to determine floor levels, slowing and stopping zones.

The momentary pressure on any number of car or landing pushes, activating call requirement, shall be stored in the system until answered.

The car shall answer the calls in the order in which the landings are reached and once the car has started travelling in one direction it shall answer the car and landing calls for that direction only. The lift car shall not reverse until it has answered the highest or lowest outstanding call.

With no calls on the control system, one lift shall return and park at the Ground Floor, the other lift shall remain at the last floor served.

When the car stops at the required floor in response to a car or landing call, the doors shall automatically open and automatically close after a time interval. This time interval shall be shortened by the operation of a floor push in the car.

Should a passenger wish to re-open the door, pressure on the 'Door Open' push in the car station shall reverse the motion of the doors, providing the lift has not started.

2A.12 Controller: Microprocessor Requirements

1. Enclosures

The control equipment shall be mounted in a sheet steel enclosure, with lockable hinged panels for front access only. The controller shall have a clear space of 150mm to the rear for the unforeseen event that rear access may be required in the future.

2. Cable Entry

All cabling associated with lift control etc. shall be routed through entries in the base of the cabinet.

Any alternative method shall have the same effect but must be approved by the SO.

3. Panel Wiring

Panel wiring shall not support combustion, shall be low smoke emission and shall comply with BS 6231. Positive fixing of cable terminations shall be with purpose made clamps or pinch type terminals or by use of crimped cable tags each with an efficient locking device.

Live terminals connected to 240V or higher shall be adequately shielded to allow for safe live working conditions.

All control relays, contactors and safety circuits shall be 240V a.c. and all car and landing push feeds shall be 100V d.c.

No control circuit voltage operating in conjunction with external controller equipment shall be less than 100V.

4. Micro Computer Protection

The micro computer section of the controller shall be separately enclosed in the control cabinet such that the inadvertent connections of high voltages or physical damage from falling objects is prevented.

All incoming signals shall be via 100V d.c. terminals through filters and opto isolating circuits in the protected area.

5. Coils

All relay and contactor coils shall be continuously rated. Neither telephone type relays nor economy resistors with AC contactor coils shall be used.

6. Thermistor motor protection

Thermistor motor protection and associated controller equipment shall be incorporated in the control panel and shall be fully adjustable to suit the size conditions.

7. Heat Dissipation

Any components which may generate significant quantities of heat shall be external to the controller but enclosed and ventilated.

8. Forced Ventilation

If the controller uses forced ventilation then any inlet vents shall be protected by removable filters with a minimum life of 12 months. Failure of the fan shall not cause overheating of the lift equipment.

9. Micro Section Ventilation

The micro computer section of the controller shall have cooling and if this utilises forced ventilation then any inlet vents shall be protected by removable filters with a minimum life of 12 months. Failure of the fan shall not cause overheating of the lift equipment.

10. Environmental Temperatures

The micro computer section shall be capable of operating in environmental temperatures ranging from +5 to +40 degrees centigrade.

11. Input and Output Isolation and Protection

All input and output lines shall be so protected as to prevent the micro computer controller from being damaged. This means that all printed circuit boards, wiring on the micro computer area, terminating pins, bus lines etc. shall be physically protected from inadvertent connection to high voltages.

All input and output lines must be capable of withstanding short circuits and the application of up to 500v. Such application may result in input and output components e.g. fuses, protection resistors, diodes etc., being damaged and hence the equipment shall be designed to allow their rapid identification, removal and replacement.

All outputs shall incorporate interface relays capable of switching 5 amp at 250V d.c.

All circuit board edge connections shall be plated gold and all input/ output floor plug-in boards shall be interchangeable.

12. Identification

All parts of the equipment shall be adequately identified by permanent labels corresponding to designations on the wiring diagrams, in particular:

1. Terminals
2. Wiring by way of sleeves at all terminations
3. Equipment items
4. Card frame positions

13. Wiring Convention

All wiring shall be identified and identification sleeves, in compliance with the wiring diagrams, shall be provided at cable terminations. All specific computer wiring shall be identified in a different colour or style to the conventional wiring. A list of wiring codes, mnemonics and symbols shall be posted in the machine room.

14. Symbols and Abbreviations

A key to any abbreviations and symbols shall be fixed to the inside of each enclosure.

2A.13 Controller: Instrumentation

1. Indicators

Indicators shall be provided on the controller showing:

1. Car position,
2. Hall calls accepted,
3. Lock status,
4. Car direction up or down,
5. Car "In service",
6. Car door status open, closing, closed, opening,
7. Doors obstructed, doors nudging,
8. Car overloaded,
9. Individual board power supply,

All input and output signals shall have LED indicators,

2. Pushes or Switches

Pushes, switches or other suitable means shall be permanently provided on the controller panels in the machine room to allow:

1. Hall call registration.

LED indication shall be provided for calls registered.

3. External Indicators

Provision shall be made for:

1. Hall call acceptance.
2. Call acceptance and half illuminance of landing pushes.

4. Mechanical Counters

A six figure mechanical, non resettable, digital trip counter shall be provided to record the number of journeys for the lift.

5. Event Recorder

The following shall be recorded in the format of time marker, event type, intervals in days since the last identical event, floor number/other relevant data and number of occurrences. It shall be possible to store a minimum of 24 events.

1. Memory fault/self test result,
2. Programme fault,
3. Switch-on reset sequence,
4. Primary safety circuit failure,
5. Door close protection fault,
6. Door open protection fault,
7. Landing door interlock not made up,
8. Car door interlock not made up,
9. Start failure,
10. Door open failure,
11. Lift stopped outside door zone,
12. Hall call failure (no riser power supply),
13. Car call failure (no power supply),
14. Failure to complete journey in "double time",
15. Transfer timer time out,
16. Car overload,

17. Lift alarm operated,
18. Opening of locks when running,
19. LIS signal true,
20. Shutdown after three successive attempts to start,
- 21-24. Provision for four further event types defined by the SO.

Information on additional faults that may be recorded shall be supplied with the tender documents.

The event recorder shall be capable of examination without affecting the normal lift control function or the continued logging of events.

2A.14 Controller: Duplex Lift Control Logic

1. Controller Function

The control system shall be capable of independently controlling two cars.

2. Type of Control

The control of the lift shall be duplex fully collective with automatic powered door operation.

3. Call Acceptance

All call acceptance indicators shall be driven by the computer and the information path is as follows: call registration push pressed-input to computer programme - recognition and acceptance - output by computer to call acceptance indicator.

4. Hall Call Cancellation

The registered hall call shall be cancelled and the hall call push illumination shall be extinguished before or at the stopping of the lift at floor level.

5. Door Reversal

Door reversal shall be achieved by constant pressure being applied to the car or landing door open push.

6. Parking Floor/Sequence

When idle, one lift shall return to the Ground Floor and remain with the doors closed, whilst the other lift shall remain at the last floor served.

7. Maintenance Control

Car top maintenance control is required on each lift.

8. Firemans Control

Firemans Control is required on each lift.

9. Double Journey Counters

A timer shall be set every time a lift journey is commenced which times out after a duration equal to twice the elapsed time of one full travel journey. The motor shall be switched off and locked out if it continues to run subsequent to the expiry of this elapsed time.

This protection device shall not be operative when the lift is switched to inspection.

10. Adjustment of Timers

Adjustment of all timers shall be possible and their values shall be agreed by the SO.

11. Event Recorder, Supply and Battery Backup

The event recorders shall be provided with a battery back up capable of a minimum of 30 days. This shall be mounted on the printed circuit board.

Alternatively, a limited 8 hour battery back up may be offered on the PCB with an external feed from a battery supply capable of at least 30 days operation.

12. Graceful Degradation

In the event of a malfunction which does not result in the lift becoming "out of service", e.g. landing push supply failure, stuck push, doors jammed at a floor etc the lift shall continue to give a reduced service. The controller shall enter the failure in the event logger and shall continue to serve the building in a degraded fashion, stopping at all floors in an up and down mode.

13. Micro Computer Self Tests

The micro computer shall regularly run diagnostic checks on the memory functions, input and output circuits and run a programme test. Any errors shall be logged in the event recorder.

14. Diagnostic Aids

The controller shall provide diagnostic aids for use in the setting up of the lift to incorporate, but not be limited to:

1. Door times,
2. Call indicator for car and landing,
3. Position and direction indicator.

15. Initialisation

Whenever power is connected to a controller the micro processor shall go through an initialisation routine, clearing all hall call and car call registers and all status registers. Following this zeroing procedure the micro computer shall set all timers to preset default values.

16. Automatic Position Checking

The terminal floors shall be used by the controller to check the correct floor value. Any error found shall automatically cause the lift to travel to the floor level designated for resetting.

17. Stuck Push Protection

The controller shall have the facility to recognise a stuck hall or car push and shall ignore the signal after a pre-determined interval.

18. Programme Examination

The computer programme shall not be accessed, examined or altered within the machine room without the use of special equipment.

19. Overload Indication

Provision shall be made to incorporate a car overload device which shall incorporate a buzzer.

20. Lift "In-Service" Signal

The micro computer will regularly check that the lift is "In Service" and provide an active output signal suitable for connection to a monitoring network. The lift shall be recorded "out of service" should it fail to respond, if the doors fail to close or if the doors are obstructed for a period in excess of 90 seconds even if the lift subsequently continues to be in service.

1. Safety chain broken
2. Alarm operated

21. Interlocks

The door open and door close contactors shall be electrically and mechanically interlocked.

22. Auto Re-start

In the event of a power failure, or whenever the lift is switched off, the controller shall automatically restart on the restoration or re-connection of the power supply and cause the lift to move from its static position.

When the lift encounters a floor with auto position reset, the floor value in the controller shall be reset and normal lift operation shall resume.

2A.15 Controller: Variable Frequency Vector Drive Power System

1. The speed controller shall be mounted within the controller enclosure with all PCBs and terminals easily accessible.
2. The power system shall be variable frequency Vector control, closed loop with feedback from the hoist motor supplied by a quadrature bi-phase pulse tacho generator.
3. The regulator shall be a digital drive system that shall control a low slip, single speed a.c. motor by controlling the currents affecting the motor's torque and flux producing components.
4. The regulator components shall accept 3 phase a.c. power, and provide rectified, then inverted, 3 phase a.c. power output controlled by a signal/torque/flux processing section.
5. Braking shall be achieved by absorption of the lift kinetic energy via the d.c. bus with surplus energy being absorbed by the use of dynamic braking resistors switched by use of a dynamic braking module. The lift shall reduce to zero speed at floor level to give an electrical stop.
6. The regulator shall incorporate a monitor parameter unit to allow values of output current, output frequency, slip frequency, d.c. link voltage, motor speed and torque demand to be monitored in real time. The monitor shall have the facility to access the regulator fault codes to allow on site fault finding.
7. The thyristor bridge shall be adequately rated for maximum current with a PIV not less than 1200V.
8. Floor level accuracy shall be consistent at no load or full load to +/- 6mm.
9. Complete circuit diagrams of drive shall be incorporated in both the machine room schematics and manuals.
10. The slow down of the lift at terminal floors shall be achieved by electronic means.
11. The switching of power by contactor to the hoist motor shall be commutated with the thyristor turn on and turn off.
12. Safety guidelines shall be to the British Standard for VF controllers. Where the power electronics are located on printed circuit cards the removal of any card or charts shall apply the brake if the lift is moving or shall prevent the lift from starting a journey. Use of error tracking during a journey to shut down the lift to a fail-safe condition is acceptable.
13. Re-levelling shall be incorporated.

14. Inspection speed to be 0.4m per second and shall be capable of moving the lift throughout travel on a continuous up and down basis for not less than 30 minutes.
15. The motor of any pressure fan shall be started on motor over-temperature.
16. All relay and contactor coils shall be continuously rated. Neither telephone type relays nor economy resistors with AC contactor coils shall be used.
17. The brake switch incorporated in the winding machine shall cause the pickup current of the brake to be reduced to half value, by inserting an appropriate resistor. The natural response time of the brake shall be decreased by placing a resistor in series with the brake coil, which shall be wound for 100 VDC.

2A.16 Controller: Door Operator

The door operator control circuits shall operate the doors in direct response to the selected car and hall calls and shall provide for the following features:

1. Provision to operate the AC variable frequency door motor from the car top maintenance control at any position in the shaft.
2. The inclusion of circuits to connect to a positively operated switch that shall make up only when the door operator is in the fully closed position. The switch shall be incorporated into the car and landing door lock circuits.
3. If the car or landing door contact fails to make up within 10 seconds after the door close cycle initiation, then a door open cycle shall commence, whether the lift is committed to a journey or not.
4. Operation of the door close protection timer shall cause all car and hall calls to be cancelled.
5. Normal lift service shall be restored when a hall call is registered, thus immediately initiating a door close cycle.
6. Operation of the door detector shall initiate a door open cycle.
7. A door open push shall be provided to provide door reversal.
8. Failure of the lift to start its journey due to the doors being held shall cause the hall call to be cancelled after 40 seconds elapsed time.
9. The door operator logic circuits shall be so arranged that operation is not dependent upon a single or secondary circuit element. Failure of such elements shall not cause the doors to remain in the open condition.
10. Care shall be taken to ensure that all wiring and terminal block positioning associated with the lock circuits and safeties to and from the door operator is such that no possibility of short circuits due to fracture of terminals, moisture, etc., can take place.

2A.17 Rubber Insulating Mats in Machine Room

The Contractor shall provide permanently secured rubber insulating mats to the front of the controller and all switchgear.

The mats shall be full width of the relevant equipment and at least 900mm in depth with each mat rated to insulate against 11kV as a minimum each mat clearly displaying a certifying notice.

Where one side of the rubber mat is fluted or profiled, this shall be laid against the floor where the mat shall be retained within a non-conducting periphery trim should the fitting of the mat potentially create a tripping hazard.

2A.18 Lift Machine: Electric Traction

1. Winding Gear Unit

The whole of the winding gear unit including the motor, worm reduction gear, traction sheave, brake and pedestal bearings shall be mounted on continuous bed plate of cast iron or steel construction to form a completely self contained unit.

Should any part of the winding gear unit require dismantling for delivery purposes, reassembly shall be carried out by the manufacturer or his nominated specialist company, not the Contractor.

The design and position of the unit within the machine room shall be such that expendable items within the unit can be replaced without having to move the gear.

The gear shall be rated for 240 starts per hour.

2. Worm Reduction Gear

The winding gear shall be of the worm-reduction type consisting of a steel worm cut from high tensile forged steel, solid meshing with a worm-wheel consisting of a centrifugally cast phosphor bronze rim, shrunk on and securely fitted to the machined cast iron centre hub. Both worm and worm-wheel shall be accurately cut to ensure smooth running and shall have adequate shearing and torque qualities.

The reduction gear shall be contained in a non-porous, cast iron, oil-tight case, with all bearing surfaces automatically lubricated from the oil bath.

A visual oil gauge shall be provided. The oil temperature rise shall under no circumstances exceed 40°C and a label shall be affixed to the gear case to indicate the manufacture, type and quantity of oil used.

All bearings shall be of the renewable sleeve ball or taper roller pattern except when overhung pulleys are employed, in which case roller bearings shall be provided.

The centre distance of the worm gear shall not be less than 37.5% of the effective diameter of the traction sheave.

3. Traction Sheave - general

The traction sheave shall be of the vee-type manufactured from cast iron with 210-250 Brinell hardness and shall be accurately turned and grooved to grip the steel wire suspension ropes. The rim shall be bolted to a flange on the sheave so that the rim may be readily replaced.

The traction sheave diameter shall not be greater than 1.5 times the diameter of the worm-wheel with the minimum effective diameter of the traction sheave not less than 47 times the diameter of the rope it supports.

An outboard bearing shall be provided for the traction sheave which shall be lubricated automatically from an oil bath.

4. Diverter Sheave

The diverter sheave shall have a minimum diameter of 550mm and shall be installed in the machine room to divert the ropes to suit the application.

The sheave shall be manufactured from cast iron with 210-250 Brinell hardness and the minimum effective diameter of the wheels shall not be less than 40 times the diameter of the rope it supports.

Ball or roller bearings shall be used on all sheaves.

5. Brake

The lift machine shall be fitted with a self centring electro-mechanical brake, so arranged to be applied automatically on supply failure and to be capable of bringing the lift to rest under conditions of maximum load and then holding the lift firmly in that position.

The brake shall comprise two cast iron arms, lined with asbestos free brake shoes, that shall act upon the coupling between the motor and worm reduction shaft and which shall be applied by means of a spring in compression. Provision shall be made for adjustments of the brake and ease of removal of the arms for renewal of the brake linings.

The brake shall be released by a direct current operated solenoid and resistors shall be wired in parallel with the coil to smooth the operation.

2A.19 Hoisting Motor: Variable Frequency Vector Drive

1. The hoist motor shall be single speed, 4 or 6 pole, with characteristics of high pull out torque and low slip NEMA B or D type. It shall be dynamically balanced and quiet running and the minimum duty rating shall be 240 starts per hour.

2. If a pressure fan is provided, failure of the fan shall not allow damage to the motor windings due to excessive heat build-up.
3. Thermistors shall be embedded in the stator windings to give protection against overheating.
4. The hoisting motor shall be fully compatible with the specification of the regulator manufacturer, be insulated to Class F, be of drip proof construction and shall bear name and data plate of the maker.
5. The maximum values of start and run current shall be provided with the tender return and, if requested, Tenderers shall provide the design calculations to support their figures.
6. Test certificates for 'complete' tests as set out in BS 5000, Part 99, and BS 4999 (incorporating additional tests for hoisting motor starting torque as a percentage of the full load torque) shall be submitted prior to delivery of the motor to site.

Note: Compliance of the machine and motor with tests of the maker shall not relieve the Contractor from the responsibility of providing a machine capable of performing under all normal working conditions and satisfying the additional tests as set out in this specification.

2A.20 Winding Gear Unit Raft

The winding gear unit raft shall be mounted on rolled steel joists that shall be supported by an independent rolled steel joist assembly, the whole assembly supported by means of the existing concrete plinth and walls. The joists shall be of sufficient length such that bearing in the flank wall of the shaft is achieved.

All steels utilized for the raft assembly shall be a minimum of 203mm x 203mm section weighing 46Kg / m².

2A.21 Isolation

The completed lift installation shall be designed to ensure quiet operation and sound isolation shall be provided to reduce the transmission of any noise or vibration to the building fabric and structure.

Machine isolation shall be positioned between the winding gear unit raft and the support steelwork.

2A.22 Emergency Hand Winding Operation

The machine shall be provided with a hand winding wheel which shall be smooth rimmed, spokeless and of lightweight construction. If it is removable, it must be an accurate fit on the shaft and, when removed, the motor shall be fitted with a shroud.

2A.23 Hand Operation Floor Zone Indicator

Provision shall be made in the machine room for indicating the position of the lift car with respect to each landing when hand-winding is being undertaken by authorised personnel. This shall only be operative when the power supply is switched off and the lock circuit shall not be used to provide the feature.

The Contractor shall provide an automatic and self-contained charger unit to supply both the handwinding position indicator and the buzzer assembly which, in the event of supply failure, shall be maintained by the unit for a minimum of three hours.

The position indicator and buzzer shall operate when the car floor is no more than 25mm from the landing level. The unit shall be clearly visible and audible from the machine and shall be operated by a switch mounted on the front of the controller enclosure.

Durable, clear and precise instructions, encapsulated in plastic, on the use of the above together with the emergency release procedure shall be fixed on the wall adjacent to the machine and to the controller.

2A.24 Auxiliary Stop Switch

The switch shall be of the metal clad, double-pole, bi-stable two way type, totally enclosed and readily accessible adjacent to the machine. When the switch is thrown to the 'STOP' position it shall cause the lift to stop and prevent the lift being started until the switch is returned to the 'RUN' position.

2A.25 Overspeed Governor: Bi-directional

The overspeed governor shall be sealed for the respective tripping speed specified and shall incorporate a test groove to provide means for random checks to prove the governor operating speed.

The governor shall be fitted with electrical contacts which shall open the motor and brake circuits in the event of overspeeding in either direction. A further increase in speed in either direction shall mechanically trip the governor and cause the safety gear to operate.

The breakage or slackening of the governor rope shall cause the motor to stop and the brake to be applied by means of an electric safety device.

If not totally enclosed the governor shall be fitted with a guard that shall have a duplicate dataplate fitted to the uppermost section of the guard.

The governor tension weight shall be secured to the lift pit such that it shall withstand the force imposed when the safety gear operates in the up direction under no load conditions at the mechanical tripping speed of the overspeed governor. The governor tension weight shall be fitted with a rope guard.

2A.26 Guides and Guide Brackets

The Contractor shall ensure that the cross section of the 'T' section guide rails and the rail bracket spacing are calculated for the size and weight of the lift car plus load. A copy of the calculations shall be submitted to the SO for comment within three weeks of contract award.

One set of car guides plus the counterweight guides shall be re-located to suit the new condition.

The Contractor shall plumb and mark out the shaft to suit the fixings required for the guide brackets generally in accordance with the drawing L2508/01 and in so doing shall provide all bracket fixing anchorages.

Where guide bracket fixing anchorages are to the masonry fabric of the building chemical fixings shall be used

The Contractor shall plumb and bone the guides to ensure that they are vertically aligned, and shall advise the preferred method with the tender return. Once all plumbing and boning has been completed, any bracket fixing studs shall be cut off to provide a thread protrusion of not more than 10mm, dressed to eliminate sharp edges.

Tram lining is not acceptable and the Contractor shall leave the boning lines in place for witness inspection by the SO.

The guides shall be secured to channel steels in the lift pit and all guides, sole plates and fixings shall withstand the force imposed when the safety gear operates under full contract load.

2A.27 Roller Guide Shoes Assemblies

The assemblies shall be designed such that in the event of spring, bearing or tyre failure a keeper plate shall ensure that the car or counterweight shall be retained within the guide rails.

The top of the car roller guide shoes shall have a protective cover of such design that it will adequately support the weight of 100kg at any point without causing permanent deformation or damage. The area shall be flat, smooth and without tripping hazards.

Adjustments shall be made by means of slotted apertures in the mounting assembly and by means of adjustable spring pressure to the rollers which shall have a minimum diameter of 150mm to the car and 80mm to the counterweight.

2A.28 Buffers

The car and counterweight shall have energy dissipation buffers.

An electric switch shall be fitted to stop lift service on compression of the buffers and the switch require a manual reset following compression and return of the buffer to the normal position.

2A.29 Pit Ladder

A galvanised, flat tread, mild steel ladder with handholds shall be provided to give ease of access to the lift pit in a position and to a design to be agreed with the SO.

2A.30 Pit Stop Switch and Shaft Access

The two pit switches shall be of the metal clad, double-pole, bi-stable two way type, totally enclosed and positioned away from the lift car. When a switch is thrown to the 'STOP' position it shall cause the lift to stop and prevent the lift being started until returned to the 'RUN' position.

One switch shall be readily accessible from the lowest level served at 1.3m above the landing and a maximum of 1.0m from the landing entrance and the other shall be 1.0m above the pit floor.

2A.31 Limit Switches

The terminal, slowing, stopping and final limit switches shall be complete with all necessary fabricated brackets which shall be pinned after final positioning.

2A.32 Counterweight

The counterweight frame shall be fabricated from rolled steel sections and shall be of bolted construction, having cast iron filler weights of uniform size, but not exceeding 200mm width.

The weights shall be secured to the frame by tie rods with a retaining 'U' bracket bolted between and through the upright channel sections.

At mid point in the shaft the suspended weight of the counterweight shall equal the suspended weight of the car plus 45%-50% of the contract load.

2A.33 Counterweight Screen

A counterweight screen shall be provided in the lift pit. The screen shall be fabricated from heavy gauge, galvanised, 25mm square, mesh wirework in a mild steel rod frame. The screen shall be easily removable and shall extend the full width of the counterweight from 150mm above the pit floor to a height of 2.2m.

2A.34 Car Sling and Platform

The car sling and platform shall be fabricated from rolled steel channel uprights and cross sections and shall be so reinforced and braced as to sustain a fully loaded car without permanent deformation during normal operating conditions, operation of the safety gear or in the event of impact with the buffers.

The roller guide shoes shall be mounted on plates secured to the horizontal sling members and steel buffer plates shall be mounted on the underside of the sling. The platform and car enclosure shall be fully isolated from the sling by means of rubber mountings with restraints.

2A.35 Car Sub-Floor

The sub-floor shall be cut from a single piece of flame retardant Marine Ply to BS 1066 requirements and shall have a minimum depth of 25mm and be secured to the structural platform members. A 16 gauge zintec steel sheet shall be fixed to the underside of the sub-floor.

The floor shall be so constructed as to withstand deformation under normal operating conditions or on operation of the safety gear and in the event of impact with the buffers, fracturing or loosening of the applied car flooring shall not occur.

2A.36 Safety Gear - Bi-directional

A progressive wedge type safety gear shall be provided, fixed to the bottom members of the car sling and designed as to arrest the car should an overspeed condition occur in either direction. The safety gear shall be operated by an independent steel wire governor rope and shall be fitted with an electric switch to cease power to the motor and apply the brake in the event of operation. The switch shall require a manual reset to return the lift to service.

2A.37 Crown Bar Records

The Contractor shall provide and fix an engraved 10 swg brass notice, flush filled with white epoxy resin, to the crown bar of the car sling. Numerical detail shall be metric and the label shall detail the following information:-

1. Makers Name and Lift Number
2. Client Identification and/or Number
3. Total Car and Sling Weight
4. Contract Load and Speed
5. Rope Diameter, Length and Lay

2A.38 Car Top Maintenance Control Station

The control station on top of the car shall meet the requirements of BS 7255, shall have the faceplate facing the front of the car and shall incorporate the following features:-

1. A 240 volt, 9 watt, compact fluorescent low energy lamp, that shall be protected against impact by a screw fixed polycarbonate cover, and controlled by a separate switch. The unit shall incorporate emergency lighting.
2. A switched 13 amp socket outlet to BS 1363 incorporating a residual current tripping device of 30 milliamps.

Items 1. and 2. shall have a common supply.

3. A metal clad bi-stable stop switch and with this switch in the stop position it shall not be possible to move the car from any control position. The stop switch shall be readily accessible from the landing when the car roof is positioned 1 metre above the landing threshold.
4. An "UP" and "DOWN" and a common constant pressure push, clearly marked, this push being sited between and adjacent to the "UP" and the "DOWN" push. The circuitry shall be arranged such that two pushes must be pressed in order for the car to move in either direction.
5. A robust TEST SWITCH, with the "TEST" and "NORMAL" positions clearly engraved.

With the switch in the "NORMAL" position, the lift shall respond to landing and car calls. With the switch in the "TEST" position, the "UP" and "DOWN" and common constant pressure pushes on the car top control station shall become operative, subject to the following conditions:-

1. It shall not then be possible to control the car from any other position.
 2. The car shall travel at a speed not exceeding 0.4m p.s.
 3. The car shall not move until all safety devices are made and remain in the safe position.
 4. The car shall move only while the respective direction and common push are both depressed.
 5. A terminal limit switch, associated with this control, shall, when the car is moving upwards, stop the car so that there is a free distance above the maintenance platform area of at least 1.8 m. A white paxoline notice shall be screw fixed to the cover of the limit engraved with the words "MAINTENANCE LIMIT" in red lettering.
 6. A door operating switch which shall have its "DOOR OPEN" and "DOOR CLOSE" positions clearly engraved. This switch shall operate the selected doors but only while the car is stationary with the TEST SWITCH in the "TEST" position.
6. The control station shall be so positioned and designed that it does not inhibit safe use and to prevent accidental operation.

2A.39 Car Top and Car Bottom Clearance

Where the pit depth is less than that required to provide the 600mm clearance required by BS 5655, then the bottom run-by of the car when at floor level shall be reduced to 150mm in order to maximise the car bottom clearance.

If the configuration of the machine slab and support steels does not satisfy the requirements for car top clearance required by BS 5655, then a warning notice stating "REDUCED HEADROOM" shall be provided.

2A.40 Suspension Ropes

A minimum of four suspension ropes shall be used, to be not less than 13mm diameter, and a certificate of Test and Examination, as required by Statutory Legislation for ropes used in the United Kingdom, shall be forwarded to the SO.

The roping arrangement shall be 1:1 and all ropes shall be delivered to site on individual reels.

2A.41 Rope Terminations and Anchorages

All ropes shall be anchored to the counterweight and car frame by means of eye bolts and bulldog grips on multi point anchorage plates, secured to the underside of the car and counterweight crosshead assemblies. No less than 4 bulldog grips per termination shall be used and the rope tails shall be 500mm long and tied back to the standing part of the rope.

Wedge sockets may be used as an alternative should space requirements be limited.

Rope retainers fabricated with solid steel bars shall be provided for the traction sheaves.

During the life of the ropes it shall be possible to raise the counterweight by 150mm, by means of adjusting nuts on the counterweight eyebolts or sockets. The eyebolts or sockets shall have spring tensioning on the counterweight and a locking device at both ends to prevent the eyebolts from turning.

2A.42 Rope Stretch and Clearances

The clearance between the counterweight and buffer shall be sufficient to allow for 230mm of rope stretch, or as much as is practicable where space in the well is restricted, before it becomes necessary to adjust the ropes to ensure that the top limit switch shall have its contacts opened before the counterweight touches the buffer. The use of removable stools or packing under the counterweight or buffer is not acceptable.

The Contractor shall allow for one shortening-up of the ropes during the warranty period, the timing of which shall be notified 5 days in advance to the SO.

2A.43 Compensation

Compensation shall comprise a low carbon electrically welded proof coil chain, each link proof tested at twice the working load limit. The chain shall be encapsulated within 60° flame retardant polyvinyl chloride material.

The compensation cable shall be supported beneath the car by means of a safety u-bolt and Kellem grip, together with a safety loop and support bracket.

Damping devices shall be provided at low level approximately 1m above the bottom of the loop.

2A.44 Lift Car: Floor Covering

The floor covering shall be 6mm tactile non slip sheet having a continuous 35mm radius return on a solid core to the car skirting.

2A.45 Lift Car: Sill

The car sill shall be 4mm minimum section extruded manganese bronze, having self cleaning slots and shall be secured by brass countersunk set screws with self-locking nuts. The sill and the rolled steel sill support angle shall cover the full width of the door drive so that each set of door shoes are retained throughout the driven distances. Over the car entrance width, the horizontal distance between the car sill and each landing sill shall be no more than 30mm.

2A.46 Lift Car: Toe Guard

The height of the vertical portion shall be as near as possible to 750mm, subject to the requirement that there shall not be less than 100mm clearance between the bottom of the toe guard and the pit floor when the car rests on fully compressed buffers.

The toe guard shall be fabricated in 1.6mm zintec, supported by a horizontally and vertically braced mild steel frame attached to the car platform steelwork, and fixed at no more than 150mm centres to the car sill by countersunk brass set screws.

The toe guard shall extend to 100mm beyond the clear door width on both sides of the entrance.

2A.47 Lift Car: Enclosure

The Contractor shall provide a 600mm x 1200mm montage having two isometric views of the lift car, complete with all finishes for consideration by the residents.

Stainless Steel

The car walls, ceiling and front return panels plus the car and landing doors and architraves shall be fabricated in 16 gauge, 316 grade patterned stainless steel for which the Contractor shall provide a mill certificate to the SO, prior to any fabrication.

Fixings

All nuts, bolts and washers to be used in the construction of the car carcass, platform and sub-floor shall be cadmium-plated and nuts shall be of the self-locking type.

Fixings, of any type, shall not be visible from the car or landings.

Evode Colour Seal shall be applied to form a separation barrier at the abutment of any dissimilar materials, and 3mm of fire resistant, anti-drumming compound shall be used on the shaft side of all wall and ceiling panels.

Wall Panels

The car wall panels shall be fabricated from patterned stainless steel not more than 250mm in width and shall be sufficiently braced and reinforced to withstand anticipated impact from heavy usage such as furniture removals, prams and trolleys.

All mating surfaces shall be treated with mastic.

The bottom edge of the car wall panels shall be positioned 75mm above the car sub-floor and shall be bolted through a 16 gauge stainless steel angle trim 9mm in front of the skirting. The whole shall present a continuous flush face to the passenger with each panel fabricated in one piece vertically.

The joints between each of the car wall panels and each of the roof panels shall be separated by recessed 3mm Darvic strips which shall in all instances be prevented from being forcibly pushed into the shaft by a return flange on all wall and ceiling panels.

The design of the car shall allow simple removal and replacement of the panels in the event of damage.

Return

The return shall be 60mm deep and fabricated from patterned stainless steel, reinforced throughout with 14 gauge zintec sheet steel.

Slam Post

The entrance slam post shall be fabricated from stainless steel, reinforced with 14 gauge zintec sheet steel throughout, with all loads imposed transmitted to the steel car door entrance frame.

Skirting

The channel skirting shall be 316 grade, 3mm minimum satin finished stainless steel with welded gussets and shall have the bottom flange bolted to the car platform using a plastic membrane between to prevent electrolytic corrosion and chafing.

Handrail

Handrails shall be fabricated from 12 gauge, 316 grade satin finish stainless steel and formed to a 47mm x 25mm oval section with the widest part on the horizontal. The handrails shall fit the rear wall and one side wall of the lift car in one piece with end caps and 90° bend and end cap at the lift entrance.

The free space between the handrails and the car walls shall be 35mm.

The handrails shall be fixed with a minimum of six 90° stainless steel angle brackets, three to the side wall and three to the rear wall, and removal shall be from the lift shaft with fixings 900mm +25/-25mm to centre above the car floor.

Ceiling and Roof

The car ceiling shall be constructed from patterned stainless steel panels not more than 250mm in width and shall be reinforced externally with 14 gauge sheet zintec treated with a non-slip compound.

The design of the roof shall be such that it will adequately support the weight of 150Kg at any point on the roof surface without causing permanent deformation or damage. The working area shall be flat, smooth and without tripping hazards.

Ventilation

Concealed ventilation shall be provided to the car at the top and bottom of the side wall panels. The ventilation shall consist of 10mm diameter clear apertures totalling 1.5% of the total car floor area with robust masking plates to the shaft side of the car. The design of the vents shall be such that it shall not be possible for persons travelling in the car to touch any fixed or moving equipment in the lift shaft by means of inserting objects through the vents.

Car Drapes

The car shall be fitted with solid stainless steel capstan studs and supplied with two sets of padded and quilted, coloured canvas covered drapes to each wall and the return of each design of the lift car. The drapes shall have apertures for access to the car stations and a labelled carrying bag shall be provided for the drapes. A sprung rod with rubber end buffers shall be provided to support the drape at the mirror wall.

Plumbing and Alignment

Adjustments to the car shall be made by packing to the base and not by taking up tolerance on the car top isolation rollers which shall be fitted only after the plumbing and levelling of the completed car and inspection by the SO.

2A.48 Lift Car: Station

The faceplate shall be fabricated from 3mm finished stainless steel fitting flush to the wall panel and supported by stand-off furniture hinges on a metal back box mounted in the side wall, adjacent to the slam post.

The minimum lateral distance to the centre of any push from the return shall be 400mm

The hinged faceplate shall have secret fixings and shall incorporate the car station fixtures. The Contractor shall submit a drawing, for approval by the SO, indicating the incorporation, size and arrangement of the following:

1. TMO Lift Number and Identification - engraved characters, black, 20mm characters.
2. Contract Load in Kgs and Persons - engraved characters, black.
3. Auto Dialling Telephone Unit - engraved instruction, yellow.

4. Floor Pushes.
5. Speech Synthesiser.
6. Car Position and Direction Indicator.
7. Door Open Push.
8. Alarm Push, engraved characters, yellow.
9. Key Operated Fan Switch, engraved characters, black.
10. No Smoking Notice - engraved characters, red.
11. Car Preference Key Switch, engraved characters, black.
12. Emergency Lighting Test Switch with LED indication.

Unless specified otherwise, all engraved characters shall be 12mm and flush filled with epoxy resin.

The flat form trailing cables shall run continually from the controller to the car and shall be connected to terminal blocks permanently mounted in the metal back box behind the car station.

The car station fixtures shall be secured by weld studs to the faceplate to enable simple access and replacement of components by authorised personnel.

2A.49 Lift Car: Auxiliary Car Station

A canted, auxiliary stainless steel car station, incorporating the full range of the car pushes, shall be provided within the car wall diagonally opposite the car station to the same design and fixing as the car station.

2A.50 Lift Car: Pushes

All pushes shall meet the requirements of EN81-70 and M2/S2 Building Regulations and shall:

1. Be stainless steel tactile coloured black for the floor and door open pushes, yellow for the alarm push and green for the Ground floor push.
2. Be flush mounted except for the Ground floor push that shall stand proud of the faceplate by 5mm.
3. Incorporate long life LED call acceptance.
4. Be half illuminance at all times with full illuminance to indicate call registered.
5. Remain half illuminance in the event of power failure.

6. Have an audible signal to signify that a call has been registered.
7. Be flame resistant.
8. Have shock loads on the pressel transmitted to the body of the unit and not the contacts.
9. Be of such design as to make the deliberate 'fixing' of the pressels in the depressed position difficult.
10. Have no fixing visible or accessible from the landings or the lift cars.
11. Have the lowest push to the car station positioned at 900mm centre and the highest push at no more than 1200mm centre above the car floor.

2A.51 Lift Car: Load Sensing Device

A load sensing device shall be fitted to the car sling or platform that shall automatically detect a pre-set overload limit of 10% and shall cause a buzzer to sound within the car.

At 80% load, or as determined during commissioning, the device shall activate a landing call by-pass condition causing the lift to respond only to car calls.

The device may be mounted either underneath or on top of the car, but if the latter, the device shall be suitably protected.

2A.52 Lift Car: Alarm Sounder

The alarm sounder system shall be run in conduit or trunking, except for in the travelling cables, and shall consist of 2 x 150mm bells that shall be suitable for a twelve volt d.c. supply.

One bell shall be positioned on top of the lift car and the other shall be housed within a 10 gauge 316 grade stainless steel box fixed to shaft front wall at the Ground floor by means of concealed masonry fixings. The faceplate shall be partially perforated and fixed by means of semi secret fixings to the back box. Pressure on the 'Alarm' push shall ring each of the bells.

2A.53 Lift Car: Voice Synthesiser

The voice synthesiser shall be digital quality and provide for the following messages, each of which shall be easily disabled from the machine room without the requirement to reprogram the unit:-

1. Floor identification,
2. Direction of travel,
3. Doors opening,

4. Doors closing,
5. Lift overloaded,
6. Information for trapped passengers,
7. Lift on Firemans Control.

The unit is to be located in the machine room and shall supply a matched high quality speaker unit in the car station with a switched duplicate speaker which shall be provided in the machine room for testing purposes. Volume adjustment is required to adjust for site conditions.

2A.54 Lift Car: Hands Free Auto Dialling System

Pressure on the 'Alarm' push shall also instantaneously activate the hands free auto dialling system that shall be capable of dialling a minimum of three separate locations, automatically progressing to the next number if engaged or unobtainable.

The unit shall have the facility to receive calls and shall incorporate an inductive loop and have the further facility to cancel on operation of the door open push and after a preset time interval. The autodialling system shall incorporate communications from the lift pit, car top and machine room.

A yellow illuminated pictogram in addition to the audible signal for the emergency alarm transmission shall indicate that the alarm push has been used and a green illuminated pictogram in addition to the audible signal normally required by voice link shall indicate that the emergency call / alarm has been registered.

On activation, the autodialler shall announce a concise message, whether within the lift car, in the lift pit or on the car roof. The message shall confirm that the emergency communication system has been operated, that contact is being made and a request to be patient whilst being connected. The message shall repeat after a short period until the call is acknowledged.

On connection, the recipient of an emergency call from the autodialler shall also receive a concise message, confirming the lift number or reference and that the emergency alarm has been activated.

An emergency call shall be terminated by the call automatically timing out. The duration of an emergency call shall be set at 4 minutes but this may be extended if required by pressing the alarm push again. The last 30 seconds of a call shall be identified so that the call may be extended without loss of the facility.

Two-way communication with the activated alarm station whether in the lift car, pit, or car top shall commence only after the call has been acknowledged.

The system shall allow for the lift car, pit or car top emergency communication station to be called from any external mobile or landline telephone point but such calls shall not be connected if the emergency autodialling system is in operation. The destination for calls made externally shall be determined from the caller's handset, and these calls shall be announced by a concise message, prior to allowing hands free, two-way communication from the lift or shaft.

The cabling shall be terminated in the machine room for final connection by others.

Clear, concise instructions shall be engraved in the car station in 12mm characters, flush filled with epoxy resin.

2A.55 Car Intercom and CCTV Equipment

The existing CCTV camera and intercom equipment in the lift car shall be dismantled, stored, re-installed and commissioned, by Royal Borough of Kensington & Chelsea term contractor, Eversafe, contact Mr A Bailey on 01702 511101.

The equipment shall be housed in replacement stainless steel corner sections similar to that installed at present and faceplates shall be secured by means of semi secret fixings.

2A.56 Lift Car: Lighting

1. The lift car shall have two vandal resistant light fitting enclosures which shall be approximately 700mm long and 250mm wide.
2. The light fitting enclosures shall be manufactured from mild steel, have ventilation slots to the sides and shall be reinforced and braced to withstand a load of 75kg with the whole assembly which shall be supported on the car roof by means of mild steel angle to all four sides.
3. The interior of the enclosures shall be cellulosed white and the whole assembly shall mount flush on the car ceiling.
4. The diffusers shall consist of two layers of shock and impact resistant polycarbonate sheet, the upper layer 3mm opal and the lower layer 10mm clear. The diffuser shall be secured on each side by means of mild steel angle affixed to the enclosure, all to be contained within 1 2.5mm stainless steel frame.
5. In the light fitting enclosures the gap between the bottom of the lamps and the uppermost part of the diffuser shall be nominally 25mm. The complete enclosure assembly shall be made readily removable from the top of the car to ensure ease of access for maintenance of the fittings. To facilitate this, the enclosure shall be secured to the car top by wing nut fixings of 5mm minimum diameter or other similar arrangements.
6. Each enclosure shall contain two 18 Watt x 600mm fluorescent tube fittings each separately controlled to maintain illumination in the event of one fitting ceasing to operate. The lighting shall achieve 200 lux at floor level. One tube in each of the enclosures shall incorporate the emergency lighting system.

7. A key switch shall be incorporated in the car station in order that the emergency car lights may be tested without disconnecting the normal lighting supply. The LED indicator in the car station shall visibly signify that the emergency lighting unit is fully charged.
8. The car light supply shall be separate from the car top lighting and power and a 2 Amp cartridge fuse and terminal block shall be fitted within the enclosure.

2A.57 Lift Car: Emergency Lighting and Alarm Supply

The battery and charging unit for the car emergency lighting shall be fixed on top of the lift car, in a position that does not create a safety hazard and with the wiring run in trunking and/or conduit.

The battery shall power the car emergency lighting and the alarm signal system and shall have the capacity to maintain each for a period of at least 3 hours and, on restoration of the mains supply, the battery shall fully re-charge, automatically, within 24 hours.

The battery shall additionally power the background illumination to all lift car pushes and all position indicators for the same 3 hour period.

The battery shall be fed from the live side of the car light switch in the machine room.

The supply to the luminaires shall be provided via a key operated switch which, on operation, shall disconnect the supply, simulating mains failure for testing purposes.

2A.58 Lift Car: Forced Ventilation

Forced ventilation shall be achieved by means of a protected, silent running exhaust fan unit mounted on the car roof. Ducting shall be provided to encompass a number of the concealed vents in the rear wall of the car. The position of the fan unit shall be agreed by the SO.

The fan shall be activated by a key switch in the car station which, when in the 'OFF' position shall automatically become operable upon activation of the alarm push for an adjustable time period of up to three hours.

2A.59 Automatic Power Door Operator

The automatic door operator shall meet the following:-

1. It shall be driven by a variable frequency AC motor in both opening and closing directions. The motor shall be totally enclosed and rated for its anticipated duty cycle.
2. The door speed during operation, shall have sinusoidal characteristics.
3. When the car top control is set to test with the car not at landing position it shall be possible to test, from the car top control station, the functioning of the door

operator without operation of any other lift equipment and without damage to any equipment.

4. With the exception of 3. above, the car door and associated landing doors shall operate simultaneously and only with the car stationary at a landing.
5. In the event of a power failure and with the car at any landing level, it shall be possible to manually open both the car door and associated landing door, from the landing concerned, with the use of a release key.
6. The operator shall incorporate provision for simple adjustment of door speeds and shall provide the following:
 1. Fast opening speed
 2. Slow closing speed with a check prior to impact.
7. It shall effect mechanical locking of the car door between floor zones.
8. In the event of failure of the lock circuit while the car is in travel, the car door shall not be opened or partially opened by the door operator or by any other means.
9. The lift shall normally park with its doors closed.
10. It shall stop, reverse and fully re-open the car door and its associated landing door if the electronic detector is obstructed while the doors are closing.
11. A 'DOOR OPEN' push shall be provided in the car which shall only operate while the car is stationary at a landing.

2A.60 Passenger Protection

The car doors shall be fitted with a full height multi-beam electronic detector. The detector shall be so arranged that should an obstruction be present whilst the door is closing it shall cause both car and landing doors to stop and initiate a door re-open cycle. The device shall not inhibit the full clear opening.

The detector flex shall be concealed and secured so as to prevent movement against other equipment and in the event of circuit or other failure for whatever reason the lift shall fail safe.

2A.61 Car and Landing Doors

The car and landing doors shall be horizontally sliding having a minimum clear opening as stated in Scope of the Works and the doors shall:

1. Have the car and landing doors fabricated from a different patterned stainless steel to that utilised on the lift car and landing architraves to ensure an alternative textured finish.

2. Be located in the bottom of each door sill by two water and acid resistant, rigid nylon sliding shoes each having a minimum length of 100mm and secured to the well side of the door by a 2.5mm mild steel bracket with three non adjustable fixings such that the shoes may be replaced easily, without lifting the door.
3. Between each sliding shoe a similar flange with five non adjustable fixings shall support a 150mm long 10 gauge mild steel kick plate that shall penetrate the bottom track by not less than 6mm.

Alternatively, the kick plate may form part of the structural component of the door, projecting internally 100mm.

4. Have the vertical clearance between the doors and the sill not exceeding 5mm.
5. Have the horizontal clearance between the doors, door return and architrave not exceeding 5mm.
6. Be suspended from hangers fitted with rollers which run above the top track and have eccentric rollers fitted below the top tracks to stabilise the doors. The rollers shall rotate on roller bearings or similar with 'sealed for life' lubrication.
7. Have hangers and sill shoes that shall be supported by an 8mm thick steel plate fixed at the head and foot of the door. Door hanger fixings shall have a minimum of 15mm thread penetration and a maximum of 5mm shimming.
8. Be fabricated in 16 swg zintec sheet steel, being of hollow construction with internal stiffening sections and faced with patterned stainless steel.
9. Have 16swg patterned stainless steel sight guards to the landing doors, formed in one piece with the landing face of the door and braced over the entire height, returning to the shaft side of the door and pinned with a maximum spacing of 100mm.
10. Have the fixing of associated door equipment to the car and landing doors by means of set screws and bolts with the appropriate shake-proof washers to steel plates specifically fabricated within or on the door construction for the purpose. P.K., Pop rivet or riv-nuts are not acceptable.
11. Be provided with spring closers to ensure automatic closing of each landing door panel when the car is outside the unlocking zone. The closer shall consist of a substantial mild steel arm fixed to the landing sill and shall have a positive spring loaded action.
12. Have a mechanical and electrical interlock to each landing door panel. The locks shall have a clear, toughened, removable plastic cover, sealed to prevent possible ingress of water whilst allowing visible and easy adjustment without the use of special equipment.
13. Have the mechanical and electrical interlock of such design and positioning that interference of the lock or its operation shall not be possible other than by an authorised person.

14. Have the mechanical and electrical interlock pinned after final positioning.
15. Have no fixings visible or accessible from the landings or within the car.
16. Have the landing doors so constructed that when in the locked position, they shall withstand, without permanent deformation, a force of 300N applied at right angle to any point on the landing face, uniformly distributed over an area of 5 sq. centimetres. The doors shall operate satisfactorily after such a test.

2A.62 Emergency Unlocking of Landing Doors

It shall be possible for an authorised person to open each landing door irrespective of the position of the lift car. Opening shall be by means of a drop key unlocking release in the door panel, complete with baffle plate.

2A.63 Landing Door Frames and Architraves

1. The landing entrance steelwork uprights shall be fabricated from rolled steel sections.
2. The header section shall be fabricated from 6mm flat steel plate, pre-drilled to suit the uprights and track assembly.
3. All landing entrances shall be located within a recess in the landing floor slab and the Contractor shall make provision to fix the threshold steelwork to the structural floor by means of bracketry and concrete anchors prior to the final building in and screeding by others.
4. The Contractor shall make provision for fixing the landing architraves to the entrance steelwork and shaft fabric. The fixings shall not be accessible or visible from the landing or the car.
5. The architraves shall be of Stonehenge design fabricated in patterned stainless steel to the full depth of the shaft wall having a 60mm to 100mm tapered face to the vertical section and a flat 100mm to the horizontal section. The architraves shall be recessed 6mm into the front wall of the landing and shall project from the front wall finish by 20mm.
6. The architraves shall be fabricated in three sections and shall be of bolted construction, the lower section projecting 25mm below floor level to be built in.
7. The rear return of each architrave shall be wide enough to eliminate any finger traps.
8. The 25 mm deep recess for the doors to close into shall be fitted with 3mm buffers, fitted 100mm from the top and bottom of the doors.
9. Adjustable rubber buffers shall be fitted to the entrance steelwork to prevent the landing doors from opening more than 3mm beyond the clear opening width. The buffers shall be fitted 100mm from the top and bottom of the doors.

10. The architrave header at the Ground and Nineteenth Floors shall be engraved LIFT HO..... in 40mm high characters, flush filled with epoxy resin.
11. The architrave shall have reinforced webs for additional strength and for binding during the back filling builders work.

2A.64 Landing Sills

The landing sills shall be 4 mm minimum section, extruded manganese bronze having self cleaning slots and shall be secured by brass countersunk set screws with self locking nuts. The sill and any support steelwork shall cover the full width of the door drive so that each set of door shoes are retained throughout the driven distances.

2A.65 Landing Fascias

Landing fascias shall be fabricated from 16 swg zintec steel sheet and shall extend from each entrance header section to the sill at the next level served and shall be the width of the entrance plus 100mm to each side. The fascias shall be stencilled with the appropriate floor designation in 50mm high characters below each sill

The fascias shall be reinforced and braced as necessary to restrict deflection to 5mm and shall be secured by countersunk set screws at 100mm centres.

Fascias shall also be fitted below the lowest and above the last entrance served, returning to the walls and at no point in the shaft shall the fascias exceed 30mm from the car sills.

2A.66 Landing Stations

The existing back box to the landing station shall be retained and modified to suit the Contractors provision of an extended faceplate that shall be of sufficient length to conceal the back box aperture and to accommodate the landing push at a compliant height of 1000mm centre above floor level.

The extended faceplate shall be angle edged, projecting 30mm from the wall shall be fabricated in 16 gauge satin stainless steel.

The faceplate shall be secured by means of extended 6mm stud welds and nuts located on the shaft side.

The landing station shall incorporate the following:

1. Down call push only plus wiring for possible future up push, full collective modification,
2. Floor number engraved 40mm high characters infilled black.

2A.67 Landing Pushes

All pushes shall meet the requirements of EN81-70 and M2/S2 Building Regulations, shall be flush mounted and shall:

1. Be stainless steel tactile with colour contrast.
2. Incorporate long life LED call acceptance.
3. Be half illuminance at all times with full illuminance. to indicate call has been registered
4. Have an audible signal to signify that a call has been registered.
5. Be flame resistant.
6. Have shock loads on the pressel transmitted to the body of the unit and not the contacts.
7. Be of such design as to make the deliberate 'fixing' of the pressels in the depressed position difficult.
8. Have no fixings visible or accessible from the landings or the lift cars.
9. Have all pushes positioned between 900mm and 1100mm from finished landing floor level.

2A.68 Landing Position Indicator

The landing position indicator shall be enclosed at each floor by a 16 gauge satin stainless steel box and faceplate with fixings identical to those described in Clause 2.66, at a height of 1800mm centre from finished floor level. The faceplate shall be canted to provide maximum field of vision.

1. Each landing shall have a position indicator to the same specification as that provided to the car but shall also incorporate hall lantern features.
2. When the lift is due to arrive at the pre-determined floor the LED direction indicator will light to notify the continuing direction of car travel and the audible signal shall announce imminent arrival. The visible indicator shall be maintained until the doors have closed.
3. The audible signal to activate 5 seconds prior to lift arrival, with 1 signal for UP and 2 signals for DOWN. The signal tone shall be agreed with the SO.

2A.69 Out of Service Indicator

In the event of the lift ceasing to provide service through, malfunction or supply failure, each position indicator shall scroll "LIFT OUT OF SERVICE". The Sub Contractor shall provide the necessary emergency supply to enable this feature to function for 12 hours continuous operation.

2A.70 Firemans Control

Each firemans control switch shall have a bevel edge escutcheon for operation of the drop release key.

The faceplate shall be engraved with the words "ON" and "OFF" in characters 10 mm high and engraved arrows indicating direction of operation of the switch. The faceplate shall also be engraved with the words "FIREMANS CONTROL" in characters 15 mm high and all engraving shall be 3 mm deep and filled flush with red epoxy resin.

Activation of the switch shall change the control of the lift to firemans control. The landing indicators shall identify the lift mode by scrolling the message 'LIFT ON FIREMANS CONTROL'. Under firemans control, the lift shall:

1. FIREMANS CONTROL SWITCH - ON

The lift shall remain in service at any position in the lift shaft upon operation of the switch but car and landing calls shall be cancelled and rendered inoperative immediately.

If the lifts are travelling in the UP direction, they shall slow and stop at the nearest floor without opening the doors and return to the Ground floor. If the lifts are already travelling downwards they shall continue to do so and travel to the Ground floor. If the cars are stationary at one of the floors, they shall return to the Ground floor. In all these cases, the doors shall not open and no calls shall be registered or answered.

On reaching the Ground floor, both the car and landing doors shall open and remain open. The car pushes shall assume control, of the firemans lift only but all landing pushes shall remain inoperative whilst the lift is on Firemans Control.

Registration of a car call and closure of the doors shall only be by sustained pressure on a lift car push, after which the lift shall commence travelling to the registered floor. Should a further call be lodged below the first call once the lift is in motion but within stopping distance, the lift shall answer the lowest call and, upon arrival, shall cancel the other call(s).

The lift doors shall only be opened at floor level by sustained pressure on the 'door open' push and if released before the doors fully open, the doors shall close.

Once fully open the sequence may be repeated.

Whilst on Firemans Control, the car call acceptance indication and the car and landing position indicators will remain operative, the latter scrolling "LIFT ON FIREMANS CONTROL" and the floor position alternatively.

2. FIREMANS CONTROL SWITCH - OFF

The lift shall revert to normal operation.

2A.71 Notices, Labels and Instructions

Unless specified otherwise, all notices and labels shall be engraved on white-red-white paxolene and all shall be securely fixed with screws. All characters shall be of similar style and in capitals.

Adhesive fixing is not acceptable.

In addition to the notices and labels otherwise specified within Part 2 and Clause 3.29, the following notices and labels shall be provided:-

1. To identify all miscellaneous electrical switches within the machine room and shaft including the main isolator and consumer unit fuses.
2. To the controller door advising the clients lift number of the live condition of the equipment.
3. To identify all run/stop switches.
4. A 240mm x 170mm paxoline notice to the lift machine room door stating:

DANGER

UNAUTHORISED ACCESS PROHIBITED
DOOR TO BE KEPT LOCKED

The word "DANGER" shall be red and all other wording shall be black.

The following shall also be provided:-

5. Encapsulated, fully detailed and illustrated, hand winding and emergency release instructions.
6. Encapsulated electric shock notice in accordance with the current IEE Regulations to the machine room.
7. Encapsulated electrical and operational drawings, wall mounted within the machine room, using swivel type brackets.
8. Tool rack to accommodate the landing door drop release key, brake release, safety harness and hand winding wheel if not integral. Each component shall be clearly identified by permanent labels on a shadow board arrangement.
9. Service Log Card and Planned Maintenance Programme.
10. Plastic ring binder with divisions for copies of work sheets, LG1 certification, Statutory Inspection PAS 54, rope and beam test certificates.

2A.72 Guarding

The complete lift installation shall be guarded as necessary to meet the requirements of BS 7255 to ensure the safety of all personnel using, inspecting or maintaining the lift equipment.

All guards containing equipment that requires periodic inspection such as sheaves and overspeed governors shall be fabricated from 12mm rod framing with 25mm welded mesh and be of fixed design with hinged inspection panels. Allen screws shall be used to secure all guarding into permanent fixing points, with the exception of the hand winding wheel guard which shall be fixed using thumb screws. An Allen key shall be placed on the tool board in the machine room.

The Contractor shall provide two fixed harness points to the car sling and a tubular barrier rail with 25mm weld mesh sides to the car top to prevent inadvertent movement into the counterweight and void areas.

A 150mm high zintec skirting shall be fitted to the edges of the car roof.

The design of all guarding shall be agreed by the SO.

2A.73 Machine Room Access

At the bottom of the staircase leading to the lift machine room a gate shall be installed fabricated from angle iron framing and 15mm diameter mild steel infill bars. The gate shall be located in such a manner that safe access from both sides is achieved.

The gate shall be a minimum of 2100mm high and the banister area adjacent shall be clad in 15mm weld mesh contained within an angle iron frame to the same height as the gate. The gate shall be fitted with a Gerda lock free issued by the Royal Borough of Kensington and Chelsea.

At the machine room and roof access staircase a 5mm aluminium chequerplate platform the full width of the staircase shall be erected to the height of the roof door sill, accessed by a set of permanently fixed flat tread steps with handrails.

The platform shall be of sufficient area to facilitate safe personnel access and depositing of tools and equipment prior to entering the roof corridor area, final details to be agreed with the SO

The whole of the steel assembly shall be painted with gloss black rust inhibiting paint, the treads of the stairs and platform to be non slip paint.

2A.74 Painting and Cellulosing

Paint selection shall be approved by the SO and COSHH certificates shall be provided 7 working days in advance of proposed works and in all cases the full requirements of the COSHH certificate are to be implemented to the satisfaction of the SO.

All fabricated and structural iron and steel parts of the lift equipment, but excluding specially finished surfaces, shall be cleaned, wire brushed where necessary, descaled, properly prepared and primed with a zinc-phosphate primer and finished with good quality lead free enamel semi-gloss paint prior to delivery.

All iron and steel rotating parts of the lift equipment, counterweights etc, shall be painted yellow to BS 10E53 in accordance with BS 7255.

Over the whole width of the top edge of the car toe guard the Contractor shall paint alternate 75mm black / yellow stripes at an angle of 45° to the horizontal and to a depth of 150mm.

To the whole 'refuge' areas on the car top and in the lift pit the Contractor shall paint alternate 75mm black / yellow stripes at an angle of 45° to the landing sill.

To all lifting beams and support steels the Contractor shall paint alternate 75mm black / yellow stripes at an angle of 45° to the horizontal.

All fixed guards shall be painted safety orange.

The shaft side of the car and landing doors plus the fascias shall be cellulosed matt black prior to delivery.

Preparation for on site cellulosing maybe undertaken in normal operational hours but all spraying shall be undertaken at nights or weekends.

No on site painting or cellulosing shall be undertaken without 72 hours prior written agreement from the SO.

2A.75 Tests on Completion and Handing Over

After installation of each lift has been completed, the Sub Contractor shall, in the presence of the SO carry out the tests and examinations set out in BS5655 Pt 10, together with any further dynamic or other tests required by the SO to ensure that the installation complies with the specification.

The SO shall not attend site to undertake any witness or commissioning tests until receipt of the Contractors test document and items list, with all items clearly identified as being complete and signed off as witnessed by the Contractors supervisor or project manager.

The SO shall allocate one and a half working days for witness and commissioning tests for the lift. Any additional visits shall be charged as a set off against the contract and the defects liability period shall not be deemed to have commenced until all outstanding works have been completed to the SO's approval, notwithstanding the penultimate paragraph of Clause 2.09.

The Contractor shall provide all test weights, thermometers, test equipment, light meters and special instruments, all with current calibration certificates, and personnel required for this purpose and shall provide the appropriate Certificate of Test and Examination duly completed together with any other necessary Certificates that have requested previously.

In addition to the testing requirements of BS5655 Pt 10 the Contractor shall include for the following supplementary tests:-

1. Load tests by carrying the contract load throughout the travel and at the contract speed for continuous series of consecutive trips aggregating to a period of 30 minutes on mains supply,

During these tests, the motor and controller shall be checked for excessive temperature rise. Checks shall also be made to ensure that the contract speed is maintained and that the levelling limits are not exceeded under no-load conditions and under selected conditions of load.

2. Setting of the main circuit breaker trips in relation to the stalling current and overload.
3. Static balance on car and counterweight to adjust roller guides.
4. Tests to record compliant closing forces on doors.
5. System and motor current readings under full load, balanced load and empty car conditions.

The testing of the lift which shall be designated as the second lift prior to the refurbishment of the first lift shall specifically incorporate the works as detailed below in addition to the testing procedures described above:

6. Setting up and checking of all lock clearances, upthrust rollers and door closer operations.
7. Security of all bottom door shoes and thrust plates.

2A.76 Maintenance and Remedy of Defects

The Contractor shall assume responsibility for maintaining all lifts in accordance with this clause from the date of site possession.

The Contractor shall warrant and maintain the lifts from handover throughout the defects liability period which shall extend from site possession of the first lift, to twelve calendar months from the date of issue of the relevant Acceptance Certificate by the Contractor on Practical Completion of the final lift.

Special Maintenance Requirements During the Refurbishment.

Maintaining continued lift service during the refurbishment is of the utmost importance. The following shall be undertaken to mitigate the effects of one lift only serving the building:

1. The maintenance regime operating throughout the period of refurbishment shall be fully comprehensive with all repairs, both major and minor included within the scope of works.
2. All call backs shall be included with the specific time responses as described in the appropriate clause below.
3. Routine maintenance during the first phase shall be undertaken on a fortnightly basis.
4. Routine maintenance throughout the refurbishment shall be undertaken between the hours of midnight and 5.00 am.
5. Careful dismantling of equipment from the first lift to undergo refurbishment and storing on site as described in clause 1.3.3.

Option Cost 1

The Tenderer shall provide a cost in Schedule 3, Option 1, Page 6/20, to provide the services of a senior grade fitter and mate to standby during the works.

The hours of standby shall be 8.00 am - 8.00 pm seven day per week together with a day work rate for any hours outside that scope. The Option Cost shall be provided on a per week basis. Tenderers unable to source this facility in house shall seek costs from Mr T Vickers - Lift Test Services Ltd [REDACTED] In the absence of a full time standby engineer the refurbishment engineer working on site shall immediately attend to any entrapments and undertake initial endeavours to restore the lift to service following any malfunctions. [REDACTED]

Maintenance to the refurbished lifts shall be undertaken twice each month for the first three months and monthly thereafter.

The lift pit, machine room and all parts of the walls and floor adjacent to the lift equipment shall be kept clean and clear of oil, grease and rubbish and the Contractor shall immediately renew any defective lamps, tubes and indicators including car, access, machine room and shaft lighting.

The maintenance shall include all cleaning, oiling, greasing, and adjustments of all appropriate parts of the lift installation to ensure satisfactory operation, with adjustments made as necessary to maintain the levelling accuracy of the car to within plus or minus 6mm. A steel oil storage cabinet shall be provided in the machine room.

A safety barrier is to be used at all times access is required to the lift shaft and this shall be supplied by the Contractor and left on site. The barrier shall not be left unattended when the landing doors are open.

A report on the condition of the lift inspected shall be forwarded to The Royal Borough of Kensington & Chelsea within ten working days of the date of inspection and the report shall:-

1. Relate to only that lift.
2. State clearly the work done and adjustments required/made.
3. indicate any lamps or indicators replaced
4. certify that the lift is or is not in a satisfactory and serviceable condition.
5. give details of any breakdown since the previous inspection.

During the extended defects liability and maintenance period, the Contractor shall, at his own expense, make good any defective, badly worn or weakened parts resulting from incorrect design, poor workmanship or faulty material.

The Contractor shall undertake any LGI inspections and certification which may become due during the specified maintenance period.

The Tenderer shall operate and include for a 24 hour emergency breakdown service and due to the extremely difficult circumstances during the refurbishment, where a Tower of such a height could be completely without lift service, shall attend to call-outs at all times within 1 hour of reporting of the call. The Contractor shall make such necessary arrangements as required i.e. use of qualified local Contractor, to ensure that the 1 hour response is maintained.

The Tenderer shall advise any special response measures which his service organisation is able to offer, to further mitigate the affects of any malfunctions. Any such measure shall be detailed in the Schedule 2.

In the event of a trap call the Contractor shall ensure that the equipment is rendered safe and that any trapped passengers are released within 30 minutes of the call being received. The Contractor shall make such necessary arrangements as required i.e. use of qualified local Contractor, to ensure that the 30 minutes release for trap release is maintained under all circumstances.

During the defects liability and warranty period the Contractor must be prepared, if and when required, to make nightly and weekend visits in cases of emergency and shall provide the telephone numbers to be used for these call-outs.

Attendance to lift breakdowns resulting from accidental damage, mis-use, vandalism and equipment failures not due to default on the part of the Contractor or his agents shall be paid for against a separate direct order to be issued by the SO.

The Contractor shall allow for one day's training of The Royal Borough of Kensington & Chelsea Tenant Management Organisation staff in usage and emergency release operation.

2A.77 Witness Inspection Points

Witness Inspection Points are to be available to the SO with a minimum of 3 days notice by the Contractor:

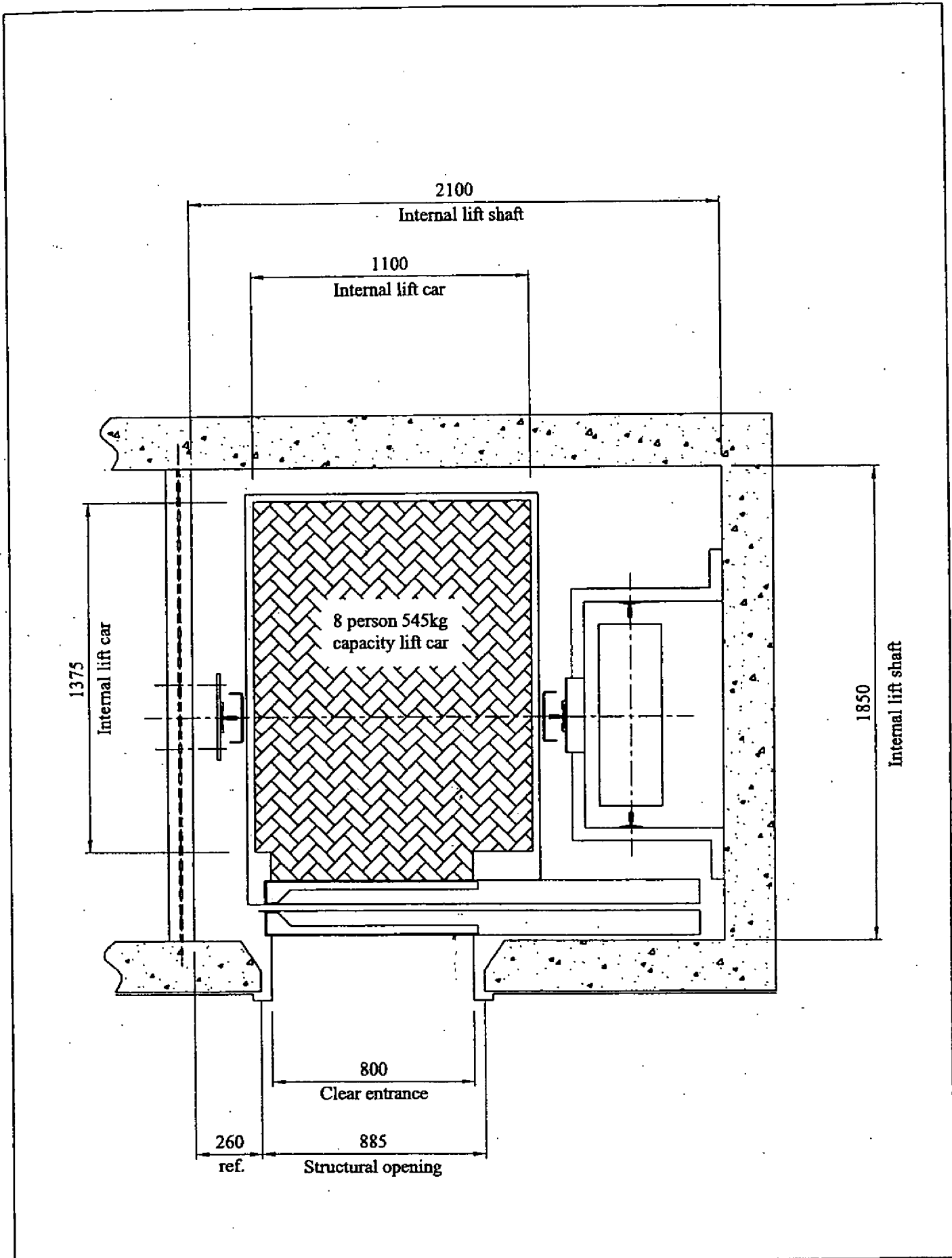
1. Witness inspection of the lift controller under test at the Contractor's Works.
2. Witness inspection of lift car with doors and operator fitted at Contractor's Works.
3. Witness inspection of site readiness.
4. Witness inspection of guide rails with alignment equipment still in position.
5. Witness inspection of machine room after fixing positions of controllers, machines etc.
6. Witness inspection of car, sling, counterweight and diverters and alignment.
7. Witness inspection of main roping and compensation arrangements.
8. Witness inspection of safety gear and all pit equipment.
9. Witness inspection of compensation and governor ropes.
10. Witness inspection of entrance frames and sills prior to building in.
11. Witness inspection of hangers, tracks, doors, closers and locks complete.
12. Witness inspection of architraves, prior to building in.
13. Witness inspection of tubed and trunked lift car, complete with doors and operator.
14. Witness inspection of trailing flexes hung and connected.
15. Witness inspection of shaft and landing equipment, installed and wired.
16. Witness inspection of machine room trunking and conduits, etc. before floor screed is laid.
17. Witness inspection of wired electrical equipment in the machine room.
18. Witness inspection of cleaned down shaft, painting, screens, builders work and lift ready for test.
19. Witness inspection of commissioning tests.
20. Witness inspection of items complete and handover.

The Tenderer shall allow and include for all SO attendances and costs for off site witness tests.

2A/78 Drawings

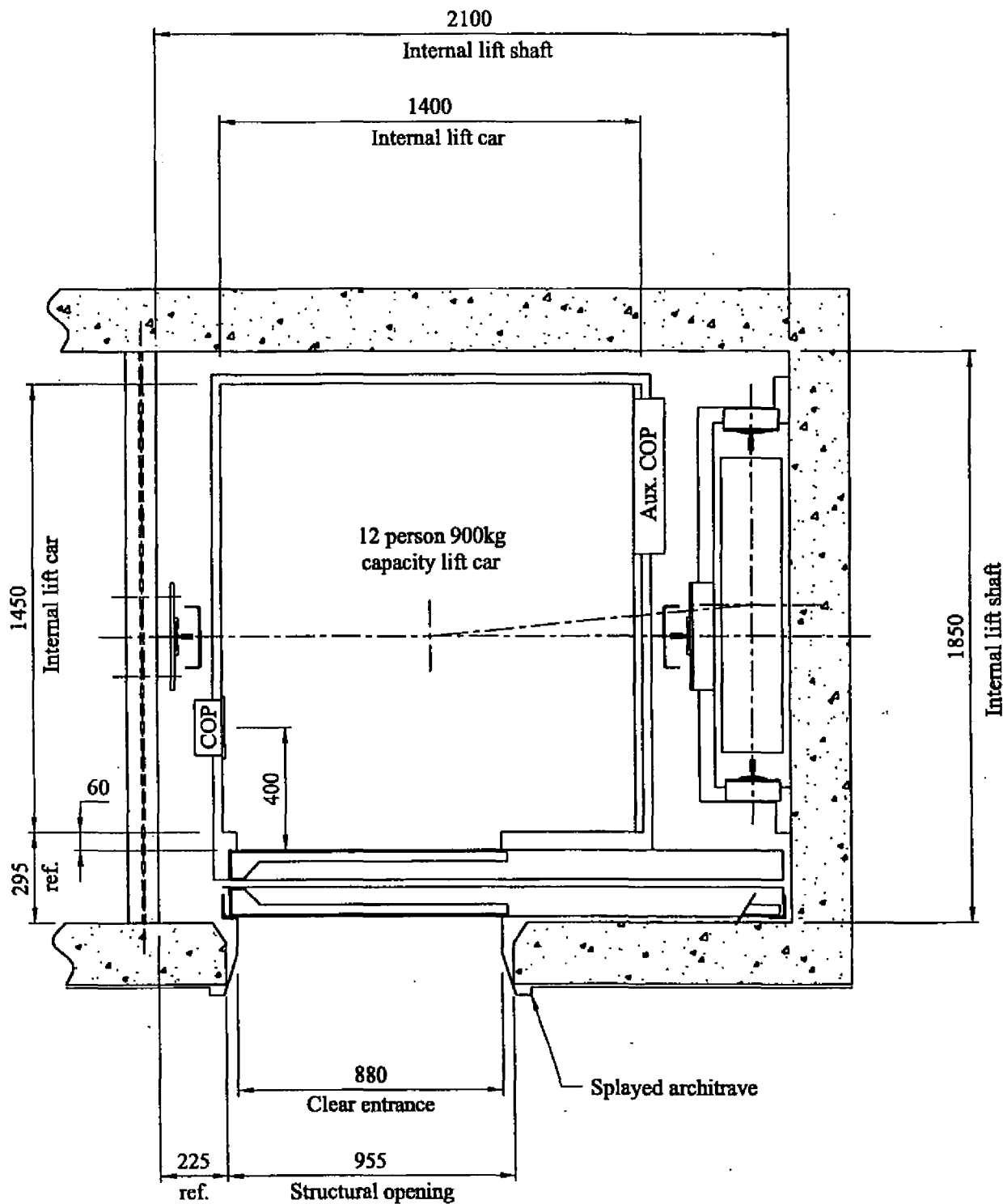
The drawings overleaf detail the suggested means of achieving the requirements of the specification and tender documentation.

The drawings are subject to the Tenderers own detailed assessment and final design, responsibility rests with the Contractor.



Client: Royal Borough of Kensington & Chelsea	Drawing Title: EXISTING ARRANGEMENT Typical Plan on Lift Shaft		Butler & Young Lift Consultants Ltd. Timber Hall, 21 Timber Lane, Caterham, Surrey. CR3 6LZ.
Project: Grenfell Tower	Job No.: L2508	Scale: Do Not Scale 1:20 (Ref. Only)	Telephone: [REDACTED] Fax: [REDACTED] Email: liftconserv@btinternet.com
	Page No.: L2508/01	Date: 04/07/03	

Increase in floor area = 30%
 Increase in entrance opening = 10%
 Increase in load carrying capacity = 65%



Client: **Royal Borough
 of
 Kensington & Chelsea**

Drawing Title:
**PROPOSAL ARRANGEMENT
 Typical Plan on Lift Shaft**

Butler & Young Lift Consultants Ltd.
 Timber Hall, 21 Timber Lane,
 Caterham, Surrey. CR3 6LZ.

Project:
Grenfell Tower

Job No.: **L2508**
 Page No.: **L2508/01**

Scale: Do Not Scale
 1:20 (Ref. Only)
 Date: **04/07/03**

Telephone: [REDACTED]
 Fax: [REDACTED]
 Email: liftconserv@btinternet.com

PART FOUR A

BUILDING AND CIVIL ENGINEERING

SPECIFICATION

TWO ELECTRIC PASSENGER LIFTS, HO90&91

L2508

INDEX - PART FOUR

BUILDING AND CIVIL ENGINEERING

SPECIFICATION OF THE WORKS

Clause No.	Title	Page No.
4A.01	Description of the Works	4A/1
4A.02	Phasing	4A/1
4A.03	Mess and Toilet Facilities	4A/1
4A.04	Protective Hoardings	4A/1
4A.05	Scaffolding	4A/3
4A.06	Plant and Cranage	4A/3
4A.07	Preparation of the Shaft and Landing Entrances	4A/4
4A.08	Preparation of Machine Room	4A/4
4A.09	Non-Hammered Cutting	4A/4
4A.10	Building in of Lift Entrances	4A/4
4A.11	Machine Room Builders Work	4A/5
4A.12	Lifting Beams	4A/5
4A.13	Air Vents	4A/5
4A.14	Painting	4A/5
4A.15	Finishes	4A/6

PART FOUR A - TWO ELECTRIC PASSENGER LIFTS, HO90&91

BUILDER'S WORK REQUIREMENTS

4A.01 Description of the Works

The builders and associated works incorporate the provision of all storage areas and containers complete with all temporary protection, hoardings, compounds and storage areas plus attendance for the specific works to the shaft, machine room, landings and other areas in association with the lift refurbishment, all in conjunction with the specification and the drawings as listed, and as particularly described in the Contract and Preliminaries with this Tender document.

The Contractor shall take a photographic schedule of the condition of each landing entrance prior to erection of the hoardings and issue one set of prints to the SO.

The Contractor shall at all times ensure that his method of work does not impede access.

A 30sq m. area of the Walkway level shall be made available for the erection of a heavy duty, metal compound enclosure that shall be speedily constructed for the project. The floor area within the enclosure and supply route areas outside the enclosure shall be fully protected by means of 6mm plywood sheets. If not erected from floor level to ceiling the hoarding shall have a metal fabricated roof.

4A.02 Phasing

The Tenderer shall provide a bar chart with the tender return detailing the Programme of Works which shall be written into the Contract.

Tenderers may propose a method of work to reduce the installation programme whilst still meeting the requirement of the specification. In consideration of this, the Tenderer shall include a detailed method statement and risk assessment, together with evidence of the Tenderer having successfully employed any such methodology during previous projects.

Liquidated and ascertained damages shall be attributed to the programme.

4A.03 Mess and Toilet Facilities

The Contractor shall provide storage, office and mess room facilities for his operatives and his sub-contractors, complete with all temporary services.

4A.04 Protective Hoardings

The Contractor is reminded that the hoardings open directly on to the landings and the staircases, to which the residents have access, and that the appearance and containment of noise shall be taken into account in the design of the hoardings.

A drawing of the hoardings shall be submitted for approval by the SO.

Prior to the removal of any existing lift equipment, the Contractor shall provide a rigid protective hoarding to each entrance to the lift. The hoarding shall extend to a minimum height of 2.4m or to ceiling level and shall enclose such working space as is available to a minimum depth of 900mm. The enclosure shall extend the full width of the shaft plus the landing fixtures and shall abut the adjacent architrave, but in so doing shall not obstruct access or means of escape.

The hoarding shall incorporate a temporary riser of pushes to the side wall adjacent to the lift remaining in service with pushes located 900mm to 1100mm from FFL. The riser shall incorporate a zintec back box and the faceplate shall be secured by semi secret fixings. The stations and wiring tails shall be prepared in advance and a lift engineer shall be present during the erection of the hoarding to connect each set of pushes in order to minimise loss of facilities.

The closed area immediately beyond the lift entrances at the Ground Floor shall be enclosed by a hoarding to the full protective requirements of this clause. Should the right hand lift be undertaken in the first phase then this hoarding may extend forward to fully enclose both entrance and the closed area during these works.

Due to the very restricted single point of access at the Ground Floor this closed area shall be used for containment of the lift car panels and small hand held items of equipment only, not for storage of entrances, builders rubble and other associated equipment and materials which are to be stored in the compound at Walkway level.

Each hoarding shall have a hinged and lockable access door meeting half hour fire resistance to a clear height and width to suit the Contractor's requirements. The hoardings shall be assembled from 20mm plywood and shall have 75mm x 50mm softwood framing to all edges.

The doors shall be not less than 20mm plywood with recessed hinges and shall be framed and braced with 75mm x 50mm softwood. The access doors shall open outwards, with restraints, from the lift shaft through an arc of not more than 90°, or as may be directed by the Building Control Officer.

The access doors shall be fitted with a mortice lock which shall be operable with the same key to all hoardings and six keys shall be provided for the use of the SO. Two 800mm shoot bolts shall be fitted on the inside of each door which shall have an external notice, stencilled 'DANGER - KEEP OUT', with an additional notice advising the floor number.

The floor surface within the hoarding shall be protected over the entire area with hardboard over polythene sheeting and the top section to the enclosure shall be boarded over.

The hoarding shall return as protection to the face of the painted landing walls and these areas to be lined with polythene and 15mm Tentest to protect the finishes.

Gaps between any adjoining surface shall not exceed 3mm and the method of fixing the hoardings shall be agreed with the SO and shall be such that the fixings cannot be removed from outside of the hoardings. The Contractor shall maintain the hoardings and doors in a safe condition through the duration of the work and shall not remove them until the day on which the lift is to be put into service, except by prior agreement with the SO.

All hoardings shall be constructed of new materials that shall adequately reflect the area within which they are sited.

The Contractor shall paint the hoardings two coats emulsion to generally match the surrounding area once erected and shall make provision for repainting on each subsequent phase of the Contract.

The Contractor must be prepared to meet any additional requirements of the Building Control Officer as to the construction, fire resistance, overall dimensions, access doors and frames.

Under no circumstances are materials, products or equipment whether old or new, contractors or his sub-contractors be left unattended outside of hoardings or site storage areas.

4A.05 Scaffolding

Scaffolding shall be provided in the shaft for the use of the lift erectors and for builders work use and due allowance shall be made for cutting scaffold poles and boards to fit the shafts.

Working platforms shall be provided at 2.2m centres in the shaft and the Contractor shall include for inspecting and recording the scaffold condition weekly, making any necessary adjustments to ensure safe working conditions are maintained.

The scaffold shall have a removable section at the lowest floor to allow access for pit and lift car works.

4A.06 Plant and Cranage

The Contractor shall provide all necessary plant, hoists and/or cranes to remove, position and install lift equipment and building materials and shall include all negotiations with the Police and Public Authorities for the appropriate authorisation.

Scaffold boards shall be used to support all materials and equipment temporarily landed or stored on exposed areas and securely fastened, heavy duty, weatherproof sheeting shall be used to protect the materials.

Tenderers may propose an alternative for the delivery of materials to the Walkway level compound storage area and shall describe their preferred method in Schedule 2. Mobile cranes may be used on a limited number of occasions during the course of the project to deliver consolidated shipments of materials on a per lift basis.

Alternatively, a scaffold construction at the rear of the Ground and Walkway levels may be considered, together with a builders hoist. Should this method be preferred then the Tenderer shall provide full details in respect of protection of this facility and the general public within the precinct.

4A.07 Preparation of the Shaft and Landing Entrances

It is imperative that dust and debris is contained within the shaft and machine room during the preparatory works and the Contractor shall undertake the following programme plus any other works that he sees fit.

After careful removal of the existing lift installation, all redundant bolts, steelwork and brackets within the lift shaft be cut out or off and made flush to the shaft surface and on completion of all cutting away the Contractor shall render all surfaces flush and smooth.

After removal of the existing landing entrance equipment the Contractor shall trim each vertical section of the concrete aperture to achieve a clear width of 1000mm to enable the installation and backfilling of the tapered section architrave.

The Contractor shall also prepare the recess for fitting of the sill and this operation together with enlarging the entrance width shall be undertaken using conventional percussive methods.

On completion of all these preparatory works and prior to any other works the Contractor shall thoroughly clean down the shaft by vacuum method.

The Tenderer shall provide a cost under **Option 2, Page 6/20 in Schedule 3**, to undertake enlarging the landing entrances by trimming the structural openings by alternative appropriate quiet methods such as diamond, drilling or sawing, with the provision that the timescale allowed for such works shall be extended to 8.30 am - 5.00 pm Monday to Friday. The Tenderer shall, in addition, identify the programme implications of such methods within the tender return.

4A.08 Preparation of the Machine Room

Existing concrete machine slabs or supports shall be broken out by the hydraulic bursting method.

4A.9 Non Hammered Cutting

All demolition works and recesses, holes, pockets and additional fixings for guide brackets shall be cut by non-hammered tools. These works shall be undertaken between the hours of 9.30 a.m. and 4.30 p.m., by prior arrangement with the SO.

4A.10 Building in of Lift Entrances

When properly positioned and fixed, the landing entrance equipment shall be back filled and built in.

4A.11 Machine Room Builders Work

The Contractor shall employ the services of a structural engineer to determine the suitability of the existing walls and building fabric to meet the new conditions and shall include for any additional works proven necessary by the calculations, copies of which shall be forwarded to the SO.

The Contractor shall form new holes for ropes and trunking and shall make good all redundant rope, conduit and trunking holes in the slab and shall make good the floors with a smooth, level, trowelled finish. Any conduits on the floors shall have a minimum of 30mm screed cover.

The Contractor shall employ the services of The Royal Borough of Kensington & Chelsea specialist contractor to remove the asbestos liner to the machine room access hatch and replace same with Durasteel sheet, in the first week of the project.

The Specialist Contractor is: Slough Thermal Insulations Services
19 Willoughby Road
Langley Slough SL3 8JH
Tel: [REDACTED]
Contact: L R Gibbons Esq.

The Contractor shall clear all debris and rubbish from the machine room and roof access corridor in the first week of the project and in readiness for painting.

4A.12 Lifting Beams

The existing lifting beams may be re-used and the Contractor shall confirm their suitability for retention.

All lifting beams shall be load tested and certified to 1000kg, with the load and date of test stencilled in the web of the beam.

4A.13 Air Vents

The Contractor shall remove and clean the air vents and fit mesh fly screens to shaft and machine room.

4A.14 Painting

Immediately upon completion of the works outlined in 4A.08 and 4A.11, the Contractor shall paint the machine room and the roof access corridor with one coat stabiliser and two coats white emulsion.

Tenderers shall provide a cost under **Option 3, Page 6/20 Schedule 3**, to paint the lift shaft walls in accordance with the above.

Immediately after removal of the lift installation the heavily oil contaminated pit shall be degreased with solvent. The floors to the machine room, the roof access corridor, the pit and the pit walls to 300mm high shall be painted with red non-slip paint.

4A.15 Finishes

The Contractor shall finish the linings and floor finishes up to the trims, architraves and sills where these items are affected by the works and thus making good shall match or harmonise with the adjacent finishes.

Where the front walls are painted they shall be repainted to harmonise with the existing décor to ceiling level and to the nearest door jamb or corner.

PART TWO B

LIFT SPECIFICATION

ONE HYDRAULIC PASSENGER LIFT, HO92

L2508

INDEX - PART TWO B**LIFT SPECIFICATION**

Clause No.	Title	Page No.
2B.01	Tenders	2B/1
2B.02	Programme	2B/1
2B.03	Products, Equipment and Materials	2B/2
2B.04	Cost of Inspecting Products, Equipment and Materials	2B/3
2B.05	Regulations	2B/3
2B.06	Design Standards	2B/4
2B.07	Related Documentation and References	2B/4
2B.08	Drawings to be Provided	2B/6
2B.09	Drawings and Maintenance Manuals on Completion	2B/7
2B.10	Proprietary Products	2B/8
2B.11	Controller: General	2B/8
2B.12	Controller: Microprocessor Requirements	2B/9
2B.13	Controller: Instrumentation	2B/11
2B.14	Controller: Single Lift Control Logic	2B/13
2B.15	Controller: Variable Frequency Vector Drive Power System	2B/16
2B.16	Controller: Door Operator	2B/17
2B.17	Rubber Insulating Mats in Pump Room	2B/18
2B.18	Hydraulic System: General	2B/18
2B.19	Hydraulic System Operation	2B/19
2B.20	Hydraulic Power Unit with Energy Accumulation	2B/19
2B.21	Pump Motor	2B/20
2B.22	Valves	2B/20
2B.23	Levelling Accuracy	2B/21
L2508		

INDEX - PART TWO (Continued)

2B.24	Cylinders and Rams	2B/21
2B.25	Permanent Pressure Test Port	2B/21
2B.26	Rupture Valve	2B/21
2B.27	Pipes and Hoses	2B/21
2B.28	Anti Creep Device	2B/22
2B.29	Hydraulic Oil	2B/22
2B.30	Emergency Manual Operation	2B/22
2B.31	Pawl Device	2B/22
2B.32	Isolation	2B/23
2B.33	Hand Operation Floor Zone Indicator	2B/23
2B.34	Auxiliary Stop Switch	2B/23
2B.35	Guides and Guide Brackets	2B/23
2B.36	Guide Shoes	2B/24
2B.37	Pit Ladder	2B/24
2B.38	Pit Stop Switch and Shaft Access	2B/24
2B.39	Limit Switches	2B/24
2B.40	Car Sling and Platform	2B/24
2B.41	Car Sub-Floor	2B/25
2B.42	Crown Bar Records	2B/25
2B.43	Car Top Maintenance Control Station	2B/25
2B.44	Car Top and Car Bottom Clearance	2B/26
2B.45	Lift Car: Floor Covering	2B/26
2B.46	Lift Car: Sill	2B/27
2B.47	Lift Car: Toe Guard	2B/27

INDEX - PART TWO (Continued)

2B.48	Lift Car: Enclosure	2B/27
2B.49	Lift Car: Station	2B/29
2B.50	Lift Car: Pushes	2B/30
2B.51	Lift Car: Load Sensing Device	2B/31
2B.52	Lift Car: Alarm Sounder	2B/31
2B.53	Lift Car: Voice Synthesiser	2B/31
2B.54	Lift Car: Hands Free Auto Dialling System	2B/32
2B.55	Lift Car: Lighting	2B/32
2B.56	Lift Car: Emergency Lighting and Alarm Supply	2B/33
2B.57	Lift Car: Forced Ventilation	2B/34
2B.58	Automatic Power Door Operator	2B/34
2B.59	Passenger Protection	2B/35
2B.60	Car and Landing Doors	2B/35
2B.61	Emergency Unlocking of Landing Doors	2B/36
2B.62	Landing Door Frames and Architraves	2B/36
2B.63	Landing Sills	2B/37
2B.64	Landing Fascias	2B/37
2B.65	Landing Stations	2B/38
2B.66	Landing Pushes	2B/38
2B.67	Landing Position Indicators	2B/39
2B.68	Out of Service Indicators	2B/39
2B.69	Notices, Labels and Instructions	2B/39
2B.70	Guarding	2B/40

INDEX - PART TWO (Continued)

2B.71	Painting and Cellulosing	2B/40
2B.72	Tests on Completion and Handing Over	2B/41
2B.73	Maintenance and Remedy of Defects	2B/42
2B.74	Witness Inspection Points	2B/43

**PART TWO B - LIFT INSTALLATION - ONE HYDRAULIC PASSENGER LIFT, HO92
SPECIFICATION AND STANDARDS OF MATERIALS AND WORKMANSHIP**

2B.01 Tenders

The Tenderer shall include for the supply of the whole of the products, equipment and materials in accordance with this specification and the whole of the fixing works necessary for the complete lift installation plus builders, structural, electrical and other associated works as detailed in the tender documentation.

The Tenderer shall visit the site to undertake a detailed survey in order to determine the full extent of the work required. No claims arising out of any misunderstanding or want of knowledge of the nature or extent of the work shall be allowed.

This specification shall be read in conjunction with the conditions of contract and any supplementary specification(s), schedule(s), drawings and other documents enumerated in the invitation to tender. In the event of any discrepancy between the clauses in this specification and any related document the Tenderer shall immediately inform the appointed Supervising Officer, (SO), to provide technical information.

In particular the specification shall be read in conjunction with Schedules 1, 2 and 3 which form the basis for the tender submission and which shall identify the equipment offered. Schedules 2 and 3 must be completed in their entirety and returned together with all other documentary information requested.

Should anything be omitted from this specification, which is fitting and usually considered necessary for due and proper completion of the work, the Tenderer shall verbally bring this to the attention of the SO prior to tender submission with confirmation in a letter prior to submitting the Tender return.

The Tenderer shall make due allowance in his tender return for undertaking the role of Principal Contractor as defined in the Construction (Design and Management) Regulations 1994, (as amended) (CDM).

This shall particularly include a detailed Health and Safety Plan with method statements and risk analysis based on the Contractor's own site surveys submitted to the SO 30 days prior to the site start date. Final copies, incorporating received comments, shall be provided to the SO 14 days prior to the start on site. Site copies, including a complete bound copy of the contract specification, shall be located within the machine room together with the site diary.

2B.02 Programme

The Tenderer shall submit a detailed bar chart programme and method statement for the whole works with the tender. The programme and method statement shall make due recognition of all project stages with the intent to minimise disruption and disturbance during the works.

The Contractor's staff and subcontractors shall carry photographic identification cards and shall wear attire having the company logo or name, throughout the contract programme.

The Contractor shall make adequate provision for achieving all design and manufacturing works prior to commencing work on site. Should the SO be required to perform additional duties or to attend site due to matters that should realistically have been previously identified by the Contractor then any resultant charges by the SO shall be set off against the contract.

The Social Services Office shall remain fully occupied throughout the project duration and the programme shall make due recognition at all project stages of the intent to minimise disruption and disturbance during the works, with the need for particularly disruptive and noisy operations to be fully co-ordinated with the SO.

Liquidated and ascertained damages shall be attributed to the programme.

Normal hours of working on this contract are 8.00am - 6.30pm Monday to Friday and 8.00am - 1.00pm Saturday.

Drilling, cutting or otherwise of the building fabric shall be programmed and agreed with the SO and shall be undertaken between the hours of 9.30am and 4.30pm Monday to Friday.

Maximum contract durations and proposed dates shall be as detailed below and whilst the calendar dates may vary the actual weeks shall not be exceeded:

Contract Award by	3 rd September 2004	
Construct New Pump Room	14 th November 2005	(6 weeks)
Design, Manufacture, Procurement and Delivery	19 th January 2006	(70 weeks)
Possession of Shaft	19 th January 2006	
Handover	1 st April 2006	(12 weeks)

Note! Each phase includes witness testing, commissioning and snagging.

2B.03 Products, Equipment and Materials

The Tenderer shall clearly identify the products, equipment and materials offered by way of specific part numbers and any other information necessary in Schedule 2. In all cases products offered are to be generic and non-proprietary with spares and support readily available to persons other than the original supplier or installer.

Specialist equipment or data that is required to maintain continuity of service and performance characteristics or to access the equipment shall be provided, with full training, within the Contract and shall **UNEQUIVOCALLY** become the property of The Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd.

If there is any doubt over the compliance of specific items then further details of approved products for this Contract can be obtained from the SO, on request, and the Tenderer shall be deemed to have obtained any such details before submitting the tender.

Products and equipment approved for use on previous contracts shall not necessarily be approved for use on this Contract and the SO may require the Tenderer to submit, for approval, samples of products and/or equipment.

The type of products offered shall have been in commercial operation for at least two years prior to the tender and shall have a substantial record of reliability whilst operating on continuous duty and under conditions similar to those which shall apply on this project.

The full technical details of any products or items of equipment must be available to the SO at tender stage and if so requested, the information must be provided within 3 working days.

2B.04 Cost of Inspecting Products, Equipment and Materials

The SO shall have the power to recover from the Tenderer, by deduction or otherwise, the cost of testing any products, materials or items of equipment which the SO requires to be tested and which, when tested, are found to be unsatisfactory.

2B.05 Regulations

It shall be understood that the equipment specified and that the characteristics of the site, particularly dimensions and clearances, may not fully comply with current British and European Standards and these shall be qualified by the Tenderer in the tender return.

Although it is recognised that the existing structural constraints shall prevent full compliance with harmonised European Standards, the requirement is for the lift installation to include all of those items and features that do comply, as far as is reasonably practicable.

The products, equipment, materials and installation shall comply with all relevant statutory instruments and regulations and in particular those listed in Clauses 2.06 and 2.07.

The successful Tenderer shall be required to obtain all necessary authorisations and derogations from their Notified Body and the DTI and due allowance for any costs shall be made within the tender. It is essential that the complete lift is CE Marked and the employer is provided with a Certificate of Conformity.

Where the existing structural constraints, particularly in the lift pit, at the top of the lift and the shaft prevent the necessary clearances being obtained for the protection of maintenance and inspection personnel, alternative means or safe systems of work shall be provided to give equal protection, and identification of these shall be detailed with the Tender return.

Where the premises concerned are not subject to such statutory controls they shall, for the purpose of the application of this specification, be deemed to be subject to such statutory controls.

The tender shall be based on the regulations current three months prior to the date for return of the tender. If these regulations are amended or new regulations enacted that shall affect the works after that date, the Tenderer, and subsequently the Contractor, shall immediately inform the SO in writing.

2B.06 Design Standards

The equipment and installation shall conform to this specification and to the relevant British Standards including Codes of Practice and, in particular, BS 5655, BS 7255 and EN81-1. Where this specification differs from those standards and codes, the provision of this specification shall prevail.

Reference to British Standards and Codes of Practice shall mean the edition current three months prior to the date for return of tenders. A certificate of compliance with the relevant British Standards shall be provided to the SO on request. Any changes during the course of the contract in the relevant British Standards and Codes of Practice shall be brought to the attention of the SO by the Contractor.

It shall be understood that the existing characteristics, particularly dimensions and clearances, may not comply with current British Standards and these shall be qualified in the tender return.

The lift is required to function under the following conditions without prejudicing the overall performance:

1. Temperature between +5°C and +40°C
2. Dust or dirt laden atmosphere subject to the effects of moisture.
3. Electrically noisy supply and atmosphere.
4. Mechanical vibration.

Unless stated otherwise in this specification the safety factor shall be 5 or greater for all parts of the equipment. The safety factor shall be calculated on the basis of maximum imposed loads and calculations shall be provided to the SO should they be requested.

2B.07 Related Documentation and References

This tender documentation shall be read in conjunction with, and its requirements are in addition to, the general conditions of contract and any drawings and other documents issued with it and listed in this invitation to tender and as set out below.

Health and Safety at Work etc. Act 1974 (HSWA)
Disability Discrimination Act 1995 (DDA)
Management of Health and Safety at Work Regulations 1999 (MHSWR)
Workplace (Health, Safety & Welfare) Regulations 1992 (WPR)

Provision & Use of Work Equipment Regulations 1998 (PUWER)
Lifting Operations & Lifting Equipment Regulations 1998 (LOLER)
Reporting of Injuries, Diseases & Dangerous Occurrences Regulations 1995
(RIDDOR)
The Lifts Regulations, 1997
Factories Act 1961
Electricity at Work Regulations (H&SE).
Offices Shops and Railway Premises Act 1963
LG1 SAFed Regulations
PM26 - Safe Working at Landings
Control of Pollution Act 1974
The Building Regulations
The London Fire Brigade
The London Electricity Board
The Building Industry National Codes of Practice for Passenger Lifts
Supply of Machinery (Safety) Regulations 1992
Electromagnetic Compatibility Regulations 1992
I.E.E. Regulations for Electrical Installations, current edition
CDM Regulations 1994, Managing Construction for Health & Safety
CIBSE - Guide D, Transportation Systems in Buildings
COSHH - Current edition
BS 2633 - Arc welding of ferritic steel
BS 308 - Drawing practice.
BS 3939 - Graphical Symbols for electrical power, telecommunications and
electronic diagrams.
BS 4568 - Steel conduits and fittings.
BS 4568 - Metric steel conduit
BS 4678 - Cable trunking.
BS 476 - Fire tests on building materials and structures.
BS 5420 - Degree of protection of enclosures for LV switch gear.
BS 5514 - Overload requirements
BS 5536 - Preparation of technical drawings for micro filming.
BS 5588 - Fire Precautions in the design, construction and use of building
BS 5655 - Lifts and Service Lifts.
BS 5674 - Thermosetting armoured cables
BS 5750 - Quality management system.
BS 6207 - MICC Cables
BS 6231 - PVC insulated cables
BS 6977 - Insulation for lifts and for other flexible connection.
BS 7211 - Thermosetting cables for electrical supplies
BS 7255 - Safe Working on Lifts
EN81-1 - 1998 Safety Rules for the Construction and Installation of Lifts.
EN81-70 - 2003 Accessibility to Lifts for Persons Including Persons with Disability
BS 7671 - Requirements for Electrical Installation
BS ISO 9000, 9001, 9002, 9003 - Quality Assurance
BS EN 60947 - Specification for low voltage switchgear and control gear.
PREN 1050 - Safety of machinery risk assessment
LPS 1207 - Loss prevention standard.

2B.08 Drawings to be Provided

All drawings provided shall be CAD generated by means of AutoCAD Release 14, AutoCAD LT2000 or equivalent software.

Drawings shall follow BS 304 drawing convention and shall be appropriately scaled to a conventional size to best fit the paper i.e. 1:5, 10, 20, 25, 50 or 100 on A4, A3, A2, A1 or A0 paper, to clearly provide the intended information to be given.

1. General arrangement indicating weight and position of all equipment, with loads imposed on the building structure.
2. Details of all cutting away, plinths, channels, apertures and concrete bases, complete with all dimensions in respect of the building structure or lift well and all other builders, electrical or associated requirements.
3. Pump, tank unit and accumulator details.
4. Details of the landings, incorporating sill, door, entrance and architrave/trim construction.
5. Construction of hoardings, protected areas and storage area.
6. Landing push station and other fixtures.
7. Details of car, sling and platform construction.
8. Details of lift car design incorporating hinged car stations and finishes schedule.
9. Details of all engraving to the Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd requirements.
10. All electrical details relating to existing and new supplies, terminations within the machine room and ratings relative to full and no load, fuses and any other calculations deemed necessary, including operating temperature range and heat output of the equipment.
11. The Contractor shall produce a montage incorporating a colour wash isometric drawing of the proposed lift car and samples of the selected car and landing finishes as agreed by the Royal Borough of Kensington and Chelsea Tenant Management Organisation Ltd.
12. All drawings shall incorporate a finishes and components schedule.

Four copies of drawings 1-4 shall be submitted to the SO for consideration and comment within four weeks of contract award and, allowing one week for comment by the SO, four copies of the as amended drawings shall be issued within a further one week of receipt by the Contractor.

The remaining drawings shall be submitted two weeks after 1-4 with amendments to follow as above.

2B.09 Drawings and Maintenance Manuals on Completion

The Contractor shall provide the following drawings, generated as in 2.08, in accordance with this specification and also a complete maintenance manual as detailed below:-

1. 'As fitted' record drawings.
2. Details of the car and landing door construction and arrangement.
3. Straight line and schematic wiring diagrams for the lift installation, including all electrical apparatus, as wired and fitted. The diagrams shall show the arrangement and marking of all electrical connections and be complete with key reference to symbols and abbreviations used.

One set of the as fitted electrical drawings shall be encapsulated in plastic and wall mounted within the machine room using swivel type brackets.

All electrical drawings shall be to BS 308 using electrical symbols to BS 3939 and be microfilm quality in accordance with BS 5536. Three sets of paper print drawings will be required plus one complete set of microfiche drawings to the system adopted by The Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd.

4. A description of the scope, purpose and manner of working of each system, product or equipment forming part of the lift;
5. A detailed description of circuit operation, including the supervisory logic and motion control;
6. Data on the setting up and testing of the lift equipment;
7. Instructions for dealing with fault diagnosis and remedial action for each system;
9. Instructions detailing functions and usage of any hand held diagnostic or test equipment relating to the controller and floor setting system or door operator.
9. Planned maintenance programme.
10. Any precautions necessary for ensuring Health and Safety and avoidance of misuse together with details of all emergency procedures.
11. Copies of all certificates and inspection reports relating, but not limited, to
 1. Mill certificates for the finished stainless steel used in fabrication of the cars, doors, architraves and other elements of the project.
 2. All type testing and CE marking,
 3. NICEIC tests,

4. Tests to EN81-1 - PAS 32, as amended,
5. Lifting beam tests,
6. Clause 2.70 of the specification, Painting and Cellulosing,
7. Manuals by specialist subcontractors.
8. The names, addresses and telephone numbers of the suppliers of all major components;
9. Spare parts lists for components that normally need to be replaced due to fair wear and tear, together with those considered essential to maintain the lift in service, e.g. certain printed circuit boards.

The lift shall not be deemed to have been accepted nor achieved practical completion until the drawings, maintenance manuals and Contractors Health & Safety File in accordance with CDM regulations have been received and approved.

After submission and approval of the draft manual by the SO, three copies of hard backed maintenance and operating manuals shall be provided.

2B.10 Proprietary Products

Proprietary products, when agreed with the SO, shall in general be inspected and tested against the manufacturer's specifications and shall be furnished with a certificate of conformity or a type test certificate.

2B.11 Controller: General

The control of the lift shall be simplex full collective and fully automatic arranged for operation by passengers without an attendant and serving each floor. It shall incorporate power operated car and landing doors and indication circuits for:

1. Car position,
2. Call acceptance,
3. Lift out of service,
4. Lift undergoing maintenance,
5. Lift on car preference,
6. Electronic hall lanterns,
7. Lift overloaded,

The micro processor shall have 'field proven' components.

Floor selection shall be via a tape head device with lift position reference holes in a stainless steel tape to determine floor levels, slowing and stopping zones.

The momentary pressure on any number of car or landing pushes, activating call requirement, shall be stored in the system until answered.

The car shall answer the calls in the order in which the landings are reached and once the car has started travelling in one direction it shall answer the car and landing calls for that direction only. The lift car shall not reverse until it has answered the highest or lowest outstanding call.

With no calls on the control system, the lift shall return and park at the Ground Floor.

When the car stops at the required floor in response to a car or landing call, the doors shall automatically open and automatically close after a time interval. This time interval shall be shortened by the operation of a floor push in the car.

Should a passenger wish to re-open the door, pressure on the 'Door Open' push in the car station shall reverse the motion of the doors, providing the lift has not started.

2B.12 Controller: Microprocessor Requirements

1. Enclosures

The control equipment shall be mounted in a sheet steel enclosure, with lockable hinged panels for front access only. The controller shall have a clear space of 150mm to the rear for the unforeseen event that rear access may be required in the future.

2. Cable Entry

All cabling associated with lift control etc. shall be routed through entries in the base of the cabinet.

Any alternative method shall have the same effect but must be approved by the SO.

3. Panel Wiring

Panel wiring shall not support combustion, shall be low smoke emission and shall comply with BS 6231. Positive fixing of cable terminations shall be with purpose made clamps or pinch type terminals or by use of crimped cable tags each with an efficient locking device.

Live terminals connected to 240V or higher shall be adequately shielded to allow for safe live working conditions.

All control relays, contactors and safety circuits shall be 240V a.c. and all car and landing push feeds shall be 100V d.c.

No control circuit voltage operating in conjunction with external controller equipment shall be less than 100V.

4. Micro Computer Protection

The micro computer section of the controller shall be separately enclosed in the control cabinet such that the inadvertent connections of high voltages or physical damage from falling objects is prevented.

All incoming signals shall be via 100V d.c. terminals through filters and opto isolating circuits in the protected area.

5. Coils

All relay and contactor coils shall be continuously rated. Neither telephone type relays nor economy resistors with AC contactor coils shall be used.

6. Thermistor motor protection

Thermistor motor protection and associated controller equipment shall be incorporated in the control panel and shall be fully adjustable to suit the size conditions.

7. Heat Dissipation

Any components which may generate significant quantities of heat shall be external to the controller but enclosed and ventilated.

8. Forced Ventilation

If the controller uses forced ventilation then any inlet vents shall be protected by removable filters with a minimum life of 12 months. Failure of the fan shall not cause overheating of the lift equipment.

9. Micro Section Ventilation

The micro computer section of the controller shall have cooling and if this utilises forced ventilation then any inlet vents shall be protected by removable filters with a minimum life of 12 months. Failure of the fan shall not cause overheating of the lift equipment.

10. Environmental Temperatures

The micro computer section shall be capable of operating in environmental temperatures ranging from +5 to +40 degrees centigrade.

11. Input and Output Isolation and Protection

All input and output lines shall be so protected as to prevent the micro computer controller from being damaged. This means that all printed circuit boards, wiring on the micro computer area, terminating pins, bus lines etc. shall be physically protected from inadvertent connection to high voltages.

All input and output lines must be capable of withstanding short circuits and the application of up to 500v. Such application may result in input and output components e.g. fuses, protection resistors, diodes etc., being damaged and hence the equipment shall be designed to allow their rapid identification, removal and replacement.

All outputs shall incorporate interface relays capable of switching 5 amp at 250V d.c.

All circuit board edge connections shall be plated gold and all input/ output floor plug-in boards shall be interchangeable.

12. Identification

All parts of the equipment shall be adequately identified by permanent labels corresponding to designations on the wiring diagrams, in particular:

1. Terminals
2. Wiring by way of sleeves at all terminations
3. Equipment items
4. Card frame positions

13. Wiring Convention

All wiring shall be identified and identification sleeves, in compliance with the wiring diagrams, shall be provided at cable terminations. All specific computer wiring shall be identified in a different colour or style to the conventional wiring. A list of wiring codes, mnemonics and symbols shall be posted in the machine room.

14. Symbols and Abbreviations

A key to any abbreviations and symbols shall be fixed to the inside of each enclosure.

2B.13 Controller: Instrumentation

1. Indicators

Indicators shall be provided on the controller showing:

1. Car position,
2. Hall calls accepted,
3. Lock status,
4. Car direction up or down,

5. Car "In service",
6. Car door status open, closing, closed, opening,
7. Doors obstructed, doors nudging,
8. Car overloaded,
9. Individual board power supply,

All input and output signals shall have LED indicators,

2. Pushes or Switches

Pushes, switches or other suitable means shall be permanently provided on the controller panels in the machine room to allow:

1. Hall call registration.

LED indication shall be provided for calls registered.

3. External Indicators

Provision shall be made for:

1. Hall call acceptance.
2. Call acceptance and half illuminance of landing pushes.

4. Mechanical Counters

A six figure mechanical, non resettable, digital trip counter shall be provided to record the number of journeys for the lift.

5. Event Recorder

The following shall be recorded in the format of time marker, event type, intervals in days since the last identical event, floor number/other relevant data and number of occurrences. It shall be possible to store a minimum of 24 events.

1. Memory fault/self test result,
2. Programme fault,
3. Switch-on reset sequence,
4. Primary safety circuit failure,
5. Door close protection fault,
6. Door open protection fault,

7. Landing door interlock not made up,
9. Car door interlock not made up,
9. Start failure,
10. Door open failure,
11. Lift stopped outside door zone,
12. Hall call failure (no riser power supply),
13. Car call failure (no power supply),
14. Failure to complete journey in "double time",
15. Transfer timer time out,
16. Car overload,
17. Lift alarm operated,
18. Opening of locks when running,
19. LIS signal true,
20. Shutdown after three successive attempts to start,
- 21-24. Provision for four further event types defined by the SO.

Information on additional faults that may be recorded shall be supplied with the tender documents.

The event recorder shall be capable of examination without affecting the normal lift control function or the continued logging of events.

2B.14 Controller: Single Lift Control Logic

1. Controller Function

The control system shall be capable of independently controlling one car.

2. Type of Control

The control of the lift shall be simplex fully collective with automatic powered door operation.

3. Call Acceptance

All call acceptance indicators shall be driven by the computer and the information path is as follows: call registration push pressed-input to computer programme - recognition and acceptance - output by computer to call acceptance indicator.

4. Hall Call Cancellation

The registered hall call shall be cancelled and the hall call push illumination shall be extinguished before or at the stopping of the lift at floor level.

5. Door Reversal

Door reversal shall be achieved by constant pressure being applied to the car or landing door open push.

6. Parking Floor/Sequence

When the lift shall return to the Ground Floor and remain with the doors closed.

7. Maintenance Control

Car top maintenance control is required on the lift.

8. Double Journey Counters

A timer shall be set every time a lift journey is commenced which times out after a duration equal to twice the elapsed time of one full travel journey. The motor shall be switched off and locked out if it continues to run subsequent to the expiry of this elapsed time.

This protection device shall not be operative when the lift is switched to inspection.

9. Adjustment of Timers

Adjustment of all timers shall be possible and their values shall be agreed by the SO.

10. Event Recorder, Supply and Battery Backup

The event recorders shall be provided with a battery back up capable of a minimum of 30 days. This shall be mounted on the printed circuit board.

Alternatively, a limited 8 hour battery back up may be offered on the PCB with an external feed from a battery supply capable of at least 30 days operation.

11. Micro Computer Self Tests

The micro computer shall regularly run diagnostic checks on the memory functions, input and output circuits and run a programme test. Any errors shall be logged in the event recorder.

12. Diagnostic Aids

The controller shall provide diagnostic aids for use in the setting up of the lift to incorporate, but not be limited to:

1. Door times,
2. Call indicator for car and landing,
3. Position and direction indicator.

13. Initialisation

Whenever power is connected to a controller the micro processor shall go through an initialisation routine, clearing all hall call and car call registers and all status registers. Following this zeroing procedure the micro computer shall set all timers to preset default values.

14. Automatic Position Checking

The terminal floors shall be used by the controller to check the correct floor value. Any error found shall automatically cause the lift to travel to the floor level designated for resetting.

15. Stuck Push Protection

The controller shall have the facility to recognise a stuck hall or car push and shall ignore the signal after a pre-determined interval.

16. Programme Examination

The computer programme shall not be accessed, examined or altered within the machine room without the use of special equipment.

17. Overload Indication

Provision shall be made to incorporate a car overload device which shall incorporate a buzzer.

18. Lift "In-Service" Signal

The micro computer will regularly check that the lift is "In Service" and provide an active output signal suitable for connection to a monitoring network. The lift shall be recorded "out of service" should it fail to respond, if the doors fail to close or if the doors are obstructed for a period in excess of 90 seconds even if the lift subsequently continues to be in service.

1. Safety chain broken
2. Alarm operated

19. Interlocks

The door open and door close contactors shall be electrically and mechanically interlocked.

20. Auto Re-start

In the event of a power failure, or whenever the lift is switched off, the controller shall automatically restart on the restoration or re-connection of the power supply and cause the lift to move from its static position.

When the lift encounters a floor with auto position reset, the floor value in the controller shall be reset and normal lift operation shall resume.

2B.15 Controller: Variable Frequency Vector Drive Power System

1. The speed controller shall be mounted within the controller enclosure with all PCBs and terminals easily accessible.
2. The power system shall be variable frequency Vector control, closed loop with feedback from the pump motor supplied by a quadrature bi-phase pulse tacho generator.
3. The regulator shall be a digital drive system that shall control a low slip, single speed a.c. motor by controlling the currents affecting the motor's torque and flux producing components.
4. The regulator components shall accept 3 phase a.c. power, and provide rectified, then inverted, 3 phase a.c. power output controlled by a signal/torque/flux processing section.
5. The regulator shall incorporate a monitor parameter unit to allow values of output current, output frequency, slip frequency, d.c. link voltage, motor speed and torque demand to be monitored in real time. The monitor shall have the facility to access the regulator fault codes to allow on site fault finding.
6. The thyristor bridge shall be adequately rated for maximum current with a PIV not less than 1200V.

7. Floor level accuracy shall be consistent at no load or full load to +/- 6mm.
8. Complete circuit diagrams of drive shall be incorporated in both the machine room schematics and manuals.
9. The slow down of the lift at terminal floors shall be achieved by electronic means.
10. The switching of power by contactor to the hoist motor shall be commutated with the thyristor turn on and turn off.
11. Safety guidelines shall be to the British Standard for VF controllers. Where the power electronics are located on printed circuit cards the removal of any card or charts shall apply the brake if the lift is moving or shall prevent the lift from starting a journey. Use of error tracking during a journey to shut down the lift to a fail-safe condition is acceptable.
12. Re-levelling shall be incorporated.
13. Inspection speed to be 0.3m per second and shall be capable of moving the lift throughout travel on a continuous up and down basis for not less than 30 minutes.
14. The motor of any pressure fan shall be started on motor over-temperature.
15. All relay and contactor coils shall be continuously rated. Neither telephone type relays nor economy resistors with AC contactor coils shall be used.
16. The brake switch incorporated in the winding machine shall cause the pickup current of the brake to be reduced to half value, by inserting an appropriate resistor. The natural response time of the brake shall be decreased by placing a resistor in series with the brake coil, which shall be wound for 100 VDC.

2B.16 Controller: Door Operator

The door operator control circuits shall operate the doors in direct response to the selected car and hall calls and shall provide for the following features:

1. Provision to operate the AC variable frequency door motor from the car top maintenance control at any position in the shaft.
2. The inclusion of circuits to connect to a positively operated switch that shall make up only when the door operator is in the fully closed position. The switch shall be incorporated into the car and landing door lock circuits.
3. If the car or landing door contact fails to make up within 10 seconds after the door close cycle initiation, then a door open cycle shall commence, whether the lift is committed to a journey or not.
4. Operation of the door close protection timer shall cause all car and hall calls to be cancelled.
5. Normal lift service shall be restored when a hall call is registered, thus immediately initiating a door close cycle.

6. Operation of the door detector shall initiate a door open cycle.
7. A door open push shall be provided to provide door reversal.
8. Failure of the lift to start its journey due to the doors being held shall cause the hall call to be cancelled after 40 seconds elapsed time.
9. The door operator logic circuits shall be so arranged that operation is not dependent upon a single or secondary circuit element. Failure of such elements shall not cause the doors to remain in the open condition.
10. Care shall be taken to ensure that all wiring and terminal block positioning associated with the lock circuits and safeties to and from the door operator is such that no possibility of short circuits due to fracture of terminals, moisture, etc., can take place.

2B.17 Rubber Insulating Mats in Pump Room

The Contractor shall provide permanently secured rubber insulating mats to the front of the controller and all switchgear.

The mats shall be full width of the relevant equipment and at least 900mm in depth with each mat rated to insulate against 11kV as a minimum each mat clearly displaying a certifying notice.

Where one side of the rubber mat is fluted or profiled, this shall be laid against the floor where the mat shall be retained within a non-conducting periphery trim should the fitting of the mat potentially create a tripping hazard.

B2.18 Hydraulic System: General

The hydraulic unit shall have VF drive and control with energy accumulation and shall provide low start and run currents, low energy consumption and low heat generation.

The hydraulic system shall comply with the general requirements of BS 5655 and EN 81/2 except that, where these differ from the particular requirements of this specification, the provisions of this specification shall prevail.

The system shall not utilise constant quantity bypass control, but shall deliver only the required amount of oil to achieve the contract speed and shall be quiet running in both directions of travel.

Pressurised vessels, such as the accumulator container, are subject to statutory inspections. The Tenderer shall include for such inspections, tests or examinations during the warranty period to meet the requirements of The Pressure Equipment Regulation 1999 and The Pressure Systems Safety Regulation 2000.

The installation shall be rated for 120 journeys per hour, 60 pump motor starts.

2B.19 Hydraulic System Operation

The hydraulic system shall be designed to utilise the minimum amount of oil displacement corresponding to the designed travel of the lift including terminal floor overtravels.

The drive current required to suit the lift equipment and the carrying capacity at the designed speed and maximum duty rating shall be minimised by use of variable frequency controlled equipment with energy accumulation vessels.

An auxiliary motor and pump arrangement shall assist the start up and drive of the lift in the up direction by using stored energy accumulated during a downward journey. The pressure stored within the system shall be constantly monitored and shall be topped up as required to suit the drive characteristics.

Lift travel shall not be possible until the accumulator is charged to the requisite operating pressure. Fluid by-pass or re-circulation is not acceptable.

The drive shall be constantly monitored to provide a smooth lift ride profile from acceleration up to full contract speed and deceleration down to stopping at floor level within +/- 6mm under any loading condition irrespective of the duty cycle.

The mechanical/electrical/electronic drive/control configuration shall be specific to suit the variable frequency, energy accumulation system.

2B.20 Hydraulic Power Unit with Energy Accumulation

The variable frequency hydraulic system shall incorporate a pressurised energy accumulation vessel.

The top up and drive pumps, pump motors, oil storage tank and the accumulator vessel(s) shall be secured and stabilised with isolation mounts to minimise the transmission of vibration and noise through the building structure.

The tank shall have a minimum overcapacity of 25% for the travel, size of ram and pipe work and shall stand on a steel framed raft in an oil-tight bund or catchment tray capable of holding a maximum oil leak plus 10%. The design of the bund or catchment tray shall not inhibit normal maintenance operations and shall be identified to prevent tripping hazards. The bund or catchment tray shall not obstruct means of draining the tank.

The power unit shall be designed specifically for lift duty and shall operate with the minimum of noise and vibration with alignment of the motor, pump and bearings maintained under all normal operating conditions.

A silencer shall be fitted in the hydraulic system to minimise the transmission of pulsations from the pump to the car, and to reduce the emission of airborne noise to below 45dB at a distance of 1m from the pump casing.

Automatic, thermostatic controlled heaters shall be provided to ensure an even oil temperature and an oil filter shall be fitted on the pump inlet, which shall be simply cleaned or changed without loss of oil.

The accumulator vessels shall be painted in red oxide gloss machine paint, except for any valves, joints or connections to pipes or other information or safety devices.

The accumulator vessels shall have a collar or a traffolyte notice advising as a minimum:

1. Manufacturer,
2. Serial number,
3. Date of manufacture,
4. Standard to which the vessel was built,
5. Maximum allowable pressure
6. Minimum allowable pressure where it is other than atmospheric,
7. The liquid and/or gas contained within,
8. A green 'Compressed Gas' internationally recognised warning diamond, and or / alternative dangerous substance warning sign.

2B.21 Pump Motor

The variable frequency pump motor shall be of a standard design with thermistors embedded in the starter windings to give protection against overheating.

The maximum values of start and run current shall be provided with the tender return and, if requested, Tenderers shall provide the design calculations to support their figures.

Test certificates for 'complete' tests as set out in BS 5000, Part 99, and BS 4999, incorporating additional tests for motor starting torque as a percentage of the full load torque, shall be submitted prior to delivery of the motor to site.

Note: Compliance of the machine and motor with tests of the maker shall not relieve the contractor from the responsibility of providing a machine capable of performing under all normal working conditions and satisfying the additional tests as set out in this specification.

2B.22 Valves

The control valves shall ensure safety of operation and provide electronic closed-loop speed and acceleration control. They shall provide constant rates of acceleration, rated speed and deceleration under all normal conditions of loading and changes in temperature of the hydraulic oil.

2B.23 Levelling Accuracy

The maximum difference in level between any landing and the car floor, after travelling in either direction under no load and rated load conditions and with the stopping adjustment to suit general passenger traffic, shall not exceed +/- 6mm.

For half contract load the lift shall stop level at all entrances and the levelling accuracy shall be demonstrated under these specified conditions during the commissioning and acceptance tests.

2B.24 Cylinders and Rams

The rams shall be direct acting for use with a cantilevered car arrangement, manufactured from steel, of ample diameter for the length, truly machine and polished.

The neck of the cylinder shall incorporate a gland, a wiper ring and means to collect and contain wiped oil in a container that shall be clearly labelled including 'DIRTY OIL - DO NOT REUSE'.

The installation shall be designed such that the cylinder may be readily withdrawn for complete external examination and replaced with the minimum of inconvenience and loss of lift service. The Contractor shall provide lifting beams and fixing points whether a temporary or permanent requirement.

Where bolts and screws are used to secure the ram limit stops, they shall be pinned after final positioning, following the witness and commissioning test.

2B.25 Permanent Pressure Test Port

Both the cylinder side of the valve block outlet and each connection to the cylinder shall incorporate a permanent pressure test port with ball valve control to facilitate undertaking the static overpressure test in accordance with LG10.

2B.26 Rupture Valve

The rupture valve shall be easily accessible, though protected from accidental impact in the lift shaft or lift pit. The rupture valve shall be factory set and sealed to suit the design criteria of the lift.

A low pressure device shall be incorporated in the hydraulic line that shall initiate the closing of the lowering valve in the event of an obstruction preventing the car from descending. The rupture valve shall incorporate a lockable and secure test facility to simulate a burst pipe condition, that shall be located at the main hydraulic tank.

2B.27 Pipes and Hoses

Hydraulic piping and hose shall be mounted on, but isolated from, the building structure to minimise the transmission of vibration and noise, with all hose installed in a manner to avoid twisting, sharp bends and chafing. A shut off valve shall be provided between the control valve and the cylinders.

Hose connections shall be of a type recommended by the hose manufacturer and shall comply with the recommendations of BS 5244. The hose size and design shall meet the requirements of the power rating and the flow rate for the type of oil to be used and the system operating pressures.

2B.28 Anti Creep Device

Independent re-levelling switches shall automatically return the car to floor level at a speed not exceeding 0.15mps in the event of a leakage in the hydraulic system causing the car to descend more than 25mm from floor level.

2B.29 Hydraulic Oil

The hydraulic equipment shall operate on a bio-degradable vegetable based medium as approved by The Environment Agency.

This shall offer, as a minimum, the same operating characteristics, flash point, design life and anti-corrosion properties as that offered by multi-grade mineral oils and operation using standard oil seals, glands etc.

2B.30 Emergency Manual Operation

A bright, steel, manual lowering device for emergency use shall be provided.

A hand pump shall be provided to allow the car to be raised manually. This shall permit a minimum of 0.5m of travel in a period of 60 seconds without excessive manual effort.

Clear and concise instructions for raising and lowering the lift, together with a drawing of the layout and location of the equipment, shall be encapsulated and wall mounted, to be clearly visible from the operating position.

2B.31 Pawl Device

Pawl devices shall be provided to the underside of the car sling. The buffer stroke shall be a minimum of 100mm and the device shall incorporate electrical interlocks such that the lift is unable to move on normal operation until the pawl is energised and is only able to move in the up direction when the buffer is fully compressed.

Pawls shall be fitted to the guide rail at each floor with the pawl at the Ground floor being positioned such that the pawl will engage even in the energised position. A further pawl shall be fitted a reasonable distance above the Ground floor to enable a pit prop equivalent facility.

The pawl device shall therefore fulfil the following functions:

1. Safety device 50mm below each of the upper floors.
2. Energy dissipation buffers.
3. Pit prop equivalent enabled without entering the shaft.

2B.32 Isolation

The completed lift installation shall be designed to ensure quiet operation and sound isolation shall be provided to reduce the transmission of any noise or vibration to the building fabric and structure.

Isolation shall be positioned between both the pump unit raft and the energy accumulator unit and the pump room floor.

2B.33 Hand Operation Floor Zone Indicator

Provision shall be made in the machine room for indicating the position of the lift car with respect to each landing when hand-lowering or raising is being undertaken by authorised personnel. This shall only be operative when the power supply is switched off and the lock circuit shall not be used to provide the feature.

The Contractor shall provide an automatic and self-contained charger unit to supply both the handwinding position indicator and the buzzer assembly which, in the event of supply failure, shall be maintained by the unit for a minimum of three hours.

The position indicator and buzzer shall operate when the car floor is no more than 25mm from the landing level. The unit shall be clearly visible and audible from the machine and shall be operated by a switch mounted on the front of the controller enclosure.

Durable, clear and precise instructions, encapsulated in plastic, on the use of the above together with the emergency release procedure shall be fixed on the wall adjacent to the machine and to the controller.

2B.34 Auxiliary Stop Switch

The switch shall be of the metal clad, double-pole, bi-stable two way type, totally enclosed and readily accessible adjacent to the pump room. When the switch is thrown to the 'STOP' position it shall cause the lift to stop and prevent the lift being started until the switch is returned to the 'RUN' position.

2B.35 Guides and Guide Brackets

The Contractor shall ensure that the cross section of the cantilever 'T' section guide system and steady guide and the rail bracket spacing are calculated for the size and weight of the lift car plus load. A copy of the calculations shall be submitted to the SO for approval within three weeks of contract award.

The Contractor shall plumb and mark out the shaft to suit the fixings required for the guide brackets in accordance with the drawings and in so doing shall then drill for and provide all anchorages by means of chemical fixings.

All guiding surfaces are to be machined and polished and each length of guide shall have male and female connection joints at alternate ends, with the guides connected by steel fish plates. There shall be sufficient length of guide to ensure that no part of the car guide shoe assemblies can run beyond the top section.

The Contractor shall plumb and bone the guides to ensure that they are vertically aligned, and shall advise the preferred method with the tender return.

Tram lining is not acceptable, and the Contractor shall leave the boning lines in place for witness inspection by the SO.

The guides shall be secured to channel steels in the lift pit and all guides, sole plates and fixings shall withstand the force imposed when the rupture valve operates under full contract load in the event of oil loss.

Removable containers shall be provided in the lift pit to collect excess guide oil.

2B.36 Guide Shoes

The guide shoes shall have a minimum length of 175mm and shall have liners easily replaced in the event of wear.

2B.37 Pit Ladder

A galvanised, flat tread, mild steel ladder with handholds shall be provided to give ease of access to the lift pit in a position and to a design, and, to be agreed with the SO.

2B.38 Pit Stop Switch and Shaft Access

The two pit switches shall be of the metal clad, double-pole, bi-stable two way type, totally enclosed and positioned away from the lift car. When a switch is thrown to the 'STOP' position it shall cause the lift to stop and prevent the lift being started until returned to the 'RUN' position.

One switch shall be readily accessible from the lowest level served at 1.3m above the landing and a maximum of 1.0m from the landing entrance and the other shall be 1.0m above the pit floor.

2B.39 Limit Switches

The terminal, slowing, stopping and final limit switches shall be complete with all necessary fabricated brackets which shall be pinned after final positioning.

2B.40 Car Sling and Platform

The car sling and platform shall be fabricated from rolled steel channel uprights and cross sections and shall be so reinforced and braced as to sustain a fully loaded car without permanent deformation during normal operating conditions, operation of the safety gear or in the event of impact with the buffers.

The guide shoes shall be mounted on plates secured to the horizontal sling members. The platform and car enclosure shall be fully isolated from the sling by means of rubber mountings with restraints.

2B.41 Car Sub-Floor

The sub-floor shall be cut from a single piece of flame retardant Marine Ply to BS 1066 requirements and shall have a minimum depth of 25mm and be secured to the structural platform members. A 16 gauge zintec steel sheet shall be fixed to the underside of the sub-floor.

The floor shall be so constructed as to withstand deformation under normal operating conditions or on operation of the safety gear and in the event of impact with the buffers, fracturing or loosening of the applied car flooring shall not occur.

2B.42 Crown Bar Records

The Contractor shall provide and fix an engraved 10 swg brass notice, flush filled with white epoxy resin, to the crown bar of the car sling. Numerical detail shall be metric and the label shall detail the following information:-

1. Makers Name and Lift Number
2. Client Identification and/or Number
3. Total Car and Sling Weight
4. Contract Load and Speed

2B.43 Car Top Maintenance Control Station

The control station on top of the car shall meet the requirements of BS 7255, shall have the faceplate facing the front of the car and shall incorporate the following features:-

1. A 240 volt, 9 watt, compact fluorescent low energy lamp, that shall be protected against impact by a screw fixed polycarbonate cover, and controlled by a separate switch. The unit shall incorporate emergency lighting.
2. A switched 13 amp socket outlet to BS 1363 incorporating a residual current tripping device of 30 milliamps.

Items 1. and 2. shall have a common supply.

3. A metal clad bi-stable stop switch and with this switch in the stop position it shall not be possible to move the car from any control position. The stop switch shall be readily accessible from the landing when the car roof is positioned 1 metre above the landing threshold.
4. An "UP" and "DOWN" and a common constant pressure push, clearly marked, this push being sited between and adjacent to the "UP" and the "DOWN" push. The circuitry shall be arranged such that two pushes must be pressed in order for the car to move in either direction.

5. A robust TEST SWITCH, with the "TEST" and "NORMAL" positions clearly engraved.

With the switch in the "NORMAL" position, the lift shall respond to landing and car calls. With the switch in the "TEST" position, the "UP" and "DOWN" and common constant pressure pushes on the car top control station shall become operative, subject to the following conditions:-

1. It shall not then be possible to control the car from any other position.
 2. The car shall travel at a speed not exceeding 0.3m p.s.
 3. The car shall not move until all safety devices are made and remain in the safe position.
 4. The car shall move only while the respective direction and common push are both depressed.
 5. A terminal limit switch, associated with this control, shall, when the car is moving upwards, stop the car so that there is a free distance above the maintenance platform area of at least 1.8 m. A white paxoline notice shall be screw fixed to the cover of the limit engraved with the words "MAINTENANCE LIMIT" in red lettering.
 6. A door operating switch which shall have its "DOOR OPEN" and "DOOR CLOSE" positions clearly engraved. This switch shall operate the selected doors but only while the car is stationary with the TEST SWITCH in the "TEST" position.
6. The control station shall be so positioned and designed that it does not inhibit safe use and to prevent accidental operation.

2B.44 Car Top and Car Bottom Clearance

Where the pit depth is less than that required to provide the 600mm clearance required by BS 5655, then the bottom run-by of the car when at floor level shall be reduced to 150mm in order to maximise the car bottom clearance.

If the configuration of the machine slab and support steels does not satisfy the requirements for car top clearance required by BS 5655, then a warning notice stating "REDUCED HEADROOM" shall be provided.

2B.45 Lift Car: Floor Covering

The floor covering shall be 6mm tactile rubber sheet having a continuous 35mm radius return on a solid core to the car skirting.

2B.46 Lift Car: Sill

The car sill shall be 4mm minimum section extruded manganese bronze, having self cleaning slots and shall be secured by brass countersunk set screws with self-locking nuts. The sill and the rolled steel sill support angle shall cover the full width of the door drive so that each set of door shoes are retained throughout the driven distances. Over the car entrance width, the horizontal distance between the car sill and each landing sill shall be no more than 30mm.

2B.47 Lift Car: Toe Guard

The height of the vertical portion shall be as near as possible to 750mm, subject to the requirement that there shall not be less than 100mm clearance between the bottom of the toe guard and the pit floor when the car rests on fully compressed buffers.

The toe guard shall be fabricated in 1.6mm zintec, supported by a horizontally and vertically braced mild steel frame attached to the car platform steelwork, and fixed at no more than 150mm centres to the car sill by countersunk brass set screws.

The toe guard shall extend to 100mm beyond the clear door width on both sides of the entrance.

2B.48 Lift Car: Enclosure

The Contractor shall provide a 600mm x 1200mm montage having two isometric views of the lift car, complete with all finishes.

Stainless Steel

The car walls, ceiling and front return panels plus the car and landing doors and architraves shall be fabricated in 16 gauge 316 grade patterned stainless steel for which the Contractor shall provide a mill certificate to the SO, prior to any fabrication.

Fixings

All nuts, bolts and washers to be used in the construction of the car carcass, platform and sub-floor shall be cadmium-plated and nuts shall be of the self-locking type.

Fixings, of any type, shall not be visible from the car or landings.

Evode Colour Seal shall be applied to form a separation barrier at the abutment of any dissimilar materials, and 3mm of fire resistant, anti-drumming compound shall be used on the shaft side of all wall and ceiling panels.

Wall Panels

The car wall panels shall be fabricated from patterned stainless steel not more than 250mm in width and shall be sufficiently braced and reinforced to withstand anticipated impact from heavy usage such as removals, prams and trollies.

All mating surfaces shall be treated with.

The bottom edge of the car wall panels shall be positioned 75mm above the car sub-floor and shall be bolted through a 16 gauge stainless steel angle trim 9mm in front of the skirting. The whole shall present a continuous flush face to the passenger with each panel fabricated in one piece vertically.

The joints between each of the car wall panels and each of the roof panels shall be separated by recessed 3mm Darvic strips which shall in all instances on the car be prevented from being forcibly pushed into the shaft by a return flange on all wall and ceiling panels.

The design of the car shall allow simple removal and replacement of the panels in the event of damage.

Return

The return shall be 60mm deep and fabricated from patterned stainless steel, reinforced throughout with 14 gauge zintec sheet steel.

Slam Post

The entrance slam post shall be fabricated from stainless steel, reinforced with 14 gauge zintec sheet steel throughout with all loads imposed transmitted to the steel car door entrance frame.

Skirting

The channel skirting shall be 316 grade, 3mm minimum satin finished stainless steel with welded gussets and shall have the bottom flange bolted to the car platform using a plastic membrane between to prevent electrolytic corrosion and chafing.

Handrail

Handrails shall be fabricated from 12 gauge, 316 grade satin finish stainless steel and formed to a 47mm x 25mm oval section with the widest part on the horizontal. The handrails shall fit the rear wall and one side wall of the lift car in one piece with end caps and 90° bend and end cap at the lift entrance.

The free space between the handrails and the car walls shall be 35mm.

The handrails shall be fixed with a minimum of six 90° stainless steel angle brackets, three to the side wall and three to the rear wall, and removal shall be from the lift shaft with fixings 900mm +25/-25mm to centre above the car floor.

Ceiling and Roof

The car ceiling shall be constructed from patterned stainless steel panels not more than 250mm in width and shall be reinforced externally with 14 gauge sheet zintec treated with a non-slip compound.

The design of the roof shall be such that it will adequately support the weight of 150Kg at any point on the roof surface without causing permanent deformation or damage. The working area shall be flat, smooth and without tripping hazards.

Ventilation

Concealed ventilation shall be provided to the car at the top and bottom of the side wall panels. The ventilation shall consist of 10mm diameter clear apertures totalling 1.5% of the total car floor area with robust masking plates to the shaft side of the car. The design of the vents shall be such that it shall not be possible for persons travelling in the car to touch any fixed or moving equipment in the lift shaft by means of inserting objects through the vents.

Car Drapes

The car shall be fitted with solid stainless steel capstan studs and supplied with two sets of padded and quilted, coloured canvas covered drapes to each wall and the return of each design of the lift car. The drapes shall have apertures for access to the car stations and a labelled carrying bag shall be provided for the drapes. A sprung rod with rubber end buffers shall be provided to support the drape at the mirror wall.

Plumbing and Alignment

Adjustments to the car shall be made by packing to the base and not by taking up tolerance on the car top isolation rollers which shall be fitted only after the plumbing and levelling of the completed car and inspection by the SO.

2B.49 Lift Car: Station

The faceplate shall be fabricated from 3mm finished stainless steel fitting flush to the wall panel and supported by stand-off furniture hinges on a metal back box mounted in the side wall, adjacent to the slam post.

The minimum lateral distance to the centre of any push from the return shall be 400mm

The hinged faceplate shall have secret fixings and shall incorporate the car station fixtures. The Contractor shall submit a drawing, for approval by the SO, indicating the incorporation, size and arrangement of the following:

1. TMO Lift Number and Identification - engraved characters, black, 20mm characters.
2. Contract Load in Kgs and Persons - engraved characters, black.
3. Auto Dialling Telephone Unit - engraved instruction, yellow.
4. Floor Pushes.
5. Speech Synthesiser.
6. Car Position and Direction Indicator.

7. Door Open Push.
8. Alarm Push, engraved characters, yellow.
9. Key Operated Fan Switch, engraved characters, black.,
10. No Smoking Notice - engraved characters, red.
11. Emergency Lighting Test Switch with LED indication.
12. Blank plate at Walkway push position. Wiring terminated behind faceplate in connection blocks.
13. Car Preference Key Switch, engraved characters, black.

Unless specified otherwise, all engraved characters shall be 12mm, and flush filled with epoxy resin.

The flat form trailing cables shall run continually from the controller to the car and shall be connected to terminal blocks permanently mounted in the metal back box behind the car station.

The car station fixtures shall be secured by weld studs to the faceplate to enable simple access and replacement of components by authorised personnel.

2B.50 Lift Car: Pushes

All pushes shall meet the requirements of EN81-70 and M2/S2 Building Regulations and shall:

1. Be stainless steel tactile coloured black for the floor and door open pushes, yellow for the alarm push and green for the Ground floor push.
2. Be flush mounted except for the Ground floor push that shall stand proud of the faceplate by 5mm.
3. Incorporate long life LED call acceptance.
4. Be half illuminance at all times with full illuminance to indicate call registered.
5. Remain half illuminance in the event of power failure.
6. Have an audible signal to signify that a call has been registered.
7. Be flame resistant.
8. Have shock loads on the pressel transmitted to the body of the unit and not the contacts.
9. Be of such design as to make the deliberate 'fixing' of the pressels in the depressed position difficult.

10. Have no fixing visible or accessible from the landings or the lift cars.
11. Have the lowest push to the car station positioned at 900mm centre and the highest push at no more than 1200mm centre above the car floor.

2B.51 Lift Car: Load Sensing Device

A load sensing device shall be fitted to the car sling or platform that shall automatically detect a pre-set overload limit of 10% and shall cause a buzzer to sound within the car.

At 80% load, or as determined during commissioning, the device shall activate a landing call by-pass condition causing the lift to respond only to car calls.

The device may be mounted either underneath or on top of the car, but if the latter, the device shall be suitably protected.

2B.52 Lift Car: Alarm Sounder

The alarm sounder system shall be run in conduit or trunking, except for in the travelling cables, and shall consist of 2 x 150mm bells that shall be suitable for a twelve volt d.c. supply.

One bell shall be positioned on top of the lift car and the other shall be housed within a 10 gauge 316 grade stainless steel box fixed to shaft front wall at the Ground floor by means of concealed masonry fixings. The faceplate shall be partially perforated and fixed by means of semi secret fixings to the back box. Pressure on the 'Alarm' push shall ring each of the bells.

2B.53 Lift Car: Voice Synthesiser

The voice synthesiser shall be digital quality and provide for the following messages, each of which shall be easily disabled from the machine room without the requirement to reprogram the unit:-

1. Floor identification,
2. Direction of travel,
3. Doors opening,
4. Doors closing,
5. Lift overloaded,
6. Information for trapped passengers,

The unit is to be located in the machine room and shall supply a matched high quality speaker unit in the car station with a switched duplicate speaker which shall be provided in the machine room for testing purposes. Volume adjustment is required to adjust for site conditions.

2B.54 Lift Car: Hands Free Auto Dialling System

Pressure on the 'Alarm' push shall also instantaneously activate the hands free auto dialling system that shall be capable of dialling a minimum of three separate locations, automatically progressing to the next number if engaged or unobtainable.

The unit shall have the facility to receive calls and shall incorporate an inductive loop and have the further facility to cancel on operation of the door open push and after a preset time interval. The autodialling system shall incorporate communications from the lift pit, car top and machine room.

A yellow illuminated pictogram in addition to the audible signal for the emergency alarm transmission shall indicate that the alarm push has been used and a green illuminated pictogram in addition to the audible signal normally required by voice link shall indicate that the emergency call / alarm has been registered.

On activation, the autodialler shall announce a concise message, whether within the lift car, in the lift pit or on the car roof. The message shall confirm that the emergency communication system has been operated, that contact is being made and a request to be patient whilst being connected. The message shall repeat after a short period until the call is acknowledged.

On connection, the recipient of an emergency call from the autodialler shall also receive a concise message, confirming the lift number or reference and that the emergency alarm has been activated.

An emergency call shall be terminated by the call automatically timing out. The duration of an emergency call shall be set at 4 minutes but this may be extended if required by pressing the alarm push again. The last 30 seconds of a call shall be identified so that the call may be extended without loss of the facility.

Two-way communication with the activated alarm station whether in the lift car, pit, or car top shall commence only after the call has been acknowledged.

The system shall allow for the lift car, pit or car top emergency communication station to be called from any external mobile or landline telephone point but such calls shall not be connected if the emergency autodialling system is in operation. The destination for calls made externally shall be determined from the caller's handset, and these calls shall be announced by a concise message, prior to allowing hands free, two-way communication from the lift or shaft.

The cabling shall be terminated in the machine room for final connection by others.

Clear, concise instructions shall be engraved in the car station in 12mm characters, flush filled with epoxy resin.

2B.55 Lift Car: Lighting

1. The lift car shall have two vandal resistant light fitting enclosures which shall be approximately 700mm long and 250mm wide.

2. The light fitting enclosures shall be manufactured from mild steel, have ventilation slots to the sides and shall be reinforced and braced to withstand a load of 75kg with the whole assembly that shall be supported on the car roof by means of mild steel angle to all four sides.
3. The interior of the enclosures shall be cellulosed white and the whole assembly shall mount flush on the car ceiling.
4. The diffusers shall consist of two layers of shock and impact resistant polycarbonate sheet, the upper layer 3mm opal and the lower layer 10mm clear. The diffuser shall be secured on each side by means of mild steel angle affixed to the enclosure, all to be contained within 1 2.5mm stainless steel frame.
5. In the light fitting enclosures the gap between the bottom of the lamps and the uppermost part of the diffuser shall be nominally 25mm. The complete enclosure assembly shall be made readily removable from the top of the car to ensure ease of access for maintenance of the fittings. To facilitate this, the enclosure shall be secured to the car top by wing nut fixings of 5mm minimum diameter or other similar arrangements.
6. Each enclosure shall contain two 18 Watt x 600mm fluorescent tube fittings each separately controlled to maintain illumination in the event of one fitting ceasing to operate. The lighting shall achieve 200 lux at floor level. One tube in each of the enclosure shall incorporate the emergency lighting system.
7. A key switch shall be incorporated in the car station in order that the emergency car lights may be tested without disconnecting the normal lighting supply. The LED indicator in the car station shall visibly signify that the emergency lighting unit is fully charged.
8. The car light supply shall be separate from the car top lighting and power and a 2 Amp cartridge fuse and terminal block shall be fitted within the enclosure.

2B.56 Lift Car: Emergency Lighting and Alarm Supply

The battery and charging unit for the car emergency lighting shall be fixed on top of the lift car, in a position that does not create a safety hazard and with the wiring run in trunking and/or conduit.

The battery shall power the car emergency lighting and the alarm signal system and shall have the capacity to maintain each for a period of at least 3 hours and, on restoration of the mains supply, the battery shall fully re-charge, automatically, within 24 hours.

The battery shall additionally power the background illumination to all lift car pushes and all position indicators for the same 3 hour period.

The battery shall be fed from the live side of the car light switch in the machine room.

The supply to the luminaires shall be provided via a key operated switch which, on operation, shall disconnect the supply, simulating mains failure for testing purposes.

2B.57 Lift Car: Forced Ventilation

Forced ventilation shall be achieved by means of a protected, silent running exhaust fan unit mounted on the car roof. Ducting shall be provided to encompass a number of the concealed vents in the rear wall of the car. The position of the fan unit shall be agreed by the SO.

The fan shall be activated by a key switch in the car station which, when in the 'OFF' position shall automatically become operable upon activation of the alarm push for an adjustable time period of up to three hours.

2B.58 Automatic Power Door Operator

The automatic door operator shall meet the following:-

1. It shall be driven by a variable frequency AC motor in both opening and closing directions. The motor shall be totally enclosed and rated for its anticipated duty cycle.
2. The door speed during operation, shall have sinusoidal characteristics.
3. When the car top control is set to test with the car not at landing position it shall be possible to test, from the car top control station, the functioning of the door operator without operation of any other lift equipment and without damage to any equipment.
4. With the exception of 3. above, the car door and associated landing doors shall operate simultaneously and only with the car stationary at a landing.
5. In the event of a power failure and with the car at any landing level, it shall be possible to manually open both the car door and associated landing door, from the landing concerned, with the use of a release key.
6. The operator shall incorporate provision for simple adjustment of door speeds and shall provide the following:
 1. Fast opening speed
 2. Slow closing speed with a check prior to impact.
7. It shall effect mechanical locking of the car door between floor zones.
8. In the event of failure of the lock circuit while the car is in travel, the car door shall not be opened or partially opened by the door operator or by any other means.
9. The lift shall normally park with its doors closed.
10. It shall stop, reverse and fully re-open the car door and its associated landing door if the electronic detector is obstructed while the doors are closing.

11. A 'DOOR OPEN' push shall be provided in the car which shall only operate while the car is stationary at a landing.

2B.59 Passenger Protection

The car doors shall be fitted with a full height multi-beam electronic detector. The detector shall be so arranged that should an obstruction be present whilst the door is closing it shall cause both car and landing doors to stop and initiate a door re-open cycle. The device shall not inhibit the full clear opening.

The detector flex shall be concealed and secured so as to prevent movement against other equipment and in the event of circuit or other failure for whatever reason the lift shall fail safe.

2B.60 Car and Landing Doors

The car and landing doors shall be horizontally sliding having a minimum clear opening as stated in Scope of the Works and the doors shall:

1. Have the car and landing doors fabricated from a different patterned stainless steel to that utilised on the lift car and landing architraves to ensure an alternative textured finish.
2. Be located in the bottom of each door sill by two water and acid resistant, rigid nylon sliding shoes each having a minimum length of 100mm and secured to the well side of the door by a 2.5mm mild steel bracket with three non adjustable fixings such that the shoes may be replaced easily, without lifting the door.
3. Between each sliding shoe a similar flange with five non adjustable fixings shall support a 150mm long 10 gauge mild steel kick plate that shall penetrate the bottom track by not less than 6mm.

Alternatively the kick plate may form part of the structural component of the door, projecting internally 100mm.

4. Have the vertical clearance between the doors and the sill not exceeding 5mm.
5. Have the horizontal clearance between the doors, door return and architrave not exceeding 5mm.
6. Be suspended from hangers fitted with rollers which run above the top track and have eccentric rollers fitted below the top tracks to stabilise the doors. The rollers shall rotate on roller bearings or similar with 'sealed for life' lubrication.
7. Have hangers and sill shoes that shall be supported by an 8mm thick steel plate fixed at the head and foot of the door. Door hanger fixings shall have a minimum of 15mm thread penetration and a maximum of 5mm shimming.
8. Be fabricated in 16 swg zintec sheet steel, being of hollow construction with internal stiffening sections and faced with patterned stainless steel.

9. Have 16swg patterned stainless steel sight guards to the landing doors, formed in one piece with the landing face of the door and braced over the entire height, returning to the shaft side of the door and pinned with a maximum spacing of 100mm.
10. Have the fixing of associated door equipment to the car and landing doors by means of set screws and bolts with the appropriate shake-proof washers to steel plates specifically fabricated within or on the door construction for the purpose. P.K., Pop rivet or riv-nuts are not acceptable.
11. Be provided with spring closers to ensure automatic closing of each landing door panel when the car is outside the unlocking zone. The closer shall consist of a substantial mild steel arm fixed to the landing sill and shall have a positive spring loaded action.
12. Have a mechanical and electrical interlock to each landing door panel. The locks shall have a clear, toughened, removable plastic cover, sealed to prevent possible ingress of water whilst allowing visible and easy adjustment without the use of special equipment.
13. Have the mechanical and electrical interlock of such design and positioning that interference of the lock or its operation shall not be possible other than by an authorised person.
14. Have the mechanical and electrical interlock pinned after final positioning.
15. Have no fixings visible or accessible from the landings or within the car.
16. Have the landing doors so constructed that when in the locked position, they shall withstand, without permanent deformation, a force of 300N applied at right angle to any point on the landing face, uniformly distributed over an area of 5 sq. centimetres. The doors shall operate satisfactorily after such a test.

2B.61 Emergency Unlocking of Landing Doors

It shall be possible for an authorised person to open each landing door irrespective of the position of the lift car. Opening shall be by means of a drop key unlocking release in the door panel, complete with baffle plate.

2B.62 Landing Door Frames and Architraves

1. The landing entrance steelwork uprights shall be fabricated from rolled steel sections.
2. The header section shall be fabricated from 6mm flat steel plate, pre-drilled to suit the uprights and track assembly.
3. All landing entrances shall be located within a recess in the landing floor slab and the Contractor shall make provision to fix the threshold steelwork to the structural floor by means of bracketry and concrete anchors prior to the final building in and screeding by others.

4. The Contractor shall make provision for fixing the landing architraves to the entrance steelwork and shaft fabric. The fixings shall not be accessible or visible from the landing or the car.
5. The architraves shall be of Stonehenge design fabricated in patterned stainless steel to the full depth of the shaft wall having a 60mm to 100mm tapered face to the vertical section and a flat 100mm to the horizontal section. The architraves shall be recessed 6mm into the front wall of the landing and shall project from the front wall finish by 20mm.
6. The architraves shall be fabricated in three sections and shall be of bolted construction, the lower section projecting 25mm below floor level to be built in.
7. The rear return of each architrave shall be wide enough to eliminate any finger traps.
8. The 25 mm deep recess for the doors to close into shall be fitted with 3mm buffers, fitted 100mm from the top and bottom of the doors.
9. Adjustable rubber buffers shall be fitted to the entrance steelwork to prevent the landing doors from opening more than 3mm beyond the clear opening width. The buffers shall be fitted 100mm from the top and bottom of the doors.
10. The architrave header at the Ground and First Floors shall be engraved LIFT HO:..... in 40mm high characters, flush filled with epoxy resin.
11. The architrave shall have reinforced webs for additional strength and for binding during the back filling builders work.

2B.63 Landing Sills

The landing sills shall be 4 mm minimum section, extruded manganese bronze having self cleaning slots and shall be secured by brass countersunk set screws with self locking nuts. The sill and any support steelwork shall cover the full width of the door drive so that each set of door shoes are retained throughout the driven distances.

2B.64 Landing Fascias

Landing fascias shall be fabricated from 16 swg zintec steel sheet and shall extend from each entrance header section to the sill at the next level served and shall be the width of the entrance plus 100mm to each side. The fascias shall be stencilled with the appropriate floor designation in 50mm high characters below each sill

The fascias shall be reinforced and braced as necessary to restrict deflection to 5mm and shall be secured by countersunk set screws at 100mm centres.

Fascias shall also be fitted below the lowest and above the last entrance served, returning to the walls and at no point in the shaft shall the fascias exceed 30mm from the car sills.

2B.65 Landing Stations

The existing back box to the landing station shall be retained and modified to suit the Contractors provision of an extended faceplate that shall be of sufficient length to conceal the back box aperture and to accommodate the landing pushes at a compliant height of 1000mm centres above floor level.

The extended faceplate shall be angle edged, projecting 30mm from the wall shall be fabricated in 16 gauge satin stainless steel.

The faceplate shall be secured by means of extended 6mm stud welds and nuts located on the shaft side.

The landing station shall incorporate the following:

1. Up and down call pushes,
2. Floor number engraved 40mm high characters infilled black.

The walkway station shall comprise a traditional zintec back box plus 3mm stainless steel faceplates secured by means of furniture hinges plus semi secret fixings.

2B.66 Landing Pushes

All pushes shall meet the requirements of EN81-70 and M2/S2 Building Regulations, shall be flush mounted and shall:

1. Be stainless steel tactile with colour contrast.
2. Incorporate long life LED call acceptance indicators.
3. Be half illuminance at all times with full illuminance to indicate that a call has been registered.
4. Have an audible signal to signify that a call has been registered.
5. Be flame resistant.
6. Have shock loads on the pressel transmitted to the body of the unit and not the contacts.
7. Be of such design as to make the deliberate 'fixing' of the pressels in the depressed position difficult.
8. Have no fixings visible or accessible from the landings or the lift cars.
9. Have all pushes positioned between 900mm and 1100mm from finished landing floor level.

2B.67 Landing Position Indicator

The landing position indicator shall be enclosed at each floor by a 16 gauge satin stainless steel box and faceplate with fixings identical to those described in Clause 2.66, at a height of 1800mm centre from finished floor level. The faceplate shall be canted to provide maximum field of vision.

1. Each landing shall have a position indicator to the same specification as that provided to the car but shall also incorporate hall lantern features.
2. When the lift is due to arrive at the pre-determined floor the LED direction indicator will light to notify the continuing direction of car travel and the audible signal shall announce imminent arrival. The visible indicator shall be maintained until the doors have closed.
3. The audible signal to activate 5 seconds prior to lift arrival, with 1 signal for UP and 2 signals for DOWN. The signal tone shall be agreed with the SO.

2B.68 Out of Service Indicator

In the event of the lift ceasing to provide service through, malfunction or supply failure, each position indicator shall scroll "LIFT OUT OF SERVICE". The Sub Contractor shall provide the necessary emergency supply to enable this feature to function for 12 hours continuous operation.

2B.69 Notices, Labels and Instructions

Unless specified otherwise, all notices and labels shall be engraved on white-red-white paxolene and all shall be securely fixed with screws. All characters shall be of similar style and in capitals.

Adhesive fixing is not acceptable.

In addition to the notices and labels otherwise specified within Part 2 and Clause 3.29, the following notices and labels shall be provided:-

1. To identify all miscellaneous electrical switches within the machine room and shaft including the main isolator and consumer unit fuses.
2. To the controller door advising the clients lift number of the live condition of the equipment.
3. To identify all run/stop switches.
4. A 240mm x 170mm paxoline notice to the lift machine room door stating:

DANGER

UNAUTHORISED ACCESS PROHIBITED
DOOR TO BE KEPT LOCKED

The word "DANGER" shall be red and all other wording shall be black.

The following shall also to be provided:-

5. Encapsulated, fully detailed and illustrated, hand raising / lowering and emergency release instructions.
6. Encapsulated electric shock notice in accordance with the current IEE Regulations to the machine room.
7. Encapsulated electrical and operational drawings, wall mounted within the machine room, using swivel type brackets.
8. Tool rack to accommodate the landing door drop release key and safety harness. Each component shall be clearly identified by permanent labels on a shadow board arrangement.
9. Service Log Card and Planned Maintenance Programme.
10. Plastic ring binder with divisions for copies of work sheets, LG1 certification, Statutory Inspection PAS 54, rope and beam test certificates.

2B.70 Guarding

The complete lift installation shall be guarded as necessary to meet the requirements of BS 7255 to ensure the safety of all personnel using, inspecting or maintaining the lift equipment.

The Contractor shall provide two fixed harness points to the car sling and a tubular barrier rail with 25mm weld mesh sides to the car top to prevent inadvertent movement into the counterweight and void areas.

A 150mm high zintec skirting shall be fitted to the edges of the car roof.

The design of all guarding shall be agreed by the SO.

2B.71 Painting and Cellulosing

Paint selection shall be approved by the SO and COSHH certificates shall be provided 7 working days in advance of proposed works and in all cases the full requirements of the COSHH certificate are to be implemented to the satisfaction of the SO.

All fabricated and structural iron and steel parts of the lift equipment, but excluding specially finished surfaces, shall be cleaned, wire brushed where necessary, descaled, properly prepared and primed with a zinc-phosphate primer and finished with good quality lead free enamel semi-gloss paint prior to delivery.

All iron and steel rotating parts of the lift equipment, counterweights etc, shall be painted yellow to BS 10E53 in accordance with BS 7255.

Over the whole width of the top edge of the car toe guard the Contractor shall paint alternate 75mm black / yellow stripes at an angle of 45° to the horizontal and to a depth of 150mm.

To the whole 'refuge' areas on the car top and in the lift pit the Contractor shall paint alternate 75mm black / yellow stripes at an angle of 45° to the landing sill.

To all lifting beams and support steels the Contractor shall paint alternate 75mm black / yellow stripes at an angle of 45° to the horizontal.

All fixed guards shall be painted safety orange.

The shaft side of the car and landing doors plus the fascias shall be cellulosed matt black prior to delivery.

Preparation for on site cellulosing maybe undertaken in normal operational hours but all spraying shall be undertaken at nights or weekends.

No on site painting or cellulosing shall be undertaken without 72 hours prior written agreement from the SO.

2B.72 Tests on Completion and Handing Over

After installation of the lift has been completed, the Contractor shall, in the presence of the SO carry out the tests and examinations set out in EN 81-PAS 32, together with any further dynamic or other tests required by the SO to ensure that the installation complies with the specification.

The SO shall not attend site to undertake any witness or commissioning tests until receipt of the Contractors test document and items list, with all items clearly identified as being complete and signed off as witnessed by the Contractors supervisor or project manager.

The SO shall allocate one working day for witness and commissioning tests for the lift. Any additional visits shall be charged as a set off against the contract and the defects liability period shall not be deemed to have commenced until all outstanding works have been completed to the SO's approval, notwithstanding the penultimate paragraph of Clause 2.09.

The Contractor shall provide all test weights, thermometers, test equipment, light meters and special instruments, all with current calibration certificates, and personnel required for this purpose and shall provide the appropriate Certificate of Test and Examination duly completed together with any other necessary Certificates that have requested previously.

In addition to the testing requirements of EN 81-PAS 32 the Contractor shall include for the following supplementary tests:-

1. Load tests by carrying the contract load throughout the travel and at the contract speed for continuous series of consecutive trips aggregating to a period of 30 minutes on mains supply.

During these tests, the motor and controller shall be checked for excessive temperature rise. Checks shall also be made to ensure that the contract speed is maintained and that the levelling limits are not exceeded under no-load conditions and under selected conditions of load.

2. Setting of the main circuit breaker trips in relation to the stalling current and overload.
3. Tests to record compliant closing forces on doors.
4. System and motor current readings under full load, balanced load and empty car conditions.

2B.73 Maintenance and Remedy of Defects

The Contractor shall assume responsibility for maintaining all lifts in accordance with this clause from the date of site possession.

The Contractor shall warrant and maintain the lifts from handover throughout the defects liability period which shall extend from site possession of the first lift, to twelve calendar months from the date of issue of the relevant Acceptance Certificate by the Contractor on Practical Completion of the final lift.

Maintenance to the refurbished lifts shall be undertaken twice each month for the first three months and monthly thereafter.

The lift pit, pump room and all parts of the walls and floor adjacent to the lift equipment shall be kept clean and clear of oil, grease and rubbish and the Contractor shall immediately renew any defective lamps, tubes and indicators including car, access, machine room and shaft lighting.

The maintenance shall include all cleaning, oiling, greasing, and adjustments of all appropriate parts of the lift installation to ensure satisfactory operation, with adjustments made as necessary to maintain the levelling accuracy of the car to within plus or minus 6mm. A steel oil storage cabinet shall be provided for the pump room.

A safety barrier is to be used at all times access is required to the lift shaft and this shall be supplied by the Contractor and left on site. The barrier shall not be left unattended when the landing doors are open.

A report on the condition of the lift inspected shall be forwarded to The Royal Borough of Kensington & Chelsea within ten working days of the date of inspection and the report shall:-

1. Relate to only that lift.
2. State clearly the work done and adjustments required/made.
3. Indicate any lamps or indicators replaced
4. Certify that the lift is or is not in a satisfactory and serviceable condition.

5. Give details of any breakdown since the previous inspection.

During the extended defects liability and maintenance period, the Contractor shall, at his own expense, make good any defective, badly worn or weakened parts resulting from incorrect design, poor workmanship or faulty material.

The Contractor shall undertake any LG1 inspections and certification which may become due during the specified maintenance period.

The Tenderer shall operate and include for a 24 hour emergency breakdown service and shall attend to call-outs during normal working hours within 2 hours of reporting of the call.

In the event of a trap call the Contractor shall ensure that the equipment is rendered safe and that any trapped passengers are released within 30 minutes of the call being received. The Contractor shall make such necessary arrangements as required i.e. use of qualified local Contractor, to ensure that the 30 minutes release for trap release is maintained under all circumstances.

During the defects liability and warranty period the Contractor must be prepared, if and when required, to make nightly and weekend visits in cases of emergency and shall provide the telephone numbers to be used for these call-outs.

Attendance to lift breakdowns resulting from accidental damage, mis-use, vandalism and equipment failures not due to default on the part of the Contractor or his agents shall be paid for against a separate direct order to be issued by the SO.

The Contractor shall allow for one day's training of The Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd staff in usage and emergency release operation.

2B.74 Witness Inspection Points

Witness Inspection Points are to be available to the SO with a minimum of 3 days notice by the Contractor:

1. Witness inspection of the lift controller under test at the Contractor's Works.
2. Witness inspection of lift car with doors and operator fitted at Contractor's Works.
3. Witness inspection of site readiness.
4. Witness inspection of guide rails with alignment equipment still in position.
5. Witness inspection of machine room after fixing positions of controllers, machines etc.
6. Witness inspection of car, sling, counterweight and diverters and alignment.
7. Witness inspection of main roping and compensation arrangements.

8. Witness inspection of safety gear and all pit equipment.
9. Witness inspection of compensation and governor ropes.
10. Witness inspection of entrance frames and sills prior to building in.
11. Witness inspection of hangers, tracks, doors, closers and locks complete.
12. Witness inspection of architraves, prior to building in.
13. Witness inspection of tubed and trunked lift car, complete with doors and operator.
14. Witness inspection of trailing flexes hung and connected.
15. Witness inspection of shaft and landing equipment, installed and wired.
16. Witness inspection of machine room trunking and conduits, etc. before floor screed is laid.
17. Witness inspection of wired electrical equipment in the machine room.
18. Witness inspection of cleaned down shaft, painting, screens, builders work and lift ready for test.
19. Witness inspection of commissioning tests.
20. Witness inspection of items complete and handover.

The Tenderer shall allow and include for all SO attendances and costs for off site witness tests.

PART THREE A

ELECTRICAL SPECIFICATION

TWO ELECTRIC PASSENGER LIFTS, HO90&91

INDEX - PART THREE
ELECTRICAL SPECIFICATION

SPECIFICATION OF THE WORKS

Clause No.	Title	Page No.
3A.01	General	3A/1
3A.02	Temporary Electrical Installation	3A/1
3A.03	Existing Electrical Supplies	3A/1
3A.04	Main Isolators	3A/2
3A.05	Lift Machine Room Auxiliary Supplies	3A/2
3A.06	Machine Room Lighting	3A/2
3A.07	Shaft Lighting	3A/2
3A.08	Socket Outlets	3A/3
3A.09	Car Lighting and Car Top Maintenance Control	3A/3
3A.10	Machine Room Heating	3A/3
3A.11	CCTV - In Car Security Cameras	3A/3
3A.12	Cooling	3A/3

PART THREE A

ELECTRICAL WORK - TWO ELECTRIC PASSENGER LIFTS, HO90&91

3A.01 General

The physical location of all equipment shall be agreed with the SO prior to any site installation work and all existing supplies, switchgear, conduits or trunking shall be removed where not compliant with the requirements of the specification.

All wiring shall be classified as low smoke and zero halogen.

All work necessary to provide a fully operational installation, compliant with all current standards and legislation including equipotential bonding of all exposed metalwork, shall be included.

The electrical works shall be undertaken by an NICEIC qualified electrician and a copy of all electrical test sheets shall be included in the Operation and Maintenance Manual.

The complete electrical installation shall meet the requirements of the specification.

3A.02 Temporary Electrical Installation

The Contractor shall provide all temporary lighting, low voltage power supplies and temporary supplies to drive the lift machine from existing supply points during the works in accordance with Health and Safety requirements.

The use of temporary supplies to drive the lift machine during the works shall be limited to as short duration as possible and shall comply with IEE electrical regulations and requirements.

Temporary site lighting shall be 110volt supplied with a centre tapped transformer with 100watt tungsten bulb light fittings positioned at 3m intervals. Each light fitting shall be protected to prevent accidental damage and arcing against conductive parts if broken.

Durable and environmentally protected 110volt power sockets and plugs shall be provided at 3m intervals.

Temporary lighting and power cables including extension leads shall be considerably used/located and cable tied to temporary works ie: hoardings, scaffolding or the building fabric, to prevent tripping and guillotine hazards or snagging points occurring.

Wherever possible all electrical provisions shall be sourced from any new supplies, provided and fused switches and sockets as further specified.

3A.03 Existing Electrical Supplies

The three phase supply to the lift may be retained if suited to the new conditions. The Tenderer shall confirm suitability in his tender return.

3A.04 Main Isolators

A lockable 80A TPN fuse switch and a lockable 63A SPN fuse switch shall be provided for the lift controller and the consumer unit respectively.

All electrical works detailed below shall be undertaken by the Contractor.

3A.05 Lift Machine Room Auxiliary Supplies

A 12 way consumer unit shall be provided in the machine room adjacent to the 63A SPN fuse switch. The consumer unit shall incorporate miniature circuit breakers, to BS 3871, Type 2, to provide 240V a.c. single phase supplies as follows:

- | | | |
|----------|--|------------------|
| 1. | Machine room lighting | - 6 Amps rating |
| 2. | Machine room heating | - 20 Amps rating |
| 3. | Power sockets | - 20 Amps rating |
| 4 & 5. | Shaft lighting per lift | - 6 Amps rating |
| 6 & 7. | Car light supply per lift | - 6 Amps rating |
| 8 & 9. | Car top maintenance control, lighting and power per lift | - 20 Amps rating |
| 10 & 11. | Autodialler per lift | - 6 Amps rating |
| 12. | 1 spare ways | - Blanked off |

3A.06 Machine Room Lighting

Four twin 1850mm - 70W fluorescent fittings with polycarbonate diffusers shall be positioned over the controller, machine and access areas to provide 200 lux illumination at floor level. An additional fitting to the same specification shall be provided within the roof access corridor.

The light switch shall be located adjacent to the machine room access door and the supply to the luminaires shall be provided via a key operated switch with LED indication which, on operation, shall disconnect the supply, simulating mains failure for testing purposes.

Emergency luminaires shall be provided within each fluorescent fitting, each of an 8 watt fluorescent type, non-maintained.

3A.07 Shaft Lighting

Shaft lighting shall consist of 600mm twin fluorescent fittings with 3mm polycarbonate diffusers having screw fixings. One fitting shall be provided 500mm from the top and bottom of the shaft and one at each level served.

Control of the shaft lighting shall be independent and 3 way switched from the machine room, pit, and car top with each switch engraved 'Shaft Lighting'.

3A.08 Socket Outlets

Twin 13 amp socket outlets shall be provided adjacent to each controller, machine and in each lift pit. Each outlet shall be protected by residual current devices rated at 25amp 30ma.

3A.09 Car Lighting and Car Top Maintenance Control

Both the car top maintenance control light and socket outlet and the car lighting shall each have a separate feed from the consumer unit, with notices stating:

'CAR LIGHTING' and 'CAR TOP CONTROL'

3A.10 Machine Room Heating

A minimum of four 1200mm tubular heaters shall be fixed to the wall adjacent to each machine, fed from the consumer unit.

The heaters shall be controlled by a metal clad, wall mounted adjustable thermostat to provide ambient temperature control between +5°C and +20°C.

3A.11 CCTV - In Car Security Cameras

A low loss, co-axial travelling cable shall be installed terminating in conduit boxes at the car top and machine room suitable for the re-commissioning of the security cameras within the lift cars. The Contractor shall provide a 24v a.c. supply on the car roof for this purpose.

3A.12 Cooling

The Contractor shall provide cooling either by air conditioning, chiller unit or low velocity extract fan to achieve sufficient cooling to maintain the machine room equipment at the Contractor's designed operating temperature limits but in no event to exceed 40°C.

The Tenderer shall confirm in the Tender Return if the equipment to be provided shall require cooling.

PART THREE B

ELECTRICAL SPECIFICATION

ONE HYDRAULIC PASSENGER LIFT, HO92

INDEX - PART THREE
ELECTRICAL SPECIFICATION

SPECIFICATION OF THE WORKS

Clause No.	Title	Page No.
3B.01	General	3B/1
3B.02	Temporary Electrical Installation	3B/1
3B.03	Electrical Supplies	3B/2
3B.04	Lift Pump Room Auxiliary Supplies	3B/2
3B.05	Pump Room Lighting	3B/2
3B.06	Shaft Lighting	3B/2
3B.07	Socket Outlets	3B/3
3B.08	Car Lighting and Car Top Maintenance Control	3B/3
3B.09	Machine Room Heating	3B/3
3B.10	CCTV - In Car Security Cameras	3B/3
3B.11	Cooling	3B/3

PART THREE B

ELECTRICAL WORK - ONE HYDRAULIC PASSENGER LIFT, HO92

3B.01 General

The physical location of all equipment shall be agreed with the SO prior to any site installation work and all existing supplies, switchgear, conduits or trunking shall be removed where not compliant with the requirements of the specification.

All wiring shall be classified as low smoke and zero halogen.

All work necessary to provide a fully operational installation, compliant with all current standards and legislation including equipotential bonding of all exposed metalwork, shall be included.

The electrical works shall be undertaken by an NICEIC qualified electrician and a copy of all electrical test sheets shall be included in the Operation and Maintenance Manual.

The complete electrical installation shall meet the requirements of the specification.

3B.02 Temporary Electrical Installation

The Contractor shall provide all temporary lighting, low voltage power supplies and temporary supplies to drive the lift machine from existing supply points during the works in accordance with Health and Safety requirements.

The use of temporary supplies to drive the lift during the works shall be limited to as short duration as possible and shall comply with IEE electrical regulations and requirements.

Temporary site lighting shall be 110volt supplied with a centre tapped transformer with 100watt tungsten bulb light fittings positioned at 3m intervals. Each light fitting shall be protected to prevent accidental damage and arcing against conductive parts if broken.

Durable and environmentally protected 110volt power sockets and plugs shall be provided at 3m intervals.

Temporary lighting and power cables including extension leads shall be considerably used/located and cable tied to temporary works i.e: hoardings, scaffolding or the building fabric, to prevent tripping and guillotine hazards or snagging points occurring.

Wherever possible all electrical provisions shall be sourced from any new supplies fused switches and sockets as further specified.

3B.03 Electrical Supplies

New supplies comprising multi use armoured cable shall be provided from the plant room electrical intake area to the new pump room at Ground Level. The cables shall be routed via the existing cylinder chamber through the pit floor.

The supplies shall be terminated in a 63A TPN lockable fuse switch for the lift controller and a 63A SPN lockable fuse switch for the consumer unit.

3B.04 Lift Pump Room Auxiliary Supplies

A 9 way consumer unit shall be installed in the pump room adjacent to the 63A SPN fuse switch. The consumer unit shall incorporate miniature circuit breakers, to BS 3871, Type 2, to provide 240V a.c. single phase supplies as follows:

- | | |
|--|------------------|
| 1. Pump room lighting | - 6 Amps rating |
| 2. Pump room heating | - 20 Amps rating |
| 3. Power sockets | - 20 Amps rating |
| 4. Shaft lighting | - 6 Amps rating |
| 5. Car light supply | - 6 Amps rating |
| 6. Car top maintenance control, lighting and power | - 20 Amps rating |
| 7. Autodialler | - 6 Amps rating |
| 8&9. 2 spare ways | - Blanked off |

3B.05 Pump Room Lighting

Two twin 1500mm 58W fluorescent fittings with polycarbonate diffusers shall be positioned over the controller and pump unit to provide 200 lux illumination at floor level.

The light switch shall be located adjacent to the machine room access door and the supply to the luminaires shall be provided via a key operated switch with LED indication which, on operation, shall disconnect the supply, simulating mains failure for testing purposes.

Emergency luminaires shall be provided within each fluorescent fitting, each of an 8 watt fluorescent type, non-maintained.

3B.06 Shaft Lighting

Shaft lighting shall consist of 600mm twin fluorescent fittings with 3mm polycarbonate diffusers having screw fixings. One fitting shall be provided 500mm from the top and bottom of the shaft and one every 3m in between.

Control of the shaft lighting shall be independent and 3 way switched from the machine room, pit, and car top with each switch engraved 'Shaft Lighting'.

3B.07 Socket Outlets

Twin 13 amp socket outlets shall be provided adjacent to the controller, pump unit and in the lift pit. Each outlet shall be protected by residual current devices rated at 25amp 30ma.

3B.08 Car Lighting and Car Top Maintenance Control

Both the car top maintenance control light and socket outlet and the car lighting shall each have a separate feed from the consumer unit, with notices stating:

'CAR LIGHTING' and 'CAR TOP CONTROL'

3B.09 Machine Room Heating

A minimum of four 1200mm tubular heaters shall be fixed to the wall adjacent to the pump unit, fed from the consumer unit.

The heaters shall be controlled by a metal clad, wall mounted adjustable thermostat to provide ambient temperature control between +5°C and +20°C.

3B.10 CCTV - In Car Security Cameras

The Tenderer shall include for the future provision of CCTV.

A low loss, co-axial travelling cable shall be installed terminating in conduit boxes at the car top and machine room suitable for the installation of security cameras within the lift car. The Contractor shall provide a 24v a.c. supply on the car roof for this purpose.

3B.11 Cooling

The Contractor shall provide cooling either by air conditioning, chiller unit or low velocity extract fan to achieve sufficient cooling to maintain the machine room equipment at the Sub Contractor's designed operating temperature limits but in no event to exceed 40°C.

The Tenderer shall confirm in the Tender Return if the equipment to be provided shall require cooling.

PART THREE C

**ELECTRICAL SPECIFICATION
STANDARDS OF MATERIALS & WORKMANSHIP**

INDEX - PART THREE (Continued)

STANDARD OF MATERIALS AND WORKMANSHIP

3C.01	Regulations	3C/1
3C.02	General	3C/1
3C.03	Electricity Supply	3C/1
3C.04	Distribution Boards	3C/1
3C.05	Low Voltage Switches	3C/2
3C.06	Fusing	3C/2
3C.07	Fused Connection Units	3C/3
3C.08	Lighting Installations	3C/3
3C.09	Fixings	3C/4
3C.10	Cables	3C/4
3C.11	Flexible Cords	3C/5
3C.12	Trailing Cables	3C/5
3C.13	Final Sub Circuits	3C/6
3C.14	Conduits & Boxes	3C/6
3C.15	Flexible Steel Conduit	3C/7
3C.16	Steel Trunking/Cable Trays	3C/8
3C.17	Connections to Equipment	3C/9
3C.18	Earthing & Bonding	3C/10
3C.19	Labels	3C/11
3C.20	Circuit Lists	3C/11
3C.21	Testing	3C/11

ELECTRICAL - STANDARD OF MATERIALS AND WORKMANSHIP

3C.01 Regulations

The whole of the works shall be executed in accordance with the Regulations stated in this specification and all wiring shall be LSOH.

3C.02 General

All trunking, conduit and wiring shall be replaced unless otherwise specified.

All material shall be free from rust or damage and shall be stored 'off ground' and protected prior to use, with the ends or apertures in conduit, trunking and other equipment sealed.

Plugs and screws of adequate lengths and size shall be used for securing materials and equipment to structural concrete and brickwork. Fixings shall not be made in stud partitioning, plasterboard or structural steelwork nor shall 'fired' pins or screws be used.

Fixings to structural steel or metalwork shall be made by use of adequately sized and rigidly secured clamps manufactured from similar material to the steel or metal.

3C.03 Electricity Supply

The Contractor shall be responsible for all electrical installation work from the supply point.

3C.04 Distribution Boards

Distribution boards shall be metalclad and of the 415/500v pattern and comply with BS 5486: 1989, Part 11 or 12 as appropriate and be fitted as later specified with either:

- a) HRC fuselinks and carriers to BS 88 - 2.2 : 1988 with a fusing factor Q1 not exceeding 1.5 or,
- b) Miniature Circuit Breakers of the "current limiting" type, with "bolt-on" connections on the BS EN 60898 : 1991 or,
- c) Moulded Case-Circuit Breakers, to BS EN 60898 : 1991.

Every distribution board and the circuit phases and poles shall be clearly labelled.

Each distribution board shall be indelibly marked to indicate the number of the British Standard, i.e. BS 5486, the rated voltage and current, the suitability for use with AC only or DC only, the diversity factor and the manufacturer's name or distinguishing mark.

Neutral bus-bars shall be of the same current carrying capacity as the phase bus-bars and all SP & N, T.P & N distribution boards shall have one outgoing neutral terminal for each circuit.

A brass earth terminal block having the same number of terminals as the neutral bus-bars shall be provided and securely bolted to the inside of the distribution board case.

All distribution fuseboards shall be fitted with an earthing terminal with brass washers and nuts.

Distribution boards shall not be made up from "consumer unit" type enclosures unless specifically requested.

The distribution boards shall incorporate an integral isolator and contain the maximum number of fuseholders or miniature circuit breakers, irrespective of the number being used. All spare fuseways and miniature circuit breakers shall be of assorted sizes to correspond to the used ways of distribution board/consumer's control unit. The labelling of each circuit shall clearly identify the circuit fed and the mcb or fuseway.

3C.05 Low Voltage Switches

Isolators, switchfuses, fuseswitches, whether mounted in cubicle type switchboards or separately, shall conform to the requirements of BSEN 60947 : 1992 and Section 537 of the IEE Regulations and shall be rated at 500 volts, those items of fusegear which may be 250 volt rating provided that they:

- a) Are fed only by a single-phase supply.
- b) Do not form part of any switchboard in which phases other than the one feeding them are present.
- c) Are AC22 category of duty.

All contacts shall be fully shrouded and have breaking capacity on manual operation as required by the relevant British Standard. The fuse links shall be of high breaking capacity cartridge type conforming to BS 88 - 2.2:1988 which is a Class Q1 fusing factor and category of duty 550/440 VAC 80.

3C.06 Fusing

The current rating of every fuse for all fuse switches, switch fuse, distribution board, consumer's control unit, etc., shall be as indicated. Fuses shall comply with BS 88 - 2.2:1988. Miniature circuit breakers shall comply with BS EN 60898 : 1991, Type B.

Miniature circuit breakers shall be rated to withstand maximum short circuit current present at their point installation and shall comply with Section 533 of the IEE Regulations.

3C.07 Fused Connection Units

Fused connection units shall be double pole switched and comply with BS 5733.

The earthing terminal of each fused connection unit shall be connected by a separate 2.5mm² insulated green/yellow copper circuit protective conductor to an earthing terminal incorporated in the associated box or other enclosure where the circuit protective conductor is formed by conduit, trunking or ducting or the metal sheath and/or armour of cables. Fixing of cover screws shall not be relied upon for earth continuity.

The mounting height of fused connection units shall suit the equipment height served.

All fused connection units shall be complete with boxes for use in conjunction with the conduit or other wiring system in which they are used and each box shall be complete with a brass earthing terminal.

3C.08 Lighting Installations

All circuits and switching shall be as indicated on the contract drawings and/or schedules unless prior approval to their variation is obtained from the SO.

Unless specified otherwise, supply and erect all lighting fittings complete with lampholders, lamps, diffusers and include for any modifications to the manufacturer's standard suspension or mounting in order to comply with the requirements relative to mounting heights.

In the event of extra long stems or chains being required for lighting fittings the stems or chains shall be effected only for the purpose of shortening the manufacturer's standard suspension stems or chains, but the fundamental method of suspension shall not differ from that adopted by the manufacturer. Where chain suspensions are specified, the flexible cord shall be untwisted and each wire threaded through alternate links of the chain in a neat manner.

The internal wiring of the tube suspension and ceiling mounting lighting fittings shall be LSOH insulated flexible cable or other equal and approved heat resisting cable from a connector block fitted to the conduit box.

Unless stated otherwise, a separate earth conductor shall be installed with the flexible cord for chain suspended fittings and to fittings employing a non-earthed type of tube suspension.

Where lighting fittings are to be used in conjunction with surface conduit and/or conduit boxes, include for the supply of pattresses to be mounted over the conduit and/or boxes.

All fittings shall be lift in a clean condition.

All lamps shall be to the latest appropriate BS Specification of the approved manufacturer.

3C.09 Fixings

All fixings in brick, stone or concrete shall be made with standard "Rawplugs" for internal work and metal "Rawlplugs" with brass screws for all external work or for fixings in damp situations.

Fixings into brickwork joints and the use of wood plugs shall not be permitted.

In certain instances and subject to the approval of the SO fixings applied by a cartridge operated tool may be used.

All pattresses and boxes shall be securely fixed to the structure by at least two screws or other approved means so that they are held rigid and in correct alignment. Except where screw holes in the pattress or box are countersunk, round head screws shall be used.

3C.10 Cables

The names of the proposed cable manufacturers shall be submitted for approval to the SO and only the approved make shall be used throughout the installation unless specified otherwise.

All cables shall be copper conductor unless specified otherwise and shall comply with the appropriate British Standard. Types and sizes shall be as specified on the drawings and schedules and all cables shall be metric sizes.

Multicore armoured cables shall be LSOH insulated, LSOH sheathed and shall comply with BS 6724 : 1997 or MICC to BS 6207 : 1995.

Single core cables shall be LSOH insulated (and LSOH sheathed where indicated) and shall comply with BS 7211 : 1998.

No reduction of strands forming the conductor shall be allowed at switch or other terminals and all strands shall be effectively secured by screws, nuts and washers; brass thimbles or other approved means.

Cable connections to busbars shall be made using single core LSOH insulated cables of the same cross sectional area as the outgoing cables from the equipment being connected. Cables shall be terminated by means of compression fittings or mechanical clamps.

Unless particularly detailed in this Specification or drawings, cables shall not be run through lighting fittings.

Cable cores shall be coloured in accordance with Regulation 514-06-04.

All cables shall be subjected at the maker's works to the appropriate voltage tests, thickness of insulation test, insulation resistance, fire resistance and flexibility as set out in the appropriate British Standard and the coil shall bear the maker's name sealed to the coil and the results of the tests carried out.

In addition, the SO may take or cause to have taken from each coil delivered to site, a sample length or lengths of not less than 1.30m to be submitted to the tests set out in the appropriate British Standard. Should any sample fail to pass the tests, the coil from which it was taken will be rejected.

All cables shall be identified at both ends of connections using Critchley LSOH ferrules.

All cables for position indicators shall be screened.

No new coil or trailing cable manufactured more than twelve months prior to delivery to site will be accepted and the Contractor may be required to furnish satisfactory evidence of the date of manufacture of any coil.

All cables shall be drawn into conduits by means of draw wires or steel tapes and not 'fed in' from one end only. Cables shall be drawn in upon completion of erection and conduits shall not be dismantled for this purpose. Cables shall only be installed when the ambient and cable temperature has been above 0°C for at least 24 hours.

3C.11 Flexible Cords

Flexible cords shall be 300/500V grade single phase to BS 6500 : 1994 selected in accordance with IEE Regulations for Electrical Installation, BS 7671 : 1992.

Conductors shall be plain annealed copper strand LSOH cords and shall be tinned annealed copper stranded for elastomeric cords.

The conductors shall be insulated with LSOH. The cores shall be coloured brown and blue with earth wire coloured green/ yellow.

3C.12 Trailing Cables

The cables shall meet the requirements of the preceding sub-clauses where appropriate and shall be designed specifically for lift use.

The cables shall meet the requirements of BS EN 50214 : 1998 as amended and shall be of flat form design to be approved by the SO. The cables shall be hung in the lift shaft for a minimum of 24 hours with ends suitably weighted and free to rotate. When finally hung, it shall not be possible for any trailing cable to foul any fittings or equipment in the lift shaft.

The cables shall be PVC insulated and sheathed with a fire resisting compound finish having a maximum of twenty separately identified cores per flex and shall allow for 10% spare cores total.

The method of identifying cable cores shall be either colour or core markers.

The cables shall be run direct from the controller to the lift car and shall be contained within trunking from the controller to a position adjacent to the shaft anchorage point where the open end shall have a shroud.

Trailing cables serving the car light, car top light/power, door operator motor and associated circuit protective conductors shall be entirely separate from other circuit cables.

A separate cable shall be provided for the autodialler.

Clamps and/or wedges to a design approved by the SO shall be used for anchoring the cables both at the shaft anchorage point and under the car.

3C.13 Final Sub-Circuits

Every final sub-circuit shall be connected to a separate way of a fuseboard, a separate switchfuse or a circuit breaker and the conductor size shall be adequate for the duty as required by the IEE Regulations for Electrical Installation. All single pole switches shall be connected in the phase side of the system. The wiring of each final sub-circuit shall be electrically separate from every other final sub-circuit.

Neutral conductors shall be connected at the fuseboard in the same order as the live conductors are connected.

At termination points such as switch or socket outlets, etc., adequate length must be left on cable ends to ensure that there is no tension on the connections and sufficient for future re-making.

The conductor insulation must be removed for a minimum length to facilitate connections, and no excess length of exposed conductor shall be left.

The separate conductors of the same circuit or circuits shall in all cases be drawn into one conduit.

When preparing cable ends, the contractor shall ensure that none of the conductor strands are damaged, and the strands shall be twisted together by mechanical means to ensure a neat and firm connection. If the terminal is of sufficient size the twisted ends shall be doubled back to provide a larger area of contact. Where more than one stranded conductor enters a terminal, all strands shall be twisted together and not doubled back.

The Contractor shall bind the ends of all stranded cables above 6mm². No more than three conductors shall be connected to any one terminal at an accessory.

3C.14 Conduits and Boxes

The use of plastic conduit shall not be accepted.

All conduit and trunking together with associated fittings shall be made by a manufacturer having a licence to use the British Standard Institution mark and shall be heavy gauge screwed galvanised conduit to comply with BS 4568 : 1970 Part 2, with amendments. The inside surface shall be smooth, dry, free from burrs and other defects and, if deemed necessary by the SO, the Contractor shall have a rag drawn through to clear any material waste or moisture.

All conduit work on the walls and ceilings of machine rooms and shaft shall be installed on the surface, but where conduits cross finished machine room and/or pit floors they shall be securely fixed in recesses prior to building in. The Contractor shall be permitted to use approved galvanised trunking and fittings in lieu of conduit at positions where it is necessary to enclose a large number of cables.

The whole of the conduit system shall form a mechanically and electrically continuous installation.

Steel 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. Bends shall be a maximum of 90° and the inner radius not less than 2.5 times the outside diameter of the conduit. Where this is impracticable or where conduits runs exceed 10m in length or 7.5m when the run contains a bend or bends, draw-in boxes of ample size shall be provided. Drawn-in boxes shall be provided at all important changes in direction.

All vice marks, exposed threads or wherever the original finish has been damaged, shall be immediately painted with an approved zinc-based paint of matching colour.

Conduits fixed on the surface walls, ceilings, steelwork, etc., shall be secured by means of heavy iron distance saddles spaced at not more than 900mm apart with additional saddles as necessary at joints, bends and within 225mm of such fittings.

All free ends of conduit shall be fitted with female brass bushes.

At a switch, control unit, distribution board or other metal clad fittings, hexagonal male brass bushes and couplers suitably locked shall be used to terminate conduit in boxes, where a suitable screwed spout outlet is not provided.

Solid or inspection elbows, bends, tees, reducers or couplers shall not be used.

Conduits shall be run neatly and parallel to the general building lines and vertical runs shall be plumbed and horizontal runs shall be verified with a level.

All box lids shall be fitted by means of brass round headed screws. All conduit boxes, saddles and boxes shall be fixed to the building fabric by No. 8 wood screws with Rawplugs or similar fibre plugs.

All spare ways in junction boxes etc. provided for future extensions shall be fitted with brass stopping plugs.

During installation and subsequently, open boxes and other openings shall be suitably protected to prevent the ingress of concrete slurry, plaster or any other foreign material.

3C.15 Flexible Steel Conduit

All conduit connections to motors or other such items of removable equipment, unless otherwise stated, shall be made with LSOH sheathed metallic flexible conduit.

The flexible conduit shall terminate in the equipment fittings or conduit box etc. by means of a proper manufactured coupling. Terminations shall be complete with male bush and coupler.

A separate LSOH insulation green/yellow earth cable wire of suitable size, shall be run through all such flexible conduit, and shall be connected to the motor or other such item's earth terminal at one end, and with an M4 metric brass screw and washer tapped into the back or side of BS 4568 : 1970 conduit box at the other end.

3C.16 Steel Trunking/Cable Trays

The use of plastic trunking shall not be accepted.

Cables shall not be laid to the trunking until erection of the installation is complete.

All conduit and trunking together with associated fittings shall be made by a manufacturer having a licence to use the British Standard Institution mark and shall be manufactured to BS 4678 : 1971.

The whole of the system shall form an electrically and mechanically continuous system throughout.

All trunking and cable trays shall be from 16 gauge galvanised sheet steel and shall be electrically continuous by means of copper links across each joint with electric tinned bolts (heads inside) and nuts (6mm diameter minimum) flat and spring washers.

Flush floor trunking shall have a 6mm mild steel galvanised chequer plate cover carried in a tray with suitable gasket and secured by flush fitting set screws. The overall depth of the trunking shall not exceed 50mm.

All cut ends shall be rendered free from burrs and immediately painted with an approved zinc-based paint of a matching colour. LSOH bushing shall be fitted to any exposed edges of trunking.

All cable trunking shall have 33% square capacity for the drawing-in of any future cables, due precautions being taken to ensure that the correct space factor of the fully loaded trunking is provided in accordance with relevant clause in the current IEE Regulations.

Single phase or 3 phase power circuits shall be run in separate trunking.

Trunking accessories must be of the same manufacturer as the trunking system, and must be the correct item (e.g. bends, tees, connecting sleeves, end caps, etc.) as listed by the manufacturer.

All trunking fittings (i.e. bends, tees, etc.) shall leave the main trunking completely clear of obstruction and continuously open except through floors, wall partitions and ceilings, at which points suitable internal fire resisting barriers shall be provided as may be necessary to prevent the spread of fire. At these points the building element shall be made good to the same standard as the original construction.

Where tees, bends or similar fittings are used, particular attention shall be given to avoid damage to cables at corners. Any such damage shall be rectified by the Contractor at his own expense. All tees and bends shall be 'easy' type and factory made.

Where trunking is used to connect switchgear or fuseboard, such connections shall be made by a trunking fittings manufactured for this purpose and not be multiple conduit couplings.

The trunking lid shall be made from the same material as the trunking and shall be removable except where the trunking passes through ceilings, walls or floors, where the cover shall be firmly fixed before erection so that the cover plate extends 150mm either side of ceilings and floors and 50mm either side of the aperture. The cover shall be secured at centres not greater than 600mm by cadmium plated mushroom headed screws.

Cable retaining and supporting clips shall be provided at 600mm intervals in all trunking.

Trunking and cable trays shall be attached to the building fabric by No. 12 round headed zinc plated wood screws at a maximum 900mm spacing.

Screws and bolts securing trunking joins and trunking covers shall be arranged so that no damage to cables can occur.

Trunking and cable trays shall be installed neatly and parallel to the building lines and shall be plumbed where run vertically and installed to a spirit level where run horizontally.

3C.17 Connections to Equipment

Conduits to machines, pump units and equipment of a fixed nature shall, unless stated otherwise, be terminated in a BS 4568 : 1970 box, erected rigidly to the unit or erected adjacent on the building fabric, and the final connections in the latter case, e.g. motor or heater, etc., shall be by means of flexible conduit as previously specified.

All screw connections shall be securely locked to the satisfaction of the SO and shall be in accordance with the latest British Standard. All screws for electrical contacts shall be screwed into metal work or bolted through the insulating material.

The Contractor shall allow where necessary for connections of any control gear, starters, etc., that may be supplied by the equipment manufacturer.

When connecting motorised equipment, the final connection shall be of the same current rating as the final sub-circuit.

3C.18 Earthing and Bonding

General

The whole of the electrical installation and all other equipment connected thereto, shall be earthed to conform with the current IEE Regulations, BS 7671 : 1992 and to the requirements of the Supply Authority.

Earthing terminals shall be provided at the controller and on the lift car.

Circuit protective conductors shall be provided for the following:

- between main fused switch, isolator and controller.
- between controller and hoisting motor
- between each local switch and the equipment they control.

Bonding Clamps

Bonding clamps shall comply with BS 951 : 1999 and each clamp shall be complete with a permanent label indelibly marked with the words "Safety Electrical Earth - DO NOT REMOVE".

Earthing of Lighting Fittings and Appliances

The metalwork of all lighting fittings, appliances and similar equipment shall be effectively earthed by means of green/yellow LSOH insulated copper flexible cord of equal or greater diameter than the current carrying conductor.

Earthing of Socket Outlets

The earthing terminal of every socket outlet is to be connected to the earthing terminal in the accessory box by means of 2.5mm² green/yellow LSOH insulated cable.

Bonding

Equipotential protective bonding to the main earth terminal shall be provided throughout the lift installation to all metallic equipment and the means of achieving this requirement for the car and landing doors and the entrance steelwork and architraves shall be shown on the drawings for agreement by the SO.

A label stating "SAFETY ELECTRICAL EARTH - DO NOT REMOVE" shall be attached at every point of connection of every conductor which bonds extraneous conductive parts.

3C.19 Labels

Adhesive fixing of labels is not acceptable.

The Contractor shall allow for the supply and fixing of white Ivorine or Traffolyte labels to all switchgear and control gear, bus-bar chambers and distribution boards and black text on yellow background for warning signs, all to comply with BS 5378, Part 1 : 1980. The labels shall be engraved in 5mm characters filled with black epoxy resin and shall be fixed to the cover plates by means of brass headed screws.

Labels on switchgear shall denote the identification number/letter of switchgear current rating, polarity, circuit being fed, outgoing cable size and description of circuit. Where necessary diagrams, charts or signs shall be provided for this purpose.

Sub-switches which are out of sight of the lamps or equipment they control, or where there are more than two separate switches installed adjacent to each other, shall have their cover plates engraved, indicating the equipment they control.

The new main supply run shall be identified at 6m spacing detailing service.

A rigid LSOH safety sign/symbol indicating risk of electric shock, in conjunction with non-inflammable supplementary notice of approved design, indicating the maximum voltage present, shall be fixed to every enclosure of equipment. Equipment connected to more than one phase shall be clearly labelled "DANGER 415 VOLTS".

3C.20 Circuit Lists

Each distribution MCB and fuseboard and consumer's unit must be provided with a engraved circuit list having the following information:

1. Number of MCB/fuseway
2. Circuit description and location supplied by each MCB/fuseway.
3. Size of HRC MCB/fuses fitted, the size reference number of the fuse, or where miniature circuit breakers are fitted, and current rating of the circuit breaker.

The circuit list shall be white traffolyte with black lettering 5mm high. The circuit list shall be installed adjacent to, or below the distribution fuseboard or consumer unit to which it refers by means of 4 No. brass screws.

3C.21 Testing

The whole of the installation shall be tested on completion in the presence of the SO, in the manner described in the current IEE Regulations, BS 7671 : 1992. The Contractor shall provide the necessary labour, materials and instruments for carrying out these tests.

Testing and inspection shall generally be carried out in the following sequence.

1. Continuity of final circuit conductors

2. Continuity of all protective conductors.
3. Insulation resistance.
4. Verification of polarity
5. Earth fault loop impedance at relevant points.
6. Continuity test of metalwork of other services
7. Operation of protective devices.
8. Protection by electrical separation and/or barriers.

If any test indicates a fault condition, the fault shall be rectified and that particular test (and the previous tests) repeated to ensure the installation complies with the requirements of the aforementioned regulations.

Any instruments used shall be of the approved type for the purpose of the test and of such sensitivity to accurately record the values. All instruments shall have been tested and recalibrated if necessary within 6 months of the test and the instrument numbers shall be recorded on the appropriate test certificate which shall be available to the SO.

The SO may inspect the installation at any time during the contract and may require the Contractor to undertake inspections or tests, for any purpose, to confirm compliance.

The Contractor shall provide the SO with a minimum of 7 days prior notice of the proposed dates of all tests.

The Contractor shall be responsible for isolating and disconnecting any item of lift equipment which may be damaged or otherwise affected by the execution of the tests.

The Contractor shall submit the results of the tests to the SO on an Inspection Certificate of the type described in the above regulations within 7 days of testing.

The Contractor shall also check the labelling of circuits in the various distribution boards and switchboards, check that there are no cross circuits and that all fuse sizes are correct.

Visual checks are to be made of overload settings of all starts which should be set in relation to the full load rating of the motor they control.

Should the Regional Electricity company require a Certificate of Tests as a condition of accepting an installation or part thereof, for final connection to the supply, the Sub Contractor shall furnish such Test Certificate direct to the R.E.C. and a copy to the SO.

PART FOUR B

BUILDING AND CIVIL ENGINEERING

SPECIFICATION

ONE HYDRAULIC PASSENGER LIFT, HO92

INDEX - PART FOUR

BUILDING AND CIVIL ENGINEERING

SPECIFICATION OF THE WORKS

Clause No.	Title	Page No.
4B.01	Description of the Works	4B/1
4B.02	Phasing	4B/1
4B.03	Mess and Toilet Facilities	4B/1
4B.04	Protective Hoardings	4B/1
4B.05	Scaffolding	4B/2
4B.06	Plant and Cranage	4B/3
4B.07	Preparation of the Shaft and Landing Entrances	4B/3
4B.08	Existing Pump Room	4B/3
4B.09	Non-Hammered Cutting	4B/3
4B.10	Building in of Lift Entrances and Back Boxes	4B/3
4B.11	Air Vents	4B/4
4B.12	Painting	4B/4
4B.13	Finishes	4B/4
4B.14	Particular Specification for the Construction of a New Pump Room at Ground Floor Level	4B/5

PART FOUR B - ONE HYDRAULIC PASSENGER LIFT, HO92

BUILDER'S WORK REQUIREMENTS

4B.01 Description of the Works

The builders and associated works incorporate the provision of a newly constructed pump room at Ground Level, plus all compounds and storage areas and containers complete with all temporary protection, hoardings, compounds and attendance for the specific works to the shaft, pump room, landings and other areas in association with the lift refurbishment, all in conjunction with the specification and the drawings as listed, and as particularly described in the Contract and Preliminaries with this Tender document.

The Contractor shall take a photographic schedule of the condition of each landing entrance and the site of the new pump room prior to erection of the hoardings and issue one set of prints to the SO.

The pump room may be constructed in advance of the lift replacement programme and once secure may be used as a temporary storage area.

The Contractor shall at all times ensure that his method of work does not impede access.

4B.02 Phasing

The Tenderer shall provide a bar chart with the tender return detailing the Programme of Works which shall be written into the Contract.

Liquidated and ascertained damages shall be attributed to the programme.

4B.03 Mess and Toilet Facilities

The Contractor shall provide storage, office and mess room facilities for his operatives and his sub-contractors, complete with all temporary services.

4B.04 Protective Hoardings

The Contractor is reminded that the hoardings open directly on to the landings and the staircases, to which the residents and Royal Borough of Kensington & Chelsea Tenant Management Organisation Ltd employees have access, and that the appearance and containment of noise shall be taken into account in the design of the hoardings.

A drawing of the hoardings shall be submitted for approval by the SO.

Prior to the removal of any existing lift equipment, the Contractor shall provide a rigid protective hoarding to each entrance to the lift. The hoarding shall extend to a minimum height of 2.4m or to ceiling level and shall enclose such working space as is available to a minimum of 750mm from the face of the enclosure and the full width of the shaft, but shall not obstruct access or means of escape.

At Ground Level the lift lobby may be fully enclosed as a protected hoarding.

Each hoarding shall have a hinged and lockable access door meeting half hour fire resistance to a clear height and width to suit the Contractor's requirements. The hoardings shall be assembled from 20mm plywood and shall have 75mm x 50mm softwood framing to all edges.

The doors shall be not less than 20mm plywood with recessed hinges and shall be framed and braced with 75mm x 50mm softwood. The access doors shall open outwards, with restraints, from the lift shaft through an arc of not more than 90°, or as may be directed by the Building Control Officer.

The access doors shall be fitted with a mortice lock which shall be operable with the same key to all hoardings and six keys shall be provided for the use of the SO. Two 800mm shoot bolts shall be fitted on the inside of each door which shall have an external notice, stencilled 'DANGER - KEEP OUT', with an additional notice advising the floor number.

The floor surface within the hoarding shall be protected over the entire area with hardboard over polythene sheeting and the top section to the enclosure shall be boarded over.

The hoarding shall return as protection to the face of the painted landing walls and these areas to be lined with polythene and 15mm Tentest to protect the finishes.

Gaps between any adjoining surface shall not exceed 3mm and the method of fixing the hoardings shall be agreed with the SO and shall be such that the fixings cannot be removed from outside of the hoardings. The Contractor shall maintain the hoardings and doors in a safe condition through the duration of the work and shall not remove them until the day on which the lift is to be put into service, except by prior agreement with the SO.

All hoardings shall be constructed of new materials that shall adequately reflect the area within which they are sited.

The Contractor shall paint the hoardings two coats emulsion to generally match the surrounding area once erected. At the Ground Floor the Contractor may occupy the entire lobby area, with the permanent fixed door being removed and carefully stored.

The Contractor must be prepared to meet any additional requirements of the Building Control Officer as to the construction, fire resistance, overall dimensions, access doors and frames.

Under no circumstances are materials, products or equipment whether old or new, contractors or his sub-contractors be left unattended outside of hoardings or site storage areas.

4B.05 Scaffolding

Scaffolding shall be provided in the shaft for the use of the lift erectors and for builders work use and due allowance shall be made for cutting scaffold poles and boards to fit the shafts.

Working platforms shall be provided at 2.2m centres in the shaft and the Contractor shall include for inspecting and recording the scaffold condition weekly, making any necessary adjustments to ensure safe working conditions are maintained.

The scaffold shall have a removable section at the lowest floor to allow access for pit and lift car works.

4B.06 Plant and Cranage

The Contractor shall provide all necessary plant, hoists and/or cranes to remove, position and install lift equipment and building materials, and shall include all negotiations with the Police and Public Authorities for the appropriate authorisation.

Scaffold boards shall be used to support all materials and equipment temporarily landed or stored on exposed areas and securely fastened, heavy duty, weatherproof sheeting shall be used to protect the materials.

Storage of materials and equipment shall be in the Ground lift lobby level hoarding, in the newly constructed pump room or at the Walkway level.

4B.07 Preparation of the Shaft and Landing Entrances

It is imperative that dust and debris is contained within the shaft and machine room during the preparatory works and the Contractor shall undertake the following programme plus any other works that he sees fit.

After careful removal of the existing lift installation, all redundant bolts, steelwork and brackets within the lift shaft be cut out or off and made flush to the shaft surface and on completion of all cutting away the Contractor shall render all surfaces flush and smooth.

On completion of all these preparatory works and prior to any other works the Contractor shall thoroughly clean down the shaft by vacuum method.

4B.08 Existing Pump Room

The existing lift equipment shall be removed from the existing pump room within the plant area and the room shall be thoroughly cleaned and painted with two coats of white emulsion.

4B.09 Non Hammered Cutting

All demolition works and recesses, holes, pockets and additional fixings for guide brackets shall be cut by non-hammered tools. These works shall be undertaken between the hours of 9.30 am and 4.30 pm, and by prior arrangement with the SO.

4B.10 Building in of Lift Entrances and Back Boxes

When properly positioned and fixed, the landing entrance equipment and back boxes shall be built in. The complete new entrance at the offices walkway level shall be enclosed by a semi permanent studwork and marine ply screen, decorated to harmonise with the surroundings.

4B.11 Air Vents

The Contractor shall remove and clean the air vents and fit mesh fly screens to the shaft.

4B.12 Painting

Immediately upon completion of the works outlined in 4B.07, 8 and 10, the Contractor shall paint the shaft fabric with one coat stabiliser and two coats white emulsion.

Immediately after removal of the lift installation the heavily oil contaminated pit shall be degreased with solvent. The floors to the pump room, the pit, and the pit walls to 300mm high, shall be painted with red non-slip paint.

4B.13 Finishes

The Contractor shall finish the linings and floor finishes up to the trims, architraves and sills where these items are affected by the works and thus making good shall match or harmonise with the adjacent finishes.

Where the front walls are painted they shall be repainted to harmonise with the existing décor to ceiling level and to the nearest door jamb or corner.

4B.14 Particular Specification for the Construction of a New Pump Room at Ground Floor Level

4B.14.01 Preliminary Works

4B.14.01.1 Pressure hose clean the entire area and the bicycle store, relocate the bicycle store and hoard off the working area in accordance with 4B.04 for the duration of the works.

4B.14.02 Demolition Works

4B.14.02.1 Remove the metal and timber screen and make good.

4B.14.02.2 Strip out the bitumen macadam pavings and expose reinforced suspended concrete ground slab and undertake any remedial measures as recommended by the structural engineer, including casing new 100mm thick mass concrete floor slab with a floated finish.

4B.14.03 Masonry

4B.14.03.1 Construct cavity wall brickwork with outer skin of multi-stock brickwork to closely match the existing and inner skin of fair faced blockwork, with painted finish in accordance with 4B.12.

4B.14.03.2 Form opening in existing wall approximately 300 x 300mm for services.

4B.14.04 Roof Works

4B.14.04.1 Construct reinforced concrete flat roof slab with parapet upstand and asphalt coverings with white / silver solar reflective paint.

4B.14.05 Concrete Works

4B.14.05.1 Construct mesh reinforced concrete floor screed to make up levels.

4B.14.06 Joinery

4B.14.06.1 Form single door opening size 2100 x 900mm in varnished hardwood to match the existing entrance screen.

4B.14.07 Roof Drainage

4B.14.07.1 Install rainwater outlet to flat roof and run rainwater pipe and connect to existing drainage system.

4B.14.08 Materials

4B.14.08.1 Multi-stock clay facing bricks to closely match the existing.

4B.14.08.2 Varnished hardwood single door and frame to match the existing entrance frame.

4B.14.08.3 Concrete flat roof slab with white / silver solar reflective paint finish.

4B.14.08.4 Cycle storage as existing.

PART FOUR C

BUILDING AND CIVIL ENGINEERING

SPECIFICATION

STANDARDS OF MATERIALS & WORKMANSHIP

INDEX - PART FOUR (Continued)

STANDARDS OF MATERIALS AND WORKMANSHIP

Clause No.	Title	Page No.
4C.01	Generally	4C/1
4C.02	Demolitions and Alternations: Generally	4C/1
4C.03	Support of Existing Structure	4C/1
4C.04	Services	4C/2
4C.05	Demolition Materials	4C/2
4C.06	Excavations: Generally	4C/2
4C.07	Obstructions Found During Excavation	4C/2
4C.08	Support of the Sides	4C/2
4C.09	Water in the Excavations	4C/2
4C.10	Underpinning	4C/3
4C.11	Backfilling	4C/4
4C.12	Hardcore	4C/4
4C.13	Concrete Work	4C/4
4C.14	Reinforcement	4C/4
4C.15	Formwork	4C/5
4C.16	Minimum Cement Content for Durability	4C/5
4C.17	Strength Requirements of Concrete	4C/6
4C.18	Ready-Mixed Concrete	4C/6
4C.19	Site Mixed Concrete	4C/6
4C.20	Placing Concrete	4C/7
4C.21	Brickwork and Blockwork: Generally	4C/7
4C.22	Blockwork	4C/7

L2508

INDEX - PART FOUR (Continued)

4C.23	Brickwork	4C/8
4C.24	Bricks and Blocks - Comprehensive Strength	4C/8
4C.25	Work Below Ground	4C/8
4C.26	Work Above Ground	4C/8
4C.27	Delivery and Storage	4C/8
4C.28	Cement	4C/9
4C.29	Lime	4C/9
4C.30	Sand	4C/9
4C.31	Water	4C/9
4C.32	Plasticisers	4C/9
4C.33	Damp Proof Courses	4C/9
4C.34	Stainless Steel Straps, Ties and Anchors	4C/9
4C.35	Air Bricks	4C/10
4C.36	Construction Joints in Brickwork	4C/10
4C.37	Floor Paint	4C/10
4C.38	Mortars Generally	4C/10
4C.39	Brickwork Workmanship	4C/10
4C.40	Brickwork in Cold Water	4C/10
4C.41	Bond	4C/11
4C.42	On Completion	4C/11
4C.43	Asphalt Work: Mastic Asphalt Tanking	4C/11
4C.44	Underlay	4C/11
4C.45	Mastic Asphalt Roofing	4C/11
4C.46	Carpentry and Joinery	4C/11

L2508

INDEX - PART FOUR (Continued)

4C.47	Plasterwork	4C/12
4C.48	Screeds and Backings	4C/13
4C.49	Tile and Sheet Finishings	4C/14
4C.50	Painting and Decorating	4C/14

MATERIALS AND STANDARDS OF WORKMANSHIP

4C.01 Generally

1. The whole of the works shall comply with the requirements of the London Building (Constructional) By-Laws 1972 or The Building Regulations 1972, as appropriate. Drainage work shall comply with the requirements of the Drainage By-Laws made by the Greater London Council and/or the local By-Laws, and shall be executed to the satisfaction of the Engineer and the Local Authority.
2. Except where otherwise stated the sub contractor shall be at liberty to provide any material or process which complies with the description contained in the relevant specification clause. The sub contractor may also put forward the name of any similar material or process for approval but such material or process shall not be used until approval has been given by the Engineer or SO.
3. Cement, lime and plaster shall be stored off the ground in a dry, ventilated place. Aggregate, fine aggregate and sand shall be stored on clean hardstandings, and kept separate. Bricks and clay blocks shall be stored on level hardstandings and be protected from inclement weather. Concrete blocks shall be open stacked to permit ventilation and be protected from inclement weather. All other manufactured items shall be stored under cover. Painting materials shall be kept in a dry clean store, protected from frost.
4. No concrete shall be laid in frozen ground. No frozen materials shall be used. No concreting, bricklaying or plastering shall be carried out when the air temperature falls below 3°C (37°F) unless adequate precautions are taken to ensure the work is protected from damage. No painting work should be carried out when the air temperature falls below 4°C (40°F) unless the permission of the Engineer or SO has been previously obtained.

4C.02 Demolitions and Alterations: Generally

1. Before starting work examine all available drawings and undertake a thorough examination of the structure of the building.
2. Adequately protect the existing building during the work. Execute demolition works with care to provide the minimum disturbance to the occupiers of the building. Cut away and strip out the minimum necessary to reduce the amount of making good required.

4C.03 Support of Existing Structure

When demolishing structures, leave adequate temporary support and protection at each stage and arrange for inspection by the Engineer or SO. Leave permanent support to the existing property as instructed by the Engineer or SO. Proceed with subsequent stages of demolition as agreed with Engineer or SO.

Support the existing structure as necessary during cutting of openings or replacement of structure parts. Do not remove supports until new work is strong enough to support the existing structure.

4C.04 Services

Before starting demolition, arrange for the electrical sub-contractor to disconnect all services which cross the site of the work.

Maintain electrical services to the occupied parts of the building. Ensure that where services have to be disconnected for diversion or during works, that the supplies are off for the minimum period possible and that advance notice of any such disconnection is notified to the Engineer or SO at least a day in advance of the work being undertaken.

4C.05 Demolition Materials

Products and materials arising from the work are to become the property of the sub contractor unless otherwise stated. Remove from site as work proceeds.

4C.06 Excavations: Generally

The whole of the excavation shall be carried out to the required lines and levels, widths and depths as shown on the drawing or agreed on site.

Where made deeper than directed the ground shall be made up with concrete (1:10) at the Contractor's own expense.

Where taken out to greater lengths and widths they shall be filled with material well rammed at the sub contractor's own expense.

The bottom of all excavations are to be approved by the Engineer or SO before concrete is placed on them.

4C.07 Obstructions Found During Excavation

Redundant drain pipes, roots, old foundations, etc., shall be broken up and removed from site. The Engineer or SO shall be notified if any live drain or other service is found.

4C.08 Support of the Sides

The sub contractor shall provide all necessary temporary timbering, sheeting, strutting etc., to ensure the stability and safety of the excavations.

4C.09 Water in the Excavations

Excavations shall be kept free from water at all times. The responsibility for removing water shall rest with the sub contractor and no claim for expenses incurred shall be entertained. Where pumping is necessary, the sides and bottom of the excavations shall not be disturbed. All sumps shall be excavated clear of excavations.

4C.10 Underpinning

1. The Contractor shall be responsible for ensuring that his operations do not in any way impair the safety or condition of the existing structure or the adjacent properties. He shall provide any temporary supports required for the purpose, and shall carefully inspect the condition of the structure both before and during the execution of the work, and immediately inform the Engineer or SO if he considers that any more stringent procedure than that specified is necessary.
2. Underpinning is to be carried out to the satisfaction of the Engineer and Building Inspector in short sections not exceeding 1000mm in length.
3. The underside of the footings are to be cleaned and hacked free of any dirt, soil or loose materials before underpinning.
4. The body of the underpinning is to be constructed in concrete mix Type A, using sulphate resistant cement and 20mm aggregate, and is to be cast to the widths and depths shown on the drawings. As far as practicable excavation and concreting of any section of underpinning shall be carried out on the same day. Unconcreted sections shall be kept covered to prevent the ingress of water.
5. The mass concrete is to be stopped off approximately 75mm below the underside of the existing footing, and the final pinning up over the whole extent of the latter is to be carried out with a semi dry fine concrete well rammed in as soon as possible after the foundation has set hard.

The pinning up concrete is to consist of 1 part by volume of sulphate resistant cement to 3 parts of aggregate (well graded from 10mm maximum size down to fine sand) with a water/cement ration by weight of 0.35.

6. Excavation to any section of underpinning shall not be commenced until at least 48 hours after completion of any adjacent section of the work.
7. The joint between adjacent sections of mass concrete underpinning shall be made by forming a rough surface against which the first sections is to be cast, and thoroughly cleaning the exposed concrete face before the adjacent section is cast.
8. Mild steel rods 16mm in diameter and 600mm long shall be cast equally into each section to cross the joint, at 300mm centres vertically and horizontally.
9. The Contractor shall prepare a sequence of work and submit it to the Engineer or SO for his comments 1 week prior to the commencement of the work.

4C.11 Backfilling

Backfilling of trenches etc. with excavated material shall be carried out using the best of the excavated sub-soil, free from vegetable soil or rubbish, and not frozen, and shall be consolidated in layers not exceeding 150mm thick and well rammed. Where backfilling is required below the level of the existing foundations concrete of the same mix as that used for foundations shall be used instead of soil.

4C.12 Hardcore

Hardcore shall be hard stone, broken brick or concrete rubble not exceeding half brick size free from plaster, rubbish or organic materials.

4C.13 Concrete Work

Cements shall comply with the British Standards as follows:

Portland Cement	BS 12: Part 2
Rapid Hardening Cement	BS 12: Part 2
Sulphate Resisting Cement	BS 4027: Part 2 and as listed

Aggregates shall comply with British Standards as follows:

Fine (sand)	BS 822: Part 2
Coarse	BS 822: Part 2 graded
'All in' ballast	BS 882: Part 2 graded

Reinforcement shall comply with British Standards as follows:

Mild Steel	BS 4449
Cold worked deformed bars	BS 4461
Steel fabric	BS 4483

Admixtures for promoting workability, for improving strength, for entraining air or for any other purpose shall only be used with the prior approval of the Engineer or SO. The amount added and the method of use must be approved and strictly controlled.

Waterproof building paper shall comply with BS 1521: Grade B1F.

Water shall be from the mains and kept free of any impurities.

4C.14 Reinforcement

Steel bar reinforcement to the underpinning pit floor and elsewhere is to comply with BS 4449 and BS4461 and is to be cut and bent in accordance with BS 4466. Fabric reinforcement is to comply with BS 4483. The Contractor is referred to the bar bedding schedules supplied by the Structural Engineer for details of what is required.

The prices for reinforcement are to include all tying wire, distance blocks and spacers.

4C.15 Formwork

The sub-contractor is to be responsible for the adequacy of the formwork. It shall be of sufficient strength to carry all loads imposed on it during construction. Formwork is to be constructed from plywood or steel sheet with steel or timber supports at close centres to avoid any deflection, all joints are to be sealed to prevent seepage of grout. All surfaces in contact with concrete are to be thoroughly cleaned and treated with mould oil or other suitable and approved composition.

4C.16 Minimum Cement Content for Durability

This also relates to maximum/cement ratio where applicable.

The figures given below are to durability only but not necessarily sufficient for strength. The Contractor must provide as much cement as necessary to achieve the strength requirements specified elsewhere in this specification.

Mix Ref	Grade	Normal Maximum Size of Aggregate	Concrete not exposed to sulphates	Concrete exposed to sulphates		Maximum free water cement ratio	Location
			Minimum cement content (kg/m ³)	Minimum cement content (kg/m ³)	Cement		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A	C35	20		300	SCR	0.55	
B	C35	20	300				
C	C35	10	315				
D	C20	20	220				

OPC = Ordinary Portland Cement.

SCR = Sulphate Resisting Cement.

Note. The maximum cement content of 550kg/m³ must not be exceeded.

4C.17 Strength Requirements of Concrete

Grade	Trial Cubes Average Strength per mix to be not less than	Concrete Used in the Works		
		Only two out of forty consecutive cubes of one mix may be less than	Minimum strength of individual cubes	Average strength of any four consecutive cubes of one mix, to be not less than
	(N/mm ²)	(N/mm ²)	(N/mm ²)	(N/mm ²)
C20	24	20	18	23
C25	29	25	22	28
C30	34	30	27	33
C35	39	35	32	38

1. All strengths refer to cubes crushed at 28 days.
2. The prediction of the 28 days' strength from cubes crushed earlier is at the discretion of the Engineer or SO.
3. The calculation of the 28 days' strength from cubes crushed at a later date is at the discretion of the Engineer or SO.
4. The term "cube" and "cubes" mentioned in this section mean cube and cubes respectively made and cured in accordance with BS 1881 Part 3.
5. The validity of tests other than cube tests, the interpretation of results of such tests and the conversion of such results into equivalent cube strengths are at the discretion of the Engineer or SO.

4C.18 Ready-Mixed Concrete

Ready-mixed concrete shall comply with BS 1926 and shall be obtained from an approved supplier.

4C.19 Site Mixed Concrete

Site mixed concrete will only be permitted for unreinforced work.

Materials shall be measured using gauge boxes or by weight. The mix shall be consistent throughout; all ingredients shall be moist, but the concrete shall not be so wet that the concrete flows into place or shows excess water on the surface.

4C.20 Placing Concrete

After mixing, the concrete shall be conveyed quickly to its final position in the work and thoroughly worked into place with suitable tools to surround any reinforcement and form a solid mass without voids or honeycombing.

All concrete shall be placed within half an hour of mixing, and shall be carefully tipped into place and compacted thoroughly to eliminate voids without causing materials to separate. Ready-mixed concrete shall be placed and compacted within two hours of the addition of the cement to the aggregate.

All concrete shall be mechanically mixed by machinery. The quantity of water shall be the minimum required to ensure a uniform distribution of materials, and workability. On the cessation of work including short stoppages for meals or on any change of cement used in the mix, the mixer and all handling plant shall be washed out with clean water.

The sub contractor shall obtain approval before using ready mixed concrete.

Reinforcement shall be free from all loose rust, oil, grease or similar defects, immediately before placing the concrete.

Formwork shall be true to line, level, face and profile, sufficiently rigid to maintain its shape during and after pouring concrete and be grout tight. Formwork shall not be struck until the concrete has sufficiently hardened.

Concrete shall be placed in its final position as rapidly as practicable by methods which preclude segregation or loss of ingredients; compaction shall be completed before initial set commences. Partially set concrete shall not be re-worked or used. Concrete shall be thoroughly compacted by punning with suitable tools, or by vibrators.

All concrete shall be prevented from drying out until properly cured.

4C.21 Brickwork and Blockwork: Generally

All masonry shall comply with BS 5627, Code of Practice for the structural use of Masonry

4C.22 Blockwork

Generally all blocks are to be the best of their respective kinds, hard, square and sound, in accordance with the following:-

1. Fired-clay block to BS3921
2. Concrete blocks to BS6073
3. Brick and Blocks to be special category to BS5628 : Part 1

4C.23 Brickwork

Generally all bricks are to be of their respective kinds, hard, square, sound and well burnt in accordance with the following:-

1. Fired-clay bricks to BS3921
2. Calcium silicate bricks to BS187
3. Concrete bricks to BS6073

All bricks used in cavity walls shall be whole bricks and no snapped headers are to be used.

4C.24 Bricks and Blocks – Comprehensive Strength

All brickwork and/or blockwork shall have the required minimum compressive strengths as specified on the Engineer's or SO's drawing.

The Contractor shall satisfy the Engineer or SO before bulk orders are placed, and at intervals as required throughout the period of delivery, that batches of brickworks and/or blockwork used have the required minimum crushing strength as shown on the Engineer's or SO's drawing.

The Contractor shall furnish the Engineer or SO with reports or certificates of such tests carried out by the brick or block suppliers and produce evidence to show that a regular, efficient method of quality control as referred to in BS3921 is in use.

4C.25 Work Below Ground

1. All blocks to be dense concrete with minimum crushing strength of $7N/mm^2$.
2. All bricks to have a minimum crushing strength of $20N/mm^2$ Class 4 or better.
3. All mortar below ground to be 1:½:4½ designation ii, or better made with sulphate resisting cement.

4C.26 Work Above Ground

Mortar shall use OPC and to be 1:1:6 mix

NOTE 1: for non load bearing blockwork refer to Engineer's or SO's specification.

NOTE 2: if higher strength masonry units are required then this shall be stated specifically on the drawings.

4C.27 Delivery and Storage

All bricks and blocks shall be carefully unloaded and stacked, so that they will normally be used in order of delivery.

They should be unloaded by hand or machine on to a reasonably dry and level site, and not tipped from vehicles.

They must be protected from rain, snow and rising moisture.

If bricks or blocks are stacked on suspended slabs attention is drawn to the maximum imposed loading on the slabs, at 28 day strengths, which must not be exceeded without adequate propping as shown in the appropriate MMP specification.

4C.28 Cement

Cement shall be ordinary Portland cement complying with BS 12, and shall be sulphate resisting below damp proof course level.

4C.29 Lime

The lime is to be approved hydrated lime and used in accordance with the manufacturer's instructions.

4C.30 Sand

The sand is to comply with BS 1200: Table 1. Colour is to match existing as closely as possible.

4C.31 Water

The water used for mortar is to be fresh drinkable water.

4C.32 Plasticisers

No plasticisers or other admixtures shall be used without the Engineer's or SO's written approval.

4C.33 Damp Proof Courses

The damp proof courses shall be Ruberthene polythene membrane, manufactured by Ruberiod Building Products Ltd., Tewing Road, Welwyn Garden City, Herts, AL7 1BP (telephone [REDACTED]).

4C.34 Stainless Steel Straps, Ties and Anchors

All stainless steel straps and ties shall be BAT Stainlessfix, manufactured by Expamet Building Products Ltd., P.O. Box 14, Longhill Industrial Estate (North), Hartlepool, Cleveland, TS25 1PR (telephone [REDACTED]).

The Halfen stainless steel slots and anchors are manufactured by Halfen Fixing Systems Ltd., Griffin Lane, Aylesbury, Bucks, HP19 3BP (telephone [REDACTED]).

4C.35 Air Bricks

Air bricks shall be standard 225mm Square terracotta, colour to match brickwork as closely as possible.

4C.36 Construction Joints in Brickwork

Joints are to be provided as stipulated on the Engineer's or SO's drawings. The Miothene30 filler is manufactured by LJA Miers (Special Products) Ltd., Church Street, Gamlingay, Sandy, Beds, SG19 3JH (telephone [REDACTED])

4C.37 Floor Paint

Where water exists within the pit area, or the pit walls emit heavy dampness, the Contractor shall remove all water and when completely dry shall treat the walls and pit floor with 'Watco Universal Sealer'.

Once dry the walls are to be treated with 2 coats of 'Watco Safety Sealer'.

In the event that it is not possible to remove all traces of the water then three coats of 'Watco Octo Seal' are to be applied to the pit walls and floor.

4C.38 Mortars Generally

Gauge boxes are to be used for measuring materials for mortars.

4C.39 Brickwork Workmanship

Lay bricks on a full bed of mortar and fill all cross joints. Keep courses level, true to line and evenly spaced. Accurately plumb all wall faces, Gauge brick courses four to 300mm including joints. No part of the work shall rise more than 10000mm above the adjoining work. All blockwork shall be accurately set out and built plumb, properly bonded and well pinned up to soffits.

4C.40 Brickwork in Cold Water

1. Do not freeze materials and do not lay on frozen materials and do not lay on frozen surfaces.
2. Do not lay bricks/blocks when air temperature is at or below 3° unless mortar has a minimum temperature of 4° when laid and walling is protected.
3. Maintain temperature of the work above freezing until mortar has fully hardened.
4. Adequately protect newly erected walling against rain and snow by covering when precipitation occurs and at the completion of each days works.
5. Rake out and replace mortar damaged by frost and where instructed, rebuild damaged work.

4C.41 Bond

Half brick walls shall be in stretcher bond and one brick and thicker walls in bond to match the surrounding brickwork. No cut bricks shall be used except where required for bond. Tothing and corbelling shall be executed where necessary. Facing brickwork shall be pointed to match existing.

4C.42 On Completion

Putlog holes shall be pointed to match the adjacent work and facing brickwork cleaned down and left free from marks and mortar.

4C.43 Asphalt Work: Mastic Asphalt tanking

The asphalt for tanking is to be natural rock asphalt to BS 6577 and laid in accordance with the recommendations of the Mastic Asphalt Consortium Technical Advisory Service (telephone [REDACTED]).

4C.44 Underlay

The isolating sheathing felt underlay for asphalt roofing shall be to BS 747, type 4A – bitumen felt, laid directly on the construction.

4C.45 Mastic Asphalt Roofing

The asphalt for roofing is to be natural rock asphalt to BS 6577 and laid in accordance with the recommendations of the Mastic Asphalt Consortium Technical Advisory Service (telephone [REDACTED]).

4C.46 Carpentry and Joinery

1. Timber shall be sound, well conditioned, properly seasoned to suit the particular use and free from defects or combination of defects rendering it unsuitable for the purpose intended. It shall be hardwood and softwood as defined in BS 881 and 589 respectively. All timber used structurally shall comply with the relevant By-Laws and Regulations. Timber for joinery shall comply with BS 1186, Part 1.
2. Plywood shall comply with BS 1455:
 - Grade 1 for clear finish
 - Grade 2 for painting
 - Grade 3 for concealed surfaces or of corresponding grades of veneers and type of bonding if from sources not included in BS 1455.
3. Screws shall comply with BS 12101.
Nails shall comply with BS 1202.
Black Bolts shall comply with BS 916.

Ragbolts, coach screws and other accessories shall comply with BS 1494, Parts 1 and 2

Timber connectors shall comply with BS 1579.

Nails for fixing joinery having an external exposed face shall be aluminium or sheradised in accordance with BS 1202, Part 3 or Part 1 respectively. Galvanised joist hangers shall be 2.5mm minimum thickness steel.

4. Workmanship for joinery shall comply with BS 1186, Part 2.
5. Timber generally shall be protected from dampness. Joinery shall be protected from the weather during transit and shall be stored under cover, clear of the ground in clean, dry, ventilated structures before and after priming.

4C.47 Plasterwork

1. Lime putty shall be prepared from hydrated lime complying with BS 890, Part 2.
2. Gypsum building plasters shall comply with BS 1191, Part 1 and Part 2 premixed lightweight plasters, of the classes described and used in accordance with the manufacturer's recommendation.
3. Sand for gypsum plaster mixes shall comply with BS 1198, Table 1 Type 1. Sand for cement and lime mixes shall comply with BS 1199, Table 1.
4. Ready mixed lime and sand shall comply with BS 4721. When gauging with cement care shall be taken to adjust the amounts to obtain the required proportions.
5. Plasticisers shall be of the resin type used in accordance with the manufacturer's instructions.
6. Aluminium and steel angle and casing beads shall be used.
7. Surfaces to receive plaster shall be dry brushed to remove all loose particles, dust, etc. and shall be wetted to equalise suction before the first coat is applied.
8. Plaster lath shall comply with BS 1230, Part 2 and be fixed in accordance with the manufacturer's recommendations with joints completely filled with neat Class 'B' board finish plaster.
9. All materials shall be thoroughly mixed in the proportions described. No re-tempering will be permitted except as is reasonable for class 'C' gypsum plaster, and fresh plaster shall not be contaminated with set plaster. Bankers and gauge boxes shall be cleaned after each mix.

10. Unless otherwise described all finishing coats in cement based mixes shall be finished with a wood float, and finishing coats in gypsum and lightweight plasters with a steel trowel. A neat cut shall be made with the edge of the trowel through all coats of wall plaster at the junction with the ceiling plaster. Unless otherwise described all arises shall be pencil rounded.

11. The proportions stated in the following table shall be by volume.

Ref.	Plaster		Thickness	Surface Plastered
A	Setting coat Class 'B' board finish	neat	5mm	Plaster Lathe
D	Undercoat (cement/lime putty sand) (OR plasticised cement sand) Finishing coat Class C finishing/lime putty	1:1:6 1:6 3:1	16mm	Brickwork and Blockwork
E	Undercoat Bonding plaster finishing Coat Class 'B' finishing	neat neat	13mm	Concrete and Smooth Dense Surfaces
G	Undercoat lightweight browning finishing Coat lightweight finishing	neat neat	13mm	Brickwork and Blockwork
H	Undercoat bonding plaster finishing Coat lightweight finishing	neat neat	13mm	Concrete and Smooth Dense Surfaces
O	Undercoat Cement/lime putty sand OR Plasterised cement/sand Finishing coat as for undercoat	1:1:6 1:6		
P2	Cement/sand in two coats	1:4		

4C.48 Screeds and Backings

1. Cement and sand and mixing of materials shall be as described in 'Plasterwork'.
2. Cement and sand screeds or backings shall be in proportion of 1:4 by volume.
3. Walls shall be prepared as for 'Plasterwork' Clause 4.3.7. Concrete floors and roofs, shall be hacked to remove concrete, mortar or plaster droppings and well brushed to remove all loose particles and dirt. Surfaces shall be wetted as necessary before screeding.

4. Screeds and backings shall be laid in suitable sized bays and shall be kept wet and protected until set hard and shall be left with a surface for the appropriate finish.

4C.49 Tile and Sheet Finishings

1. Materials for mortar and mixing shall be as described in 'Plasterwork'.
2. All surfaces to receive finishings shall be thoroughly cleaned and screeds to receive mortar beds shall be well wetted.
3. Glazed and eggshell ceramic wall tiles shall comply with BS 1281, of the colours described. Tiles shall be fixed in suitable tile adhesive in accordance with the manufacturer's recommendations and joints shall be pointed in white/tinted cement.
4. Clay tiles shall comply with BS 1286, Type A (Class 1 for external use and Class 2 for internal use). The tiles shall be thoroughly soaked in water and drained off before bedding in cement and sharp sand (1:2) pointed in cement and sand (1:2), coloured where directed.
5. Linoleum and thermoplastic tile flooring will generally be the subject of a P.C. sum.
6. Plasterboard lining to receive direct decoration shall be gypsum wallboard complying with BS 1230, Part 2 fixed with ivory face outwards in accordance with the manufacturer's recommendations.

4C.50 Painting and Decorating

The relevant British Standard Code of Practice to this Section is C.P. 231 'Painting of Buildings'.

1. Painting and decorative schemes shall be carried out in colours selected by the SO.
2. All paints, varnishes, distempers and other surface coatings shall be delivered in sound and sealed containers, labelled clearly by the manufacturer, the label or decorated container stating:-
 1. The type of product;
 2. The brand name, if any;
 3. The use for which it is intended;
 4. The manufacturer's batch number.

The label shall be a printed label, typewritten labels will not be accepted. The batch deliveries shall be dated and used strictly in order of delivery.

3. While materials for the works may be obtained from several makers, undercoats and finishing coats for a particular surface must be obtained from the same maker. The materials are to be used in accordance with the manufacturer's instructions and the addition of thinners or other material will only be permitted when required by the maker.

Samples for analysis may be taken both from the kettle and paint cans by the Engineer or SO. Any unsatisfactory materials shall be removed from the site and any work executed by such defective materials shall be made good by the Contractor at his own expense to the satisfaction of the Engineer or SO.

4. Concrete, rendering or brickwork shall be of a similar materials to the background and shall be finished with a similar texture;
5. White spirit shall comply with BS 245.
6. Turpentine shall comply with BS 244 and 290, either type 1 or type 2.
7. Size shall comply with BS 3357.
8. Emulsion paint - the first coat shall be thinned in accordance with the manufacturer's instructions.
9. Plastic compound shall have a washable finish.
10. Black bituminous paint shall comply with BS 3416, Type 1 for general use, Type 11 for drinking water tanks.
11. Multi-colour paint and the appropriate priming coat shall be obtained from the same maker.
12. Hard gloss, eggshell and emulsion paints and their respective undercoats shall be obtained from the same maker.
13. Alkyd varnish shall be interior or exterior quality.
14. Polyurethane lacquer shall be single pack polyurethane lacquer, interior quality.
15. The preparation of all surfaces including any cleared off prior to redecorations must be seen and approved before any surface coatings are applied. All plaster and mortar splashes etc., shall be removed from surfaces to be decorated. All surfaces shall be brushed down to remove dust and loose material. Surfaces shall be subsequently prepared as follows prior to decorations:-
16. Plaster, rendering, concrete and brickwork - stop holes and cracks. Where efflorescence has occurred or is suspected painting on this area shall be deferred for as long as possible.
17. Woodwork to be clear finished - stop holes, rub down with abrasive paper, dust off.

18. The contents of all cans and containers must be properly and thoroughly stirred before use and shall be suitably strained as and when necessary.
19. Unless otherwise described all coatings shall be applied by brush. Written permission must be obtained for the application of coatings by spray or roller where not so described.
20. Structural steelwork not encased with concrete shall be primed at works wherever possible. Surfaces subsequently inaccessible to the brush shall be painted two coats bituminous paint before fixing.
21. All coatings shall be allowed to dry thoroughly before succeeding coats are applied.
22. All undercoats for oil paints and clear finishes shall be rubbed down to a smooth surface with abrasive paper and all dust removed before the succeeding coat is applied.
23. Each succeeding coat of priming and undercoating paint shall be sufficiently different in colour as to be readily distinguishable.
24. Adequate care must be taken to protect surface while still wet, by the use of screens and 'wet paint' signs where necessary.
25. Care must be taken when storing materials, preparing surfaces or painting, etc., not to damage or stain other work. The Contractor shall remove all such stains, make good and touch up.
26. All brushes, tools and equipment shall be kept in a clean condition and surfaces shall be clean and free from dust during painting. Painting shall not be carried out in the vicinity of other operations which might cause dust. The Contractor shall provide a suitable movable receptacle, into which are to be placed all the liquids, slop washing, etc., which are on no account to be thrown down any of the gullies, manholes, sinks, lavatories, WCs or any other sanitary fittings. All solid refuse or inflammable residues must be removed from the site or burned.