Ref. PM / N.S1700052
Date: April 2018

Dunbar Boardman

SPECIFICATION

FOR

THE REPLACEMENT OF FOUR, MACHINE ABOVE, PASSENGER LIFTS WITH TRACTION MRL LIFTS LOCATED AT

QUEENS COURT
BARRACK ROAD
NEWCASTLE UPON TYNE
NE4 6BN

Prepared by: Phil Mantey MSc Regional Director Date December 2017

Checked by: Peter Forster Consultant . Date: December 2017

Client :

Your Homes Newcastle Limited
Newcastle Civic Centre,
Barras Bridge,
Newcastle Upon Tyne.
NE1 8PR

Dunbar Boardman

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Dunbar Boardman

INSTRUCTIONS TO TENDERERS

SECTION 1

Dunbar Boardman

1.0 INTRODUCTION

1.1 Précis of Project

Queens Court consists of a number of privately owned and social housing homes in four low rise blocks and has 4 single passenger lift installations.

Queen Court was constructed in the 1950's and the original lifts were modernised in 1982 by The Express Lift Company. The existing lifts are single speed; machine room above traction lifts.

This project comprises the removal of Four Machine Room Above Passenger lift and the replacement with Machine Roomless [MRL] Passenger Traction Lifts to a Vandal Resistant Cat 1 standard to BS EN 81-71 in accordance with the requirements of this specification.

The project includes all builders and electrical works associated with the replacement of the lifts where necessary plus all making good.

The lifts are required to comply with the requirements of EN 81-20 and 50 for which the structure provides adequate space provision.

The proposal is to replace two lifts at a time in independent blocks.

1.2 Completion of Documents

All information requested in the Invitation To Tender [ITT] Documents is to be provided by the Lift Contractor and submitted with the Tender together with any other supporting information requested in this document. Failure to provide this documentation may render the tender inadmissible.

1.3 Implementations

No guarantee can be made that the project will proceed as planned or that it will not be postponed or cancelled and the Employer does not bind himself to accept either the lowest or any Tender. No claim by Lift Contractor for any expenses, loss of profit or other such consideration incurred in the preparation of their Tender will be accepted.

1.4 Alterations

Any alterations to the text of these documents will not be accepted and any unauthorised alterations or qualifications will be disregarded and may result in disqualification of the tender. Any conditions that may be printed on the Lift Contractor's letter paper which may accompany the tender will not be accepted and any such conditions are deemed to be waived by the Lift Contractor unless specifically noted in the accompanying letter and agreed in writing by the Engineer.

1.5 Qualifications

Within this Specification are indicated the requirements of the project. Where the Lift Contractors tender for carrying out the work is based on any deviations from the specification in respect of any materials, method of installation, performance, builders work or the like which is due solely to the Lift Contractors own standard design requirements, such deviations shall be clearly set out in a covering letter or schedule to be submitted with this tender. Technical deviations will penalise the tender score. In the absence of such a covering letter or schedule it will be deemed that the price quoted by the Lift Contractor includes for the whole of the work to be carried out as specified herein and no such later requests for deviations will be considered.

1.6 Corrections

Lift Contractors are requested to take extreme care in the completion of the tender documents, but if errors do occur, the person signing the Form of Tender shall initial the correction and under no circumstances should correction fluid be used.

1.7 Bona Fide Tender

The Lift Contractor must undertake that he has not communicated and will not communicate to any person under any agreement or arrangements to do so the amount of this Tender, and that the amount of this tender has not been adjusted under any agreement or arrangement with any persons so to do.

1.8 Method Statement

The Lift Contractor is to provide with their offer, a method statement detailing his proposed approach to this project, including off site manufacturing, delivery, dismantling, removal, installation, maintenance, supervision and management. This method statement shall include an organisation chart indicating the key personnel, including their names and line responsibility from Board Director through to Site Charge hand.

1.9 Risk Assessment (CDM)

The project will fall under the Construction (Design & Management) Regulations 2015 and the Lift Contractor shall provide with his offer, his risk assessments, COSHH data, Safety Policy and hierarchy of responsibility along with his accident records under RIDDOR for the past 3 years.

1.10 Lifts Regulations

The Lift Contractor shall include for the lifts to comply fully with the Lifts Regulations; as amended for compliance with 2014/33/EU including seeking the approval of a Notified Body for any variation against the relevant parts of the BS EN81 20 and 50 Harmonised Standards. All costs associated with this shall be included within the Tender.

1.11 Site Survey

It is a condition of tender that the contractor undertakes a survey of the site to establish the pertinent dimensions, access and delivery routes pertinent to pricing the tender. Requests for accompanied access shall be made to :-

Mark Riley,
mark.riley@yhn.org.uk

1.12 Site addresses

QUEENS COURT
BARRACK ROAD
NEWCASTLE UPON TYNE
NE4 6BN

PRELIMINARIES AND CONDITIONS OF CONTRACT

SECTION 2

2.0 CONDITIONS OF CONTRACT

2.1 CONDITIONS OF CONTRACT

The Conditions of the Contract will be issued by the enquirer with the invitation to tender under a separate document.

2.2 Preliminaries

The Contract Preliminaries will be issued by the enquirer with the invitation to tender.

The following information is supplementary information to the Contract Preliminaries .

Description of the Works

The works comprise of the removal of four machine above traction lifts ; and the installation of four Machine Roomless Traction Passenger Lift in accordance with the requirements of EN 81-20 & 50 and this specification together with associated builders and electrical works. .

Definition of Terms

Employer	Your Homes Newcastle .
Main Contractor	The Lift Contractor will be the Principle Contractor.
Purchaser	Your Homes Newcastle
Quantity Surveyor	None
Contract Administrator	Your Homes Newcastle
Engineer	TUV-SUD Dunbar and Boardman
Lift Consultant	TUV-SUD Dunbar and Boardman
Structural Engineer	NA
M & E Engineer	NA
Principle Designer	TUV-SUD Dunbar and Boardman
Principal Contractor	Will be the appointed Lift Contractor.

Programme

The works will take place in Autumn 2018 with two lifts being replaced in independent blocks at any one time .

The contractor is to provide a simple bar chart programme with their tender to show the procurement time , from time of receipt of order to time of commencement on site and the programme for each lift.

Tender evaluation will take into consideration programme in addition to compliance with specification, energy efficiency, disabled accessibility and financial competitiveness.

The Lift Contractor shall be responsible for the complete programming of all sub-contractors before and during their work on site; he will also be responsible for organising meetings as and when necessary with the various sub-contractors.

The Lift Contractor shall provide, within 6 weeks of appointment, a detailed bar chart programme for both off and on site works showing the items detailed in the production schedule and schedule of site works contained in Section 10 of this specification. This shall be updated throughout the works as a progress report at the frequency required by the Engineer.

Site Conditions

The red squares show the approx. locations of the lifts.

The initial pedestrian access to the building is available via the door of the building adjacent to the lift core.

Pedestrian and equipment access is available via the door near to the lift.

Site Storage

The contractor shall allow for the provision of a 6m x 2.5m container which may be located in various locations to suit the lift being replaced. This may include next to the boiler house access or in parking bays near to the lift with the consent of the local authority and payment of all and any fees associated with the temporary use of parking bays to site containers.

All costs associated with the provision of , relocation of , and siting of Containers shall be included in the contract sum.

Car Parking

No contractor's vehicles will be allowed to be parked on site during the works.

Delivery vehicles shall be arranged to visit the site at times agreed with the management so as not to block access to the adjacent buildings.

Public car parking exists on local streets nearby.

Site Management Costs

Provide for all on and off site management costs including cost for the chargehand in charge.

Labour on-cost

Provide for all on-costs in respect of all workmen for disbursements arising from the employment of labour.

Hours of Work

The hours of work will be as shown on the Schedule of Site Works incorporated in the Contract to meet the required programme. Additional working hours will be allowed by agreement with the Engineer. The Contractor will allow for out of hours works associated with the achievement of the programme for this site.

All major materials movements in and out of the lift well and machine room shall be programmed for outside of core building hours and thus outside of the Contractors normal working hours , with no additional charge to the contract.

2.3 QUALITY AND TOLERANCES

2.5.1 Guide Rails

On passenger lifts only 5 m guide lengths shall be used and surveys used to determine the access prior to design.

The rails shall be plumb to + 6mm in verticality and + 3mm in distance between guide rails.

The Lift Contractor to demonstrate accuracy of alignment as part of the witness test, as detailed in Section 8.

2.5.2 Structural Tolerances

The lift shaft is existing and the lift contractor must satisfy himself of the existing dimensions and include all necessary fixings, brackets etc., to install his equipment within these conditions.

2.4 Regulations and Quality of Work

Refer to the Tender Documentation and the relevant clauses within this Specification.

The completed installation shall comply in all respects with the latest current editions of the following British Standards, including the Draft Standards noted where applicable :-

a)	BS476	Fire tests on building materials
b)	BS5499	Fire safety signs
c)	BS5588	Fire precautions Part 5, Part 8 and Part 10
d)	BS5655	Lifts & Service Lifts Parts 1 – 14 inclusive, where relevant
e)	BS7255	Safe Working on Lifts
f)	BS7671	The IEE Wiring Regulations (17th Edition)
g)	BS8300	Design of Buildings to meet the needs of the Disabled
h)	BSEN81-20,	Safety Rules for the construction and installation of lifts

i)	NSEN81-21	New passenger and goods passenger lifts in existing building
j)	BSEN81-28	Remote Alarms on Passenger and Goods Lifts
k)	BS EN 81-50	Design rules, calculations examinations and tests of lift components
l)	BSEN81-58	Landing door fire tests
m)	BSEN81-70	Disabled persons accessibility
n)	BSEN81-71	Vandal Resistant Lifts
o)	BSEN81-73	Behaviour of lifts ion the event of fire
p)	BSEN81-80	Improvement of safety of existing passenger & goods lifts
q)	BSEN12015&16	Electro magnetic compatibility
r)	BSEN12385-4&-5	Steel wire ropes
s)	BSEN13015	Maintenance for lifts and escalators
t)	BSEN13857	Safety of machinery. Safety distances to prevent hazard zones being reached by upper and lower limbs
u)	BSEN50214	Flexible cables for lifts
v)	BSEN50265-1	Tests on electric cables under fire conditions
w)	BSENISO16032	Acoustics – Measurement of sound pressure levels from service equipment in buildings
x)	BSENISO12100-1	Safety of Machinery: Basic concepts, General principles for design
y)	BSISO18738	Measurement of lift ride quality
z)	BS8486.	Specification for testing of Lifts

The Works shall comply with the following Acts, Regulations and Working Rules:

a) The Construction (Lifting Operations) Regulations.

b) The Construction (General Conditions) Regulations.

c) The Construction (Health & Safety) Regulations.

d) The Construction (Work in Places) Regulations.

e) The Factories Act and all amendments thereto.

f) Health & Safety at Work Act.

g) The Electricity at Work Act.

h) The Provisions and Use of Work Equipment Regulations.

i) The Work Place (Health, Safety & Welfare) Regulations.

j) The Construction (Design & Management) Regulations.

k) The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations

l) The Lifts Regulations.

m) The Lifting Operations and Lifting Equipment Regulations.

n) The Building Regulations Part M2 and subsequent updates.

o) The Equality Act 2010

p) The Work at Height Regulations 2005

q) The Control of Noise at Work Regulations 2005

r) The Waste Electrical and Electronic Equipment Regulations 2006.

2.5 Site Inspection

The Lift Contractor shall be deemed to have satisfied himself as to the local conditions with regard to accessibility of the site, the full extent and nature of the works, the supply of and conditions affecting labour, messing, toilets, carriage, cartage, unloading, tools, accommodations, scaffolding, hoisting, cranage, ladders, and anything which may influence his tender for carrying out the works.

2.6 Component Life

All major components such as contactors, any relays, push units, indicators, call-accepted indicators, door operator, locks, shaft switches etc., shall have been type tested to a minimum of 1 million operations.

Contractor to state the expected life of solid-state components.

2.7 Product Guarantee & Warranties

Product guarantee and warranties provided by the Lift Contractor or his suppliers shall be valid or extended up to the end of the defects liability period as a minimum.

Any product guaranteed or warranted by a supplier for a period of time that extends past the end of defects liability period shall remain under warranty or guarantee up to the end of the extended period.

Copies of all guarantees or warranties shall be provided in the Operation and Maintenance Manuals as described in Section 8.

CDM REGULATIONS

SECTION 3

3.0 CDM REGULATIONS

3.1 PRE TENDER HEALTH & SAFETY INFORMATION

3.1.1 Construction (Design and Management) Regulations

The Project will be undertaken in accordance with the Construction (Design & Management) Regulations 2015.

The Lift Contractor will be expected to fulfil the duties of the Principal Contractor as set out in the CDM Regulations 2015 and associated HSE Guidance. The attention of the Lift Contractor is drawn to the requirements arising under Regulations 8, 9, 10, 11, 12, 13, 14, 15 and Part 4 of the Regulations.

The Lift Contractor shall not commence any construction work until he has developed the Construction Phase Health & Safety Plan in accordance with the requirements of Regulation 12. The completed plan shall be issued to the Principal Designer in sufficient time to allow for comment prior to commencement of the works.

The Lift Contractor shall ensure that all direct appointments that he may make in his capacity as Main Contractor or Construction Manager include provisions for the compliance of his trade or sub-contractors, suppliers and Designers with the relevant provisions of the CDM Regulations.

3.1.2 Preconstruction Phase Health & Safety

Client:	Your Homes Newcastle
Address:	Newcastle Civic Centre Barras Bridge Newcastle Upon Tyne NE1 8QH
Principal Designer & Engineer	Tuv Sud Ltd Dunbar & Boardman Cobalt 3.1, Silver Fox Way, Cobalt Business Park, Newcastle upon Tyne NE27 0QJ
Location of Works:	Queens Court Barrack Road Newcastle Upon Tyne NE4 6BN

Provide for all costs incurred by complying with and implementing statutory obligations in respect of Safety, Health and Welfare Regulations, including the Construction (Design & Management) Regulations 2015 appertaining to all personnel (including those employed by nominated sub-contractors) whose duties require them to be on the site.

The Lift Contractor shall cooperate with the Principal Designer and other Designers and Contractors, including the prompt provision of design and other information, and information required for the Health & Safety File, such as to meet the duties of Principal Contractor arising under the CDM 2015 Regulations.

3.1.3 Project

The Project comprises :-

The removal of 4 existing machine above traction lifts and their replacement with gearless machine roomless traction Passenger to A Cat 1 Standard to BS EN 81-71 as detailed in this specification.

The works on two independent lifts will be undertaken simultaneously.

The project includes the removal of the redundant equipment lift and all associated Builders & Electrical Works.

3.1.4 The Existing Environment

Queens Court consists of a number of privately owned and social housing homes in low rise blocks and has 4 single passenger lift installations.

Queen Court was constructed in the 1950's and the original lifts were modernised in 1982 by The Express Lift Company. The existing lifts are single speed; machine room above traction lifts.

The lifts serve vertical cores where the lobby is partially enclosed from the elements.

3.1.5 Machine Room Equipment

All of the machine room equipment shall be removed from the machine room as part of the works.

The whole of the lift equipment shall be removed and the room will be handed over for storage use.

3.1.6 The Design

The Design of the Works is detailed elsewhere within this Specification.

The principle of the Design is to achieve, as far as is practicable, a lift installation in accordance with current British Standards, the health and safety provisions contained within those Standards, current Regulation and the general requirements of the Health & Safety at Work Act 1974, together with all of the provisions of this Specification.

The Lift Contractor shall record and highlight on the construction drawings, including appropriate detail, all significant hazards and risks associated with the construction works which have not been eliminated and/or adequately mitigated in the Design of the Works.

The Lift Contractor shall record details of any significant residual hazards and risks affecting the Works and the Design, which could not be eliminated and/or adequately mitigated in the Design, on the final "as fitted" record drawings and in the H&S File.

3.1.7 Construction Materials

The components and materials will include electrical and mechanical elements and construction materials which have been designed and manufactured to ensure reliable performance and service life and to minimise or eliminate risks.

The removal of any combustible or hazardous material will require that the necessary Health & Safety precautions be applied, as detailed in the COSHH Regulations.

Before any dismantling of machines is undertaken redundant mineral oil is to be removed into sealed containers which are designed, constructed and labelled in accordance with the COSHH Regulations.

All new materials and components utilised in the Works are to be properly designed and manufactured to suit their purpose and capable of providing reliable operation throughout the Service Life. Where materials are detailed in the Specification the Lift Contractor shall utilise these or, if permitted and agreed in writing, approved equivalent alternatives.

Redundant materials shall become the property of the Lift Contractor to dispose of in a responsible manner taking due regard of applicable legislation and codes. These are to be removed from site expeditiously to an approved disposal site. The accumulation of rubbish/debris is not permissible except in designated storage areas, and then only if properly bagged and labelled. The Lift Contractor shall incorporate evidence of correct disposal which is to be retained within the H&S File.

All new materials are to be delivered as required and stored in approved storage areas, and shall be protected such as to prevent damage, and to protect persons from injury.

3.1.8 Site Waste Management

The Lift Contractor shall, if and when required, produce a Site Waste Management Plan (SWMP) PRIOR to commencement of construction works.

The Lift Contractor shall adopt the SWMP and ensure compliance with the Environmental Protection Act 1990 (EPA), and the CDM Regulations 2015.

3.1.9 Suitability of Material and Products

The Lift Contractor shall use materials and products which:

a) Are new unless specified otherwise
b) Are suitable for the services and conditions of use normally expected to apply after the installation is complete.
c) Are able to withstand the testing and commissioning conditions specified.
d) Do not initiate mould growth, support vermin, contain animal hair, contain crocidolite or support bacterial life.
e) Do not involve the use of CFC's at any stage of manufacture, installation or subsequent operation except where specified.
f) Are free from objectionable odours of the maximum or normal working conditions of operation.
g) Do not suffer deterioration at the maximum or specified conditions of operation.
h) Are capable of being applied to a base surface without causing damage or deterioration of the base.
i) Are not a fire hazard, and do not evolve dense or toxic fumes when subjected to excessive heat, such as a fire.
j) When of similar type, are made by the same manufacture.
k) Are, where applicable, in compliance with the provisions of the Construction Products Regulation 2013.
l) Whenever possible ensure products are manufactured and/or stocked under one of the following;

BSI Kite Mark Scheme
BSE Safety Mark Scheme
from Firms of Assessed Capability to BS ISO 9000
from Stockists of Assessed Capability to BS ISO 9000

3.1.10 Deleterious Materials

No material generally known to be deleterious are to be used in, or incorporated into, any temporary or permanent Works forming part of the Project.

In particular none of the following items are to be used

- Asbestos or asbestos based products

- Urea formaldehyde or materials which may release formaldehyde in quantities which may be hazardous with reference to the limits set by the HSE
- Material containing fibres less than three microns diameter or 200 microns long
- Lead or any material or product containing lead which may be ingested, inhaled or absorbed
- Polychlorinated biphenyl
- Fibres not sealed or otherwise stabilised to ensure that migration is prevented
- Vermiculite containing fibrous dust
- Polytetrafluoroethylene (IPTFE) except for pipe work jointing
- Calcium silicate bricks or materials

Any other products or materials which are generally known within the Building Industry to be deleterious or hazardous to health or safety or to the durability of the property in the circumstances in which they are used.

- High alumina cement and/or concrete
- Wood wool slabs used as permanent shuttering
- Calcium chloride in admixtures for use in reinforced concrete
- Sea-dredged aggregates for use in reinforce concrete which do not comply with current British Standards
- Aggregates for use in concrete which do not comply with current British Standards
- Alkali reactive aggregates

The Lift Contractor shall check with the manufacturers and/or suppliers of products and materials that any specified product contains such material. If it does, then the Lift Contractor shall request approval of an alternative.

3.1.11 Anticipated Target Programme

The programme will be agreed between the Lift Contractor and the Engineer in order to minimise inconvenience. It is anticipated that the Works will commence on site in June 2018 to remove the first two of the existing lifts and prepare the lift wells for the replacement lift prior to the delivery of the replacement lift equipment.

The Lift Contractor shall confirm with his Tender the best possible material procurement/delivery periods and installation times which he is able to achieve.

It is anticipated that the following key dates should be achievable:

Return of Tenders:-	May 2018
Purchaser order to Lift Contractor:-	June 2018
Initial Lift Contractor's design and production of drawings:-	July 2018
Lift Contractor's completion of Construction Phase H&S Plan:-	August 2018
Start site works	October 2018
Delivery of materials:-	October 2018

Completion of first two lifts (within 8 weeks of start) End November 2018

Completion of second two lifts (within 8 weeks of start) May be deferred until after Christmas

ANY IMPROVEMENT ON THIS PROGRAMME SHALL BE SCORED ACCORDINGLY

3.1.12 Site Wide Elements

The lorry access to the site shall be via A189 Barrack Road , Stanhope Street and Derby Street.

The offloading must be arranged so as not to restrict the flow of traffic on Barrack Road or Stanhope Street.

Due to the limited space available, the Lift Contractor shall be required to limit his area of operations to the motor rooms, shafts and any hoarded area of the landings.

Provide and display in the appropriate position, all necessary signs in accordance with the Ministry of Transport system of advance warning signs, as required by the Policy Authority and the responsible Highway Authority. Include for all costs and charges for complying with all other regulations and directions, including obtaining Police permission for any road closure, cranes etc., and all associated costs.

Toilet and washing facilities are available in the building.

Provide for taking reasonable precautions to prevent workmen, including those employed by sub-contractors, from trespassing on adjoining owner's property or any part of the premises that are not affected by the Works.

3.1.13 Workplace (Health, Safety and Welfare) Regulations

The Workplace (Health, Safety and Welfare) Regulations 1992 (WHSWR) cover a wide range of basic health, safety and welfare issues such as ventilation, heating, lighting, workstations, seating and welfare facilities. If the structure will ultimately be used as a workplace, the finished design will need to take account of the relevant requirements of the WHSWR.

3.1.14 The Extent and Location of Existing Records & Plans

No architectural/structural drawings are available relating to the lift well or motor room. The Lift Contractor will, therefore, be expected to undertake his own detailed survey of the existing situation of the lift well, lift motor room and associated structure (particularly in relation to the loads imposed and available clearances) and shall visit the site and ascertain for himself the nature and extent of the works and the conditions under which they are to be executed.

No claim by the Lift Contractor for additional payment shall be allowed, on the grounds that he did not or could not foresee any matter, which may in fact affect or have affected the execution of the works.

The Lift Contractor shall be responsible for providing general arrangement and setting out and construction drawings for the refurbished lifts, as part of the project detailed within the Specification, as well as any additional drawings required for any authorised bodies.

3.2 CLIENT'S CONSIDERATIONS & MANAGEMENT REQUIREMENTS

3.2.1 Planning & Management of the Construction Works

The Client has appointed Dunbar & Boardman, who are lift consultants experienced in the design, specification and management of lift installation and replacement works, to undertake the performance specification and management of the project. Key safety goals are:

- No accidents to employees, residents, contractors, subcontractors or members of the public
- No safety related incidents
- A completed lift installation, suitable for use by disabled persons, that can be used, maintained and operated safely throughout its operational life
- Compliance with the requirements of the Lifts Regulations 2016 and EU Lifts Directive 2014/33/EU; and Harmonised Standards BS EN81-20 & 50: 2014; and BS EN81-70: 2003
- Handover of a Health & Safety File comprising a complete set of CDM, Design and O&M documentation to the Client on completion of the works

3.2.2 Communication & Liaison between the Client & Others

The Principal Contractor and his Contractors will, at all times, comply with the agreed Health & Safety procedures which have a direct effect on the Health & Safety of personnel throughout the installation period of the Contract. Any additional requirements with respect to emergency procedures etc. will be discussed/agreed with the CDM Principle Designer and Engineer prior to starting site works.

Method statements and continuing re-evaluation of work sequences will be required to be implemented minuted and the Health & Safety file amended accordingly during the installation period.

Where unforeseen eventualities might occur during the project installation, the Principal Contractor will provide a suitable system that can be implemented to meet the requirements of the design change, including all assessments of any hazards involved and the necessary communication and liaison to minimise the effect, both materially and with respect to human resources.

The Lift Contractor shall include for attending regular site meetings, the anticipated time scale will normally be once every two weeks, but the actual timing of such meetings will be as required by the Engineer.

The Lift Contractor/Principal Contractor will be responsible for ensuring that all his engineers, operatives, and sub-contractors are fully trained and made conversant with the required Health & Safety procedures and requirements, before they commence any operations on site. A register of inductions and tool box talks shall be included in the Health & Safety Plan.

3.2.3 Overlap with Clients' Undertaking

The Building will remain occupied during the course of the works on site. The Lift Contractor must ensure that his engineers are aware of the requirements for safe access and protection of work areas.

The Lift Contractor shall protect, uphold and maintain all underground services and overhead lines during the execution of the works. The Lift Contractor shall safeguard all reference points which indicate the presence of an underground service and the Lift Contractor will be liable for any damage due to any cause within his or his sub-contractor's control which is occasioned to any service or marker and is to pay any charge for making good.

The Lift Contractor shall comply fully and in all respects with the statutory requirements of the Control of Pollution Act 1974 and the Control of Noise at Work Regulations 2005. The use of noisy items of plant, such as percussion drills and angle grinders, whilst permissible, must be kept to a minimum and it may be necessary for these activities to be carried out outside the normal working hours of the building. Sufficient controls or working methods shall be applied to ensure that the risks (of exposure to high noise levels) to the Lift Contractors employees, Sub-contractors or other persons likely to be affected, are reduced to as low a level as reasonably practical. The timing of all activities where a high level of noise output cannot be avoided must be agreed with the Engineer prior to commencement. At no time will the use of personal radios be allowed.

The Lift Contractor shall provide for taking reasonable precautions to prevent workmen, including those employed by sub-contractors, from trespassing on adjoining owner's property or any part of the premises that are not affected by the Works.

3.2.4 Security of the Site

The element of the construction site comprising the lift well and entrances will be secured behind robust protective hoardings fixed to the structure of the building. These will be checked daily by the Principal Contractor.

The access to the site shall be via the ground floor entrance. All protection to finishes and personnel is the Lift Contractor's responsibility. The floors at each level shall be protected using hardboard or equal, hazard taped to avoid tripping hazards.

The access way to the lift from the fire exit shall be fitted with non-flammable floor protection.

The existing machine room will be available to the Principal Contractor's operatives as secure areas for the temporary storage of tools etc. during the course of the works.

The Lift Contractor must:-

Safeguard the Works, materials and plant against damage, theft or vandalism, including all necessary lighting for the security of the Works and the protection of the public.

Provide for carefully covering up and protecting all fixed or unfixed items of equipment throughout the duration of the Works until hand-over. Any equipment, which has become tarnished, rusty, degraded or damaged in any way whatsoever, will not be accepted and shall be replaced at the Lift Contractor's cost.

Provide for removing all rubbish from the site, both as it accumulates and at completion, including the removal of all temporary works associated with the provision of plant, signboards, temporary roads, temporary hoarding and temporary buildings. Any disruption as a result of the foregoing shall be made good and all packing cases and packing material shall be removed from site immediately the equipment has been unpacked. All materials shall be disposed of at an approved site and evidence provided for retention in the Health & Safety file. Upon completion of the Works, the site shall be fully re-instated to its original condition.

Make adequate provision to protect the decorative finish to floors, walls and ceilings and areas adjacent to the Works from damage, accidental or otherwise, which could be occasioned during the course of the Works. Any damage, which does occur, must be re-instated to the satisfaction of the Engineer.

Ensure that all portable appliances brought to site shall be tested and marked in compliance with Current Regulations.

Ensure that all lifting tackles, slings etc., shall be tested and marked in line with Current Regulations.

Ensure that all scaffolding used shall be correctly installed to the Current Regulations by an authorised person and shall be inspected, tagged and a register kept on site. Authorised persons only shall carry out adaptations.

The Lift Contractor's employees and sub-contractors are to be issued with photographic ID cards to the Engineer's approval, which will be valid for the duration of the Works. These passes shall be carried at all times and entry to the building will be refused if a valid pass cannot be produced (per Contract).

The Lift Contractor shall also comply with any other security measures that the Purchaser may impose during the Works.

3.2.5 Welfare provision

The contractor will be provided access to shared welfare facilities on site.

If the opportunity to use a vacant apartment for welfare provision the client may offer this as available however no guarantees that an apartment will be available for the duration of the site works in full or in part .

3.2.6 Site Hoarding Requirements

The Principal Contractor will install robust protective hoardings as detailed elsewhere in this specification.

Entrance protection shall be provided by the Contractor in accordance with Section 4 of this specification.

It is imperative that any protection hoarding, barriers and work screens are maintained in a sound and secure condition at all times, with any doors kept securely locked, except when the Lift Contractor's Engineers or Sub-Contractors are working in the immediate vicinity.

3.2.7 Site Transport Arrangements & Vehicle Movement Restrictions

The Lift Contractor's attention is drawn to the fact that he is to restrict the flow of vehicles to times as agreed with the Engineer and must allow, in his tender, for taking all necessary precautions to protect the occupants of the building and the general public and maintain access at all times.

The only form of site transport envisaged is that of delivery vehicles to the exterior car park of the property and small handling trolleys within the building. Delivery of large assemblies or components shall be co-ordinated with the Engineer/client representative. Offloading and vehicle movement shall be supervised at all times by the Principal Contractor and undertaken during periods of low usage of the areas.

The Lift Contractor shall provide and display in the appropriate position, all necessary signs in accordance with the Ministry of Transport system of advance warning signs, as required by the Policy Authority and the responsible Highway Authority. Include for all costs and charges for complying with all other regulations and directions, including obtaining Police permission for any road closure, cranes etc., and all associated costs.

3.2.8 Client Permit to Work System

The Client operates a permit to work system and the Principal Contractor will be expected to manage and monitor access to the work area for the lift and ensure that all operations are conducted in accordance with his own safe working system.

3.2.9 Fire Precautions

The fire alarms and procedures will be reviewed with the Principal Contractor at a pre-start meeting to be held with the Engineer and Client's representative. The Principal Contractor shall provide fire extinguishers appropriate for any Hot Works. Any Hot Works shall be properly supervised and only undertaken after times and durations for such work have been advised/agreed with the Engineer.

No oxyacetylene or electrical welding shall be used on site equipment on site.

The Lift Contractor is to ensure that proper safety precautions, in compliance with good practice and statutory requirements are maintained in force, for the duration of the use of all equipment.

3.2.10 Client Hot Works system

Details of the Clients Hot Working Permit System shall be presented to successful lift contractor at the pre start meeting.

3.2.11 Emergency Procedures & Means of Escape

Emergency procedures, means of escape and nearest first aid facilities will be reviewed at the pre-start meeting.

3.2.12 No-go areas & other specific authorization requirements

Due to the limited space available, the Lift Contractor shall be required to limit his area of operations to the motor rooms, shafts and any hoarded area of the landings. The roof is out of bounds.

The Lift Contractor's normal access areas will be limited to the motor rooms, wells, entrance lobbies and immediate staircase, as well as the washroom facilities. All operatives shall restrict their access to the generally agreed site access and working areas.

The area of the shaft pit, motor room and hoarding shall be designated hard hat areas and the Lift Contractor shall ensure all his employees or sub-contractors are issued with and wear hard hats whilst working in these areas. Adequate spare hats shall be available on site for visitors.

3.2.13 Confined Spaces

No confined spaces in the regulatory sense are envisaged. In cases where work is to be undertaken at the head of the lift well, or in the lift pit, where access and egress may be inhibited the Principal Contractor shall establish provisions for communication and rescue.

3.2.14 Smoking

In compliance with The Smoke-free (Premises & Enforcement) Regulations 2006, which came into force on the 1st July 2007, the building operates a "No Smoking" policy. The Lift Contractor shall ensure that his employees or sub-contractors' employees do not allow smoking within the building or land.

3.2.15 Site Rules & Discipline

The Lift Contractor shall comply with the Client's Building Rules which shall be issued to the successful contractor.

The Lift Contractor shall, at all times, ensure that his employees, whether for installation works or service work, act in a responsible manner whilst on the Client's premises.

The Lift Contractor shall ensure that all employees and sub-contractors are issued with, and wear at all times, personal protective equipment. This should comprise, as a minimum, overalls bearing the company name or logo, safety footwear, eye protection, hearing protection and hard hat.

Each of the Lift Contractor's employees who are required to visit the premises are expected to carry identification which must be produced on request to duly authorised representatives of the Client.

The Client reserves the right to refuse access to or to reject any of the Lift Contractor's employees or sub-contractors in the event that their actions are considered to be disruptive or detrimental to the operation of the premises or to the progress of the Works.

The Lift Contractor shall ensure that all work areas are left safe and secure following completion of each day's work, with all access keys returned to the Client's Representative.

3.2.16 Construction Skills Certification Scheme

All the Lift Contractor's engineers and sub-contractors shall have passed the relevant level of CSCS test and be in possession of a valid card.

The Lift Contractor must refuse access to any operative who is not carrying a valid card.

3.2.17 Parking Restrictions

There is no facility for Contractor on-site parking although public car parking is available nearby the site.

3.3 ENVIRONMENTAL RESTRICTIONS & EXISTING ON-SITE RISKS

3.3.1 Safety Hazards

Known potential existing safety hazards and environmental restrictions to be taken account of and addressed by the Principal Contractor in his Construction Phase H&S Plan are as follows:

- Loading, off-loading and distribution of materials will be undertaken in areas accessible to public , site visitors or residents.
- Limited space is available for vehicle manoeuvring and turning.
- The oil in the existing gears is to be drained and removed from site under a waste transfer notice and a waste disposal certificate obtained for it.
- Limited storage space is available and redundant materials are to be removed on a daily basis.
- Attendance is to be provided to the Fire alarm Contractor to replace the wiring for the fire alarm smoke detector at the top of the lift shaft and provide a fire alarm interface unit.

3.3.2 Health Hazards

Asbestos

The owner of a building (or designated 'Duty Holder') has a duty under the Control of Asbestos at Work Regulations (CAWR) 2002 to compile an asbestos register. The HSE publication 'Methods for the Determination of Hazardous Substances' MDHS 100 describes suitable methods for the surveying, sampling and assessment of asbestos containing materials. It recommends the owner to commission an independent expert to conduct a MDHS 100 'Type 3' survey in order to compile a written record of the type and location of the asbestos materials that may be present in the building so that the risk may be managed.

Where it is likely that the building is of an age where asbestos may be found (pre 1985 for brown & blue; pre 1999 for white), the asbestos register and associated risk assessment documents shall be provided by the Client. The Lift Contractor shall take appropriate measures to manage any residual risk prior to work commencing.

Clear and explicit instructions must be issued by the Lift Contractor to all his employees and sub-contractors involved with the works on site, that if during the course of the works material is encountered which it is reasonably suspected may contain any form of "asbestos", they must respond as follows:-

a) Cease work in the vicinity of the suspect material immediately.
b) Report immediately by telephone; confirm by facsimile within two hours to the ENGINEER.
c) Do not recommence work until instructed to do so by the ENGINEER.

d) When carrying out the pre-tender survey, a detailed inspection to identify any asbestos present must be carried out and the Engineer informed of the findings.

Roof Aerials/Masts/Microwave Dishes

There may be roof mounted antennae on the access route to the machine room. When carrying out the pre-tender survey, a detailed inspection to identify any radio masts, microwave dishes/antennae must be carried out and the Engineer informed of the findings.

The Lift Contractor must ensure that all personnel follow the instructions on the warning signs, observe any exclusion zones and keep to the prescribed access route.

If unmarked radio masts, microwave dishes/antennae are later discovered, evacuate from the area and carry out a hazard analysis. Take suitable action to avoid exposure to high levels of microwave radiation. Only proceed if satisfied that the access route is safe or that additional precautions sufficiently reduce any residual risk. If the route remains a high risk and no alternative means of access is available, the Lift Contractor must respond as follows:-

a) Cease work in the vicinity of the perceived hazard.
b) Report the nature of the risk by telephone to the ENGINEER.
c) Do not recommence work in that area until instructed to do so by the ENGINEER.

3.3.3 KNOWN EXISTING HAZARDS

Known potential existing health hazards to be taken account of and addressed by the Principal Contractor in his construction phase plan are as follows:

Asbestos

There is no confirmed asbestos present in the work areas or equipment covered by this project (refer to asbestos register available from the Client).

A pre-construction asbestos survey will be undertaken by the client.

Any Asbestos present in the well will be removed where it is confirmed by a pre construction survey prior to commencement on site of the lift works.

However, clear and explicit instructions must be issued by the Principal Contractor to all operatives and sub-contractors involved with the works on site, that if during the course of the works material is encountered which it is reasonably suspected may contain any form of asbestos, they must respond as follows:-

- Cease work in the vicinity of the suspect material immediately.
- Report immediately by telephone; confirm by facsimile within two hours to the Engineer.
- Do not recommence work until instructed to do so by the Engineer.

Gear Oil

The existing gear units, contain lubricating oil, which will require appropriate protective clothing, gloves etc. to be worn by operatives handling the removal of the redundant equipment. All oil must be disposed of in accordance with the relevant legislation and guidance.

Structural Stability of Staircase

No major loads shall be imposed upon the staircase for the removal of redundant materials from the machine room.

All equipment shall be broken down into components that can be removed by hand of not more than 20 kg and subject to a relevant risk assessment.

3.4 SIGNIFICANT DESIGN & CONSTRUCTION HAZARDS

3.4.1 Significant Design Assumptions (Work methods, sequences and other control measures)

The lift design shall be in compliance with the relevant parts of Harmonised Standard BS EN81-20 providing an assumption of compliance with the Essential Health & Safety Requirements of the Lifts Regulations 2014. The lift shall be subject to witness test in line with BS 8486-1:2007 Standard on completion. The lift replacement method is proprietary to the Lift Manufacturer and detailed installation method statements, risk assessments and layout drawings shall be provided by the Lift Contractor. These shall be incorporated in the Construction Phase Plan.

The removal of the existing redundant lift equipment shall be undertaken by the Principal Contractor's operatives who must be experienced in this type of work.

It is envisaged that the existing lift well equipment can be electrically isolated and the lift car suitably suspended, with a double set of tested lifting equipment, from the existing lifting beam, which shall be tested prior to use. The lift car could then be utilized as a working platform to dismantle equipment in the upper section of the lift well and lowered into the pit area for dismantling and removal from site via the rear property entrance.

It is envisaged that the lift machine room equipment can be isolated, mechanically and electrically disconnected and removed from site via the replacement lift car before handover . Full method statements, risk assessments and control measures are to be provided and agreed with the CDM Principle Designer /Engineer prior to commencement.

The associated builders and electrical work shall be undertaken by the Principal Contractor. It is envisaged that the works are to be undertaken using traditional construction trades working from a traditional scaffold structure or temporary platform installed within the lift well. The Principal Contractor shall provide detailed method statements and risk assessments for all builder's works tasks.

3.4.2 Coordination of Ongoing Design and Design Changes

It is envisaged that the Lift Contractor shall provide detailed lift design drawings together with details of the required builder's works alterations and any modifications to the lift well and lift motor room. These are to be reviewed and agreed with the Engineer. Any subsequent design changes which may arise are to be channeled through the Principal Designer/Engineer, recorded in the Construction Phase Plan, and detailed on the Construction and the final As-Built Drawings.

The Lift Contractor shall record and highlight, including appropriate detail, any significant hazards and risks associated with the Construction Works, which have not been eliminated and/or adequately mitigated in the Design of the Works, on the Construction Drawings.

The Lift Contractor shall record details of any significant residual hazards and risks affecting the Works and the Design, which could not be eliminated and/or adequately mitigated in the Design, on the Final "As Fitted" record drawings and in the H&S File.

3.4.3 Information on Significant Risks Identified During Design

- Refer to the Lift Contractors Design Risk Assessment for compliance with the Lifts Regulations 2016 and EU Lifts Directive 2014/33/EU.
- Refer to following TUV SUD Dunbar & Boardman indicative risk assessments.

3.4.4 Materials Requiring Particular Precautions

- Disposal of redundant gear oil.

3.5 PRINCIPAL CONTRACTOR CONSTRUCTION PHASE PLAN DEVELOPMENT

The Principal/Lift Contractor shall develop this Health & Safety Plan in accordance with Regulation 12 of the CDM 2015 Regulations.

A copy of the Construction Phase Health & Safety Plan shall be provided to the Principal Designer and Engineer prior to any such works starting, for approval.

During the course of the project, a copy of the Plan will be held on site by the Principal/Lift Contractor's Senior Engineer and shall be updated with any necessary amendments agreed during the regular site meetings.

At completion of the project, the Principal Contractor shall provide to the Principal Designer the Health & Safety information, including assessments of residual risks, for incorporating into the Health & Safety File and Operating and Maintenance Manuals, which are to be provided to the Client.

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3.6 THE HEALTH & SAFETY FILE

The Health and Safety File shall be produced by the Principle Contractor to the satisfaction of the Principle Designer and included as a section of the Owners Service Manual.

The Health & Safety File shall be produced in accordance with the CDM 2015 Regulations and guidance provided by the HSE. Relevant information obtained from designers, contractors and other parties during the course of the project shall be collated by the Principle Contractor for issue at the time of practical completion.

The Principle Contractor shall provide the file, and provide information expeditiously, when required, throughout the course of the project. In particular the Owners Service manuals detailed later in this specification are to be provided at latest by the date of completion, accepting that the final installation test certificates cannot be provided until after the witness tests.

The information must be specific to those Health and Safety issues relevant to the structure and shall cover the complete life cycle including development, maintenance and subsequent demolition.

Tuv Sud Ltd Dunbar Boardman Risk Assessments

(Based upon DD ISO 14798:2013)

LIFT SPECIFICATION RISK DOCUMENTATION		Document No. LSRD
Contract Name : Queens Court Newcastle		NOTE: The hazards identified should not be considered to be an exhaustive list. You are also advised to make reference to BS EN81-80:2003, for significant hazards associated with existing lift installations and implement appropriate control measures.
Lift Identity & location Passenger Lifts 1~4		
Assessment conducted by: P. S. Mantey MSc *(Lift Engineering)*	Signed: 	This document is intended as a reminder of the possible consequences of certain activities/actions and is not a reflection on your skill and experience. If you identify any other potential hazards, please ensure the master document is suitably amended.

No	Activity/Location Materials/Tools etc *(Cause/Trigger)*	Hazards Identified - *(Effect)*	S	F	Initial Risk Rating (S x F)	Persons at Risk	Control Measures/*Corrective Actions*	S	F	Final Risk Rating (S x F)	*Residual Risk*
G1	Equipment Remains Unexpectedly Live	Electric Shock due to: • Faulty switchgear • Poor insulation or earthing • Inadequate switch marking • Live interconnected wiring • Car lighting or other high voltage equipment in controller • Charge remaining on DC link capacitors on VVF drives • Equipment not PAT tested • No rubber mats • No main switch lock off facility • Missing or broken covers • Tripping hazards • Inadequate lighting	4	4	16 =VH	E CO O	Motor room to be designed to allow adequate access for working in accordance with Electricity at Work Regulations and be well lit and free of tripping hazards. Lift Contractor to ensure all staff are adequately trained in safe working practices. All portable appliances to be tested and marked with valid PAT certification. Lift Contractor to provide lock-off facilities to main switches and rubber mats to BS921 at front and rear of controllers. Wherever practical, inspection of electrical systems should be carried out only after the equipment has been isolated from the power supply. When appropriate, to safeguard accidental reconnection by others, the main supply must be "locked-off" and "tagged out" to clearly indicate that work is in progress. All readily accessible live conductors must be covered by an insulating material, e.g. rubber shrouds, or be positioned so they are safe. All equipment must be properly earthed. All doors to control cabinets must be closed and secured after use. A "treatment for electric shock" notice should be displayed in appropriate locations, as recommended by the Guidance to the Electricity at Work Regulations.	2	2	4 = L	Acceptable risk

Risk Rating Criteria					
SEVERITY (S)		FREQUENCY (F)			
1 Negligible	2 Minor Injury	1 Impossible	2 Improbable	3 Remote	
3 Serious Injury	4 Major Injury	4 Occasional	5 Probable	6 Frequent	
Risk Rating Multiples: 1 - 4 LOW = Acceptable risk; 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					

Persons at Risk	Public P	Client CL	Employee E	Contractors CO	Visitors V	Others O

No:	Activity/Location Materials/Tools etc *(Cause/Trigger)*	Hazards Identified - *(Effect)*	S	F	Initial Risk Rating (S x F)	Persons at Risk	Control Measures/*Corrective Actions*	S	F	Final Risk Rating (S x F)	*Residual Risk*
G2	Manual Handling of Equipment	Injury due to: • Items heavier than they appear • Incorrect lifting method • Lack of mechanical handling equipment • Lack of assistance for heavy load • Lack of protective footwear • Sharp edges	2	4	8 = M	E CO	All items to be marked with their weight. Lift Contractor to provide mechanical handling equipment to move items which cannot be safety man handled. Safety footwear to BS EN ISO 20345 and protective Kevlar or rigger gloves must be worn.	2	2	4 = L	Acceptable Risk
G2.1	Manual Handling of equipment at stairs / uneven heights	Injury due to: • Items heavier than they appear • Incorrect lifting method • Lack of mechanical handling equipment • Lack of assistance for heavy load • Lack of protective footwear Sharp edges	2	4	8 = M	E CO	All equipment to be reduced to the lowest weight possible . Temporary platforms to be erected to move equipment across where uneven levels exist. Lift contractor to provide mechanical handling equipment where items cannot be safely man handled. Approved PPE to be employed	3	2	6=M	Acceptable Risk
G3	Use of Percussion Drill/Angle Grinder or Hand Tools	Damage to hearing by percussion drilling or accident while using angle grinder/hand tools.	3	5	15= VH	E CO V O	Lift Contractor to observe Principal Contractors disciplines for noisy works and ensure full compliance with the Control of Noise at Work Regulations 2005. Non-percussive drills should be used wherever practical to reduce the risks from noise and vibration. Lift Contractor to ensure all staff using or working near percussion drilling equipment/angle grinders etc. are equipped with suitable ear defenders/protective goggles and that they use protective equipment and have been instructed on their correct use. All portable appliances to be tested and marked with valid PAT certification. Unless battery powered or hand tools are employed, a residual current earth leakage device (RCD) designed to BS EN 61008-1 must be used.	2	2	4 = L	Acceptable Risk

No:	Activity/Location Materials/Tools etc *(Cause/Trigger)*	Hazards Identified - *(Effect)*	S	F	Initial Risk Rating (S x F)	Persons at Risk	Control Measures/*Corrective Actions*	S	F	Final Risk Rating (S x F)	*Residual Risk*
G4	Use of Mineral Oil	Risk of illness from contact with mineral oils	3	3	9 = M	E CO	Consultant has specified gearless machines with no gear oil. Lift Contractor to provide COSHH data sheets for any substances involved. The area should be well ventilated and PPE should include the use of disposable overalls	2	2	4 = L	Acceptable Risk
G5	Use of Welding/Grinding Equipment	Danger of fire due to dry grinding or welding on site	3	4	12 = H	P CL E CO V O	Principal Contractor to establish regime of Hot Works including permits. Lift Contractor to ensure site staff are aware of procedures and work to them. Lift Contractor to provide all necessary PPE, safety and fire precautions, certified as necessary and ensure they are maintained throughout the Hot Work process. As a minimum, fire extinguishers must be readily available and members of the public and other non-essential staff excluded from the agreed work area. If gas welding equipment is used it must be inspected prior to use for damage to valves, hoses and for leaks and must not be used if defective. The work area must be well ventilated and any smoke detectors temporarily disarmed.	2	2	4 = L	Acceptable Risk

Risk Rating Criteria					
SEVERITY (S)		FREQUENCY (F)			
1 Negligible	2 Minor Injury	1 Impossible	2 Improbable	3 Remote	
3 Serious Injury	4 Major Injury	4 Occasional	5 Probable	6 Frequent	
Risk Rating Multiples: 1 - 4 LOW = Acceptable risk; 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					
Persons at Risk	Public P	Client CL	Employee E	Contractors CO	Visitors V	Others O

No:	Activity/Location Materials/Tools etc *(Cause/Trigger)*	Hazards Identified - *(Effect)*	S	F	Initial Risk Rating (S x F)	Persons at Risk	Control Measures/*Corrective Actions*	S	F	Final Risk Rating (S x F)	*Residual Risk*
G6	Use of Paint Spraying Equipment	Danger of inhalation of fumes from site spraying or painting	3	3	9 = M	CL E CO	Wherever practical, off-site application of paint specified by Consultant. Otherwise, Lift Contractor must use low fume materials where available and provide COSHH data on all materials used. Lift Contractor to provide PPE and any necessary protection and extraction necessary to comply with the COSHH Regulations.	2	2	4 = L	Acceptable Risk
G8	Delivery/Removal of Lift Equipment	Danger of tripping or being struck by equipment being removed or delivered to site.	3	4	9 = M	P CL E CO V O	Contractor to provide temporary barrier protection and notices on agreed access route for deliveries. The access route must not be accessible to the public and therefore temporary barriers erected . Any floor protection to be taped in place. All deliveries to be co-ordinated with the Engineer/Purchaser.	3	2	6 = M	Acceptable Risk
G9	Possible Asbestos Contamination Within the Lift Area	Health risk due to inhalation of asbestos fibres from: • Brake linings • Fire packing around architraves	3	4	12 = H	E CO	The owner (or 'Duty Holder') shall furnish a copy of the Asbestos Register called for by the Control of Asbestos at Work Regulations 2002. Contractor to arrange specialist analysis, identification and recommended action then submit a report to Design Team. Contractor to arrange recommended action in accordance with specialist report. Any removal & disposal shall be carried out by a registered Contractor fully in accordance with the Health & Safety at Work Act and all relevant Health & Safety Executive Guidance Notes.	3	2	6 = M	Acceptable Risk

Risk Rating Criteria					
SEVERITY (S)		FREQUENCY (F)			
1 Negligible	2 Minor Injury	1 Impossible	2 Improbable	3 Remote	
3 Serious Injury	4 Major Injury	4 Occasional	5 Probable	6 Frequent	
Risk Rating Multiples: 1 - 4 LOW = Acceptable risk; 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					
Persons at Risk	Public P	Client CL	Employee E	Contractors CO	Visitors V	Others O

No:	Activity/Location Materials/Tools etc *(Cause/Trigger)*	Hazards Identified - *(Effect)*	S	F	Initial Risk Rating (S x F)	Persons at Risk	Control Measures/*Corrective Actions*	S	F	Final Risk Rating (S x F)	*Residual Risk*

G10	Installation of Mirrors or Glass Doors/Decorative Panels	Injury from broken glass	3	3	9 = M	E CO	Design team to specify laminated glass and mirrors with safety backing. Protective gloves to be worn when handling glazed panels.	3	2	6 = M	Acceptable Risk
G11	High Voltages on Auxiliary Lift Equipment Termination Points.	Danger of electric shock	4	3	12 = H	E CO O	Lift Contractor designer to ensure all auxiliary wiring within the lift machine room, lift shafts and lift car are of a maximum 55 volts where practically possible. (PD6519-1:1995 & IEC 60479-1:1994 refer). All connections and enclosures where higher voltages are present are to be identified with appropriate signage.	3	2	6 = M	Acceptable Risk
G12	Alterations to Existing Electrical Supplies	Danger of electric shock	4	3	12 = H	E CO	Lift Contractor to issue Method Statement and Risk Assessment on working procedure on existing electrical supplies that require alteration during the scope of the works. If the existing supplies cannot be identified and isolated then works are not to proceed and must be reported to the Engineer and site contact.	2	2	4 = L	Acceptable Risk

Risk Rating Criteria					
SEVERITY (S)		FREQUENCY (F)			
1 Negligible	2 Minor Injury	1 Impossible	2 Improbable	3 Remote	
3 Serious Injury	4 Major Injury	4 Occasional	5 Probable	6 Frequent	
Risk Rating Multiples: 1 - 4 LOW = Acceptable risk; 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					
Persons at Risk	Public P	Client CL	Employee E	Contractors CO	Visitors V	Others O

No:	Activity/Location Materials/Tools etc *(Cause/Trigger)*	Hazards Identified - *(Effect)*	S	F	Initial Risk Rating (S x F)	Persons at Risk	Control Measures/*Corrective Actions*	S	F	Final Risk Rating (S x F)	*Residual Risk*
LS1	Shaft Access During Lift Installation	Danger of falling down lift shaft during construction and installation of lift.	4	3	12 = H	P CL E CO V O	Principal Contractor to protect entrance openings to lift shaft so there is no risk of falling. Lift Contractor to provide method statement with safe system of working. Lift Contractor to ensure that all staff have adequate safety equipment and are instructed for its use and that they must ensure their activities do not endanger others.	3	2	6 = M	Acceptable Risk
LS2A	Working on Car Top - Headroom Not Compliant with BSEN81	Risk of Engineer being crushed whilst working on car top.	4	5	20=VH	E CO	Lift Contractor to develop a safe system of working taking into account the existing constraints and then seek approval of his Notified Body for this deviation from the standard. As a minimum, electrically interlocked props and limit switches must prevent movement of the lift car beyond a defined point to create the safe space required by BSEN81 & BS7255. Travel in the up direction must not be attempted unless it is essential.	2	2	4 = L	Acceptable Risk
LS3	Working in the Lift Pit	Danger of Engineer being crushed below the descending car whilst working in pit.	4	4	16=VH	E CO	Pit depth and position of stop switches to be in accordance with BSEN81. Consultant to specify provision of guide clamps or props in pit. Lift Contractor to provide clamps or props along with notice instructing on their use. Prior to entering pit, verify the correct operation of the landing locks and the pit emergency stop switch. Use props on hydraulic units and do not go under a traction unit that has a load in the car.	4	2	8 = M	Pit stop switch may subsequently fail
LS5	Working on Car Top	Danger of falling from car top during maintenance or inspection	4	4	16=VH	E CO	Design Team to include in car design for safety barriers and harness anchor point. Contractor to provide suitable harness to all staff working on lift, with instructions to their use. Contractor to provide suitable notices on car top. Health & Safety file and O&M Manuals to contain information and warnings.	4	2	8 = M	Harness may not be worn
No:	Activity/Location Materials/Tools etc *(Cause/Trigger)*	Hazards Identified - *(Effect)*	S	F	Initial Risk Rating (S x F)	Persons at Risk	Control Measures/*Corrective Actions*	S	F	Final Risk Rating (S x F)	*Residual Risk*

LS6	Working on Lift Landing	Danger of falling down existing shaft from landings during works.	4	4	16=VH	E CO	Contractor to provide lockable hoarding to each entrance where the doors have been removed in accordance with the Designers specification, taking due care to avoid restricting access through building, means of escape, etc. Hoardings to be fitted with suitable notices warning of risks. Hoardings to be kept locked. Contractor to operate a "Permit to Work" system, ensuring all staff work to them and are aware of risks.	4	2	8 = M	Unauthorised persons may enter while hoardings are open
MR3	Working in Machinery Area	Danger of injury to Contractor's staff due to inadequate lifting facilities. See also item G7	4	3	12 = H	E CO	Lifting beam requirements to be shown by Lift Contractor in his design drawings. Structural Engineer to design fixings to suit. Suitable lifting beams to be provided in head of shaft by Principal Contractor. Beam to be tested and marked with its SWL. Certificates to be kept in site records.	3	2	6 = M	Acceptable Risk

Risk Rating Criteria					
SEVERITY (S)		FREQUENCY (F)			
1 Negligible	2 Minor Injury	1 Impossible	2 Improbable	3 Remote	
3 Serious Injury	4 Major Injury	4 Occasional	5 Probable	6 Frequent	
Risk Rating Multiples: 1 - 4 LOW = Acceptable risk; 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					
Persons at Risk	Public P	Client CL	Employee E	Contractors CO	Visitors V	Others O

SCHEDULE OF BUILDERS WORK

SECTION 4

4.0 SCHEDULE OF BUILDERS WORK

The work described in this section is to be provided by the Lift Contractor or his approved Building Sub-contractor and is to be included within the tender price.

4.1 Attendances

Attendances as set out in the Preliminaries including: -

Site establishment and protection

Off-loading and distribution

Storage and accommodation;

Temporary lighting and power;

Scaffold as required for the Lift Contractors preferred method of discharging the works. All scaffolding used is to be in compliance with the requirements of the Health & Safety at Work Act and any other Regulations or Statutory requirements that apply.

4.2 Dust and Debris Screens

The Lift Contractor shall provide suitable temporary screens formed of polythene sheeting such as to prevent the passage of dust and debris from the lift under construction to the lift which is in service. The screen shall be securely fixed to the building fabric and/or to the permanently installed shaft division screen, with the method of securing and the final arrangement of the screens subject to the approval of the Engineer.

The temporary screens shall be retained in place throughout the Works and until completion of the Contract, and shall be removed only upon instruction of the Engineer.

4.3 Protective Screens on Landings (Full Hoardings)

The Lift Contractor shall provide sketch drawing of his proposed landing protective screens. The drawing shall detail the design, the materials to be used, the method of construction and the manner in which the protective screen is to be secured to the building fabric.

Prior to the commencement of works on site the Lift Contractor shall provide rigid protective screens at each lift landing entrance. The screens shall be securely capped at a minimum height of 2.5 m. Each screen shall enclose such working space as is available, but shall not obstruct access and/or means of escape to routes, stairways and landings. Each screen shall incorporate a hinged and lockable access door to a clear height and width to suit the Lift Contractor's requirements.

The screens shall be constructed from smooth faced plywood or MDF board, with sufficient softwood bracing as to provide rigidity and security. Polythene sheeting which is covered with sheet(s) of hardboard over the entire area shall protect the floor area within the protective screen.

The Lift Contractor must include for meeting the additional requirements of the Building Control Officer, wherever applicable, as to the construction, and in particular the fire resistance, overall dimensions and exact positioning of protective screens, access doors and frames. Note: any protective screen on a fire escape route must be a minimum ½ hour fire rated including the doors and surround.

The access door/s shall be fitted with suited locks such that each door can be positively locked from the outside by way of a key, and can be opened from the inside without the use of a key, even when locked from the outside.

In addition, two shoot-bolts shall be fitted on the inside of each such door. All doors shall be fitted with self-closers in order to prevent these being inadvertently opened.

All fixings shall be such that these cannot be removed from the outside of the screen and shall not cause any damage to the decorative finishes. The Lift Contractor shall maintain the screens and doors in a safe condition throughout the duration of the Works and shall not remove these until directed to do so by the Engineer.

Within each hoarding a handrail, mid-rail and toe board shall be provided in order to protect any open void. These may be removed temporarily for working only when the lift car is safely positioned at that landing and on the basis that these are re-instated before the lift car is moved.

The screens shall be decorated to complement the surrounding décor, with a minimum of two coats of emulsion paint, in a colour to be agreed.

The Lift Contractor shall maintain the finish of the screens throughout the works and to the satisfaction of the Engineer and shall ensure that any dirty marks are removed from the landing side of the screen as and when these arise.

Danger notices warning of the nature of works and any exposed voids, complete with 'apology for inconvenience' signage, shall be prominently displayed on the screens.

4.4 Dismantling

The Lift Contractor is to allow for dismantling of all redundant lift and associated equipment and the expeditious removal of the same from site.

On completion of the dismantling element of the works, he is to include for preparation of, and any alteration to, the building fabric which is required to accommodate the new lift equipment.

The material shall be disposed of in a responsible manner, taking due regard of all relevant Regulations and the Lift Contractor shall include for the payment of all relevant Taxes or charges associated with this within his Tender.

4.5 Decommissioning and Removal of Lifts

All decommissioning and removal of existing redundant lift equipment is to be included. Materials of any kind obtained from dismantling, shall become the property of the Lift Contractor after offering the client access for salvageable spares. Such material shall be disposed of in a responsible manner, taking due regard of all relevant Regulations, but in any case, shall be removed from the premises promptly, as soon as dismantled and at all times expeditiously and cleanly. The Contractor shall include for all taxes or other statutory fees associated with the disposal of the materials.

Prior to commencement of the works the Lift Consultant shall identify any items of equipment that is to be carefully removed and delivered into an agreed location within the premises for possible re-use on other installations.

As part of the works the Contractor shall ensure that personnel have received the correct safety induction and have available the necessary tools, plant, plus their required test certificates, all personal protection to complete the works.

Where removals involve the use of Hot Work Permits, these shall be obtained in accordance with the Purchaser's requirements.

During manual handling, all dismantled materials shall be broken down into adequate, manageable sections ready for disposal, using mechanical methods wherever possible and subject to the Engineers approval.

The following is a guide method of works that would be subject to an approved statement from the recommended Contractor.

Hang the lift car by means of a suitable chain block to the lift car by wire rope slings, connected to a “safe working load” marked steel bar suspended from the lift equipment steels. The safety gear and governor rope will be left in situ and in working order whilst the lowering operation is in progress (as a back-up safety device).

Car suspension ropes to be disconnected from the car and counterweight. Ropes are to be pulled up to the top floor through the shaft, coiled up, tied and removed from the area via an agreed location.

The Contractor when descending down the shaft, shall remove all brackets and guides and by means of unbolting. The guides to be lowered using a suitable gist hoisting suspended from the top of the shaft by means of wire rope slings and hanging steels. Alternatively they will be cut into manageable sections and carried down stairs via the nearest exit, subject to Engineers approval.

Each landing entrance, including headers, upright angles, doors and landing angle sills shall be removed by means of unbolting, angle grinders and reciprocal saws cutting equipment.

Upon completion of the above the car will then be at the lowest terminal where it is to be dismantled using hand tools..

No Oxy-propane cutting equipment to be used on this site.

All fire precautions to be taken.

The counterweight shall be removed from the shaft by hand with team lifting or by suitable electric Gist hoist. All equipment and redundant materials will then be removed from the lift shaft area via an agreed route approved by the Engineer.

The motor room equipment will be broken down into small, manageable sections i.e. motor and gear units, plus controllers by unbolting and/or grinding. All fire precautions to be taken.

The Lift Contractor shall apply safety measures in accordance with the requirements of BS7255, BS6187, HSE Guidance FOD 1-2013 and LEIA Guidance Demolition and Dismantling of Lifts PA54.

4.6 Lifting Beams

All existing lifting beams shall be tested and marked with their safe working load before use.

Prior to commencement of the Works, the Lift Contractor shall supply and install within the lift shaft/machinery area lifting beams. These shall be purpose designed such as to accommodate the weight of the lift car, counterweight or complete lift machine assembly.

The beams shall be designed in accordance with the requirements of the equipment to be lifted and those of BS EN1993-6. The installed beams shall be tested in accordance with the requirements of BS2853: 2011.

Prior to use the installed beams shall be tested and a label affixed indicating the safe working load in compliance with the requirements of PUWER, LOLER and the Health & Safety at Work Act 1974.

Upon completion they shall be painted bright yellow and stencilled with their reference number and the tested safe working load in kilograms. All test certificates shall be provided in the CDM file.

4.7 Lift Entrances

The existing landing entrances shall be increased to 800 mm wide clear openings and fitted with full wrap around architraves as detailed in section 7 of this specification.

Where necessary to accommodate the specified car depth the landing sill nosing's shall be cut back and made good .

The making good of the landing entrance walls and fitting matching trims to the perimeter of the full front is to be included by the Lift Contractor.

4.8 Scaffolding

The Work at Height Regulations 2005 requires an assessment to be undertaken before starting any work at height. If the assessment confirms that there is no alternative to working at height, then suitable work equipment should be selected, taking into account the nature of the work.

The type of scaffold tower selected must be suitable for the work and erected and dismantled by people who have been trained and are competent to do so.

Those using tower scaffolds should also be trained in the potential dangers and precautions required during use.

Tower scaffold provision and use must be properly managed and include rigorous scaffold inspection arrangements.

Tower scaffolds must comply with the standards required for all types of scaffolds, e.g. double guardrails, toe boards, bracing and access ladder.

All towers must be inspected following assembly and then at suitable regular intervals by a competent person. In addition, if the tower is used for construction work and a person could fall 2 metres or more from the working platform, then it must be inspected following assembly and then every 7 days.

The result of an inspection should be recorded in the site Safety File and a copy kept for at least three months by the principle contractor.

The use of a visible tag system, which is updated each time a check is carried out, to supplement inspection records is required.

4.9 Wall Fixings

All fixings shall be drill fixed into the block/brickwork and NOT the bond .

The fixings shall be a propriety fixing as approved by the manufacturer for the specified loads and subject to a pull out tests on a least three areas of concrete block/brickwork. The results of the pull out tests shall be included in the CDM File upon Completion.

4.10 Pit Ladder (fixed)

In cases in which the depth of the lift well pit does not exceed 2.5 M and/or in cases in which a separate pit access door is not provided, the Lift Contractor shall supply and install a fixed access ladder in the lift pit(s).

The access ladder shall be easily accessible from the landing entrance door and shall be permanently and securely fixed to the building fabric.

The design and construction of the access ladder shall be such as to withstand the weight of one person based upon a minimum force of 1500 N.

The access ladder shall be designed in accordance with the requirements of BS EN81-20: 2014 and BS EN131-2: 2010+A1:2012 and shall be constructed in steel with a suitable anti-corrosion finish.

The ladder shall be constructed from steel uprights, which provide for safe and easy hand grasping, and which extend vertically from the base of the pit floor to a minimum of 1.1 M above the landing sill of the pit access landing entrance. The uprights shall be of width not exceeding 35 mm and depth not exceeding 100 mm.

The ladder shall incorporate flat steel treads which shall be of minimum clear width 280 mm, with a flat tread of minimum 25 mm and maximum 35 mm in depth, and which shall be spaced equally at vertical intervals of not less than 250 mm and not exceeding 300 mm. The upward surface of each tread shall be non-slip by way of permanent surface finish.

The access ladder shall be designed and installed such that a minimum clear distance of 200 mm is attained between the rear of each tread and the wall of the pit or any other element of the building fabric or equipment.

4.11 Pit Ladder - Alternative Design

Should it be impossible to safely accommodate a fixed ladder within the lift pit, the Lift Contractor shall provide a suitable alternative access ladder the design and construction of which shall be in accordance with the requirements of the designs designated Type 1, Type 2a, Type 2b, Type 3a, Type 3b or Type 4, set out at Annexe F of BS EN81-20: 2014, and to the approval of the Engineer.

The Lift Contractor shall state at Section 10 of this Specification in the Technical Details of the Tender Return which of the ladder Type Designs he has included for in his Tender.

The ladder shall be permanently housed and stored in the lift well pit such that this cannot be removed from the lift well and/or used for other purposes.

The distance between the edge of the landing entrance and the ladder in its stored position shall not exceed 800 mm.

The distance between the edge of the landing entrance and the centre of the ladder treads when the ladder is in the deployed position shall not exceed 600 mm.

When in the deployed position the first tread of the ladder shall be as close as possible to the level of the landing sill.

If, when in the deployed position, the ladder is within the travel path of the lift car, or whenever there is a risk that the ladder may come into contact with moving machinery, then the ladder, and/or its storage bracket/mounting, shall be equipped with

an electrical safety device which prevents operation of the lift whilst the ladder is in the deployed position and when the ladder is not in the stored position.

In each design case the ladder, when in use, shall be such that this is secured to the landing sill and/or, the base of the pit and/or, the wall of the lift well, such as to ensure safe access and to prevent tipping-over of the ladder.

In the case of retractable and/or folding ladder designs these shall be such as to prevent the shearing or crushing of hands or feet during use and during deployment and during storage following use.

In the case of moveable and/or foldable access ladders these shall be designed and constructed such that the weight of this does not exceed 15 kg and such that handling and storage may be safely undertaken at the landing sill and lift well pit.

In the case that the ladder is stored upon the pit floor the ladder shall not, when in its stored position, encroach upon the pit refuge spaces.

4.12 Emergency and Intervention Panel

The emergency and Intervention [E&I] Panel shall be recessed into the wall at the top floor so as not to restrict the lobby.

The E&I panel shall be protected with a robust stainless steel door panel fitted with top and bottom locks of a restricted pattern key (not Euro Locks) to a vandal resistant standard as EN 81-71 Category 1.

The lift contractor shall include for all builders works and making good associated with recessing the panel.

4.13 Making Good

The Lift Contractor shall make good all damage to the fabric or finishes in the building and its surroundings, whether scheduled or inadvertent that has been occasioned by his Works and these shall be in matching material to the existing. In the event that matching material proves difficult to obtain, alternatives shall be offered for consideration prior to the making good being put in hand.

Particular care is to be taken with the decorative finishes to floors and walls around the lift entrances.

The landing thresholds shall be made good in a contrasting floor covering material , to the approval of the client, which shall be a semi-circle of 1m radius from the centre of the doors.

The extent of making good shall be defined for estimating purposes as the full front wall of the lift shaft from floor to ceiling for the full width of the lift well the nearest natural break line. This may be varied prior to commencement by mutual agreement between the Lift Contractor and Engineer.

4.14 Machine Rooms

The existing machine room shall be stripped of all lift redundant lift equipment.

Unused holes in the machine room walls shall be made good with keyed mortar and plaster.

4.15 Shaft Painting

The Lift Contractor shall clean down the lift well and pit, remove all debris and treat the shaft wall with two coats of white emulsion paint.

At the completion of the works, these finishes shall be repaired to the satisfaction of the Engineer.

4.16 Pit Floor

The floor of the pit shall be degreased , and painted with two coats of a non slip, oil impervious floor paint of a light grey colour.

4.17 Landing Fixture Apertures

The replacement pushes and indicators shall be a surface mounted type mounted on the full fronts .

4.18 Architraves

Rectangular section jamb wrap around architraves shall be fitted at each entrance. They shall be finished as per the schedules of finishes in this specification.

The architraves shall be formed around 14 SWG steel formers which shall be packed true and square to the structural opening and secured to the entrance wall with concealed fixings.

The architraves steel former shall be skinned in patterned stainless steel as per the schedule of finishes.

The design of the architrave shall be a rectangular header section which sits over the two jambs providing a single joint to the top each architrave leg.

The architraves shall extend from the line of clear opening and project to not more than 20 mm from the face of the landing entrance finishes.

All architraves shall be site measured after the installation of the landing entrances.

4.19 Smoke Vent

Smoke vents in lift wells are no longer necessary under the Lift Regulations or local planning requirements.

The Lift Contractor shall confirm that the heat output from the proposed equipment and the amount of well ventilation from around door clearances shall provide adequate ventilation to maintain the equipment within stable operating temperatures.

On the basis of the above confirmation the lift contractor shall build up the existing smoke vent.

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SCHEDULE OF ELECTRICAL WORK

SECTION 5

5.0 SCHEDULE OF ELECTRICAL WORK

The works described below are to be provided by the Lift Contractor's approved Electrical sub-contractor and are to be included in the tender price. All works are to be carried out and completed in full compliance with the current edition of BS7671 the IEE Regulations and the Electricity at Work Act.

5.1 Mains Supply

The Lift Contractor shall re terminate the existing supply cable in a lock off fused switch and take a SWA cable from this fused switch to a commando socket with isolator, within the top of the well or top floor E&I panel.

The cables shall be sized in accordance with BS7671(17th Edition) Wiring Regulations.

5.2 Mains Fuses

The Lift Contractor shall provide fuses within the fused switch to suit the electrical loading of the equipment provided.

5.3 Auxiliary Supplies

The Lift Contractor shall provide for all auxiliary supplies to be provided via intervention panel save as for the lift well lighting and pit socket outlet which shall be provided from the existing machine room DB.

5.4 Shaft Lighting

The Lift Contractor shall provide permanent lighting throughout the travel of the lifts. All associated wiring is to be run in separate metal conduit to the lift wiring and the fittings used are to be industrial type, twin fluorescent bulkhead with IP 65 polycarbonate diffusers to approval.

Two way switching is to be provided so the lights can be controlled from both the E&I panel and the lift pit access. The switch in the lift shaft shall be located 1.3m above the bottom terminal floor landing sill and shall be capable of being operated from the landing. Fittings are to be mounted at adequate pitch in-between, to ensure that the minimum light levels specified in BS EN81-20 are achieved at any point in the shaft.

The top, bottom and each intermediate well light shall be a non maintained emergency luminaire with a self-contained rechargeable power supply and neon indicator.

5.5 Pit Socket Outlets

Within the lift pit provide double, switched 13 amp three pin socket outlets, with integral RCD designed to operate at 30mA.

This shall derive its supply from the machine room single phase DB supply.

5.6 Redundant Electrical Containment

All redundant electrical containment both within the lift well and within the machine room shall be removed by the lift contractor.

5.7 Rerouting Services Passing Through Lift Well

The lift contractors electrical sub contractor shall re-route the existing SWA cable and fire alarm cable that pass through the lift well to the adjacent boiler room or apply for Notified Body Approval of placing a cover over the cable with labelling of no serviceable parts and providing a statement in the Health and Safety File on the basis of a new lift in an existing building.

5.8 Testing of Electrical Installations

All electrical installation circuits shall be tested by an NICIEC Approved Electrical Contractor to demonstrate compliance with BS7671(17th Edition) Wiring Regulations and test certificates provided in the CDM manual for the lift.

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SCHEDULE OF EQUIPMENT

SECTION 6

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6.0 SCHEDULE OF EQUIPMENT

6.1 SUMMARY OF EXISTING EQUIPMENT

Type of Lift	Single speed electric traction lift.
Number of Lifts	Four
Manufacturer/Installer	The Express Lift Company.
Identity Numbers	Lifts 1, 2, 3 and 4
Date of Installation	Existing lifts are a modernisation package of the original existing lift. The Express lift company installed this in 1982.
Date of Modernisation (if any)	1982
Well Construction	Shaft Walls - Brick (Untreated) Shuttered concrete base to landing entrances.
Machine Room Location	Above.
Load Capacity	8 person / 630kg
Car Dimensions	1210mm wide x 1260mm deep x 2180mm high
Operating Speed	0.5 m/s
Levels Served	Lifts 1, 3 and 4 serve G, 2, 4. (3 floors skip stop). Lift 2 serves G, 2, 4, 6. (4 floors skip stop).
Landing Door Type	1 panel side opening. (770W x 2000H)
Car Door Type	1 panel side opening. Lifts 1,3 and 4- Express Medium duty operator. Lift 2- Otis Do2000 operator.
Door Openings	770mm wide x 2000mm high
Control System	Single speed relay control system, The Express lift company.
Drive System	Express geared “B” machine, Zeill abegg motor, 1:1 roping.
Roping / Mounting Arrangement	1:1 roping. 3 ropes.
Car and Counterweight Buffers	Car – Metal Spring. x1 Counterweight – Metal Spring x1
Over-speed Governor	Express Lifts.

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6.2 SUMMARY OF LIFT REPLACEMENT (LIFT 1)

The minimum of the following works shall be undertaken to provide a replacement lift which complies with EN 81-20 and 50 and complies with EN 81- 70 ; EN 81-71 Category 1 ; EN 81/73 .

Number and Type of Lift	One – Machine Roomless Traction Passenger / Goods Lift
Capacity	MINIMUM 7 persons 550 kg
Speed	1.0 m/s
No. of Stops	3
Levels Served	G, 2, 4 ,
Floor Nomenclature	G, 2,4 ,
Travel	10,360 mm (as existing to be checked on site)
Well Dimensions (as existing to be checked on site)	1890 mm wide x 1760 mm deep (less 140 sill nib)
Headroom	4089 mm
Pit Depth	990 mm
Machine Position	Within top of well
Drive Systems	Gearless AC hauling machine mounted within the top of the lift well comprising of permanent magnet synchronous motor mounted on a common shaft with sheave to provide variable speed control from a Variable Voltage Variable Frequency regulated none regenerative drive.
Duty Cycle	180 starts per hour
Levelling Accuracy	+/ - 5 mm
Power Supply	Existing re terminated

Car Dimensions	1100 wide x 1300 deep x 2200 high
Number of Car entrances	One
Car Entrances	800 mm wide x 2000 mm high two panel side opening
Car Door Operators	Variable Voltage Variable Frequency linear belt drive to provide torque control over full entrance width.
Car Door Protection	2 D Infra Red Full Height Safety Edge
Landing Entrances	800 mm wide x 2000 mm high two panel side opening
Landing Entrance Surrounds	Full Wrap Around Architraves as detailed in this specification.
Door Sills	Extruded aluminium alloy . .
Mounting Arrangement	Mounted on landing nib
Landing Entrance Fire Rating	2 hours with a UK fire Certificate.
Control Systems	Simplex Down Collective
Control Features	• EN 81- Part 70 compliant • Goods control key • Manual Fire Alarm recall to main exit by Fireman's Switch
Signal & Operating Fixtures	Vandal Resistant to EN 81-70 / 71 & 73

Car Control Stations	One car control station shall be provided which shall be mounted in the car slam post side wall in the front quarter of the lift car. All fixtures will be heavy duty vandal resistant. The COP shall comprise of a full height hinged panel released from above the car and shall contain the following :- 1. CE mark & Notified Body No 2. Load Plate 3. Lift Contractors Lift Serial Number 4. Client Lift Number (Lift 1) 5. Digital Full Position Indicator to show :--,dual digit Alpha numerics OVERLOADED and direction of travel arrows. 6. Information for operation of hands free auto dialler and induction loop logo 7. Perforated grid for hands free auto dialler. Yellow illuminating indicator in form of an alarm bell to indicate alarm signal has been sent. EN 81-70 8. Green Illuminating indicator in form of a telephone handset to confirm communication connection. EN 81 -70 9. Independent/Auto goods service key switch. 10. One push button for each floor served, with adjacent tactile notation as per the indicator notation. Level G push to protrude 5 mm beyond other pushes. 11. Door OPEN Push button 12. Door Extended Open push button, 13. Door CLOSE push button 14. Alarm push coloured yellow complete with bell logo which shall illuminate under emergency lighting conditions. All pushes shall be mounted at a height of between 900 mm & 1200 mm.
Car Indicators	Min 60mm high characters, contrasting LED illuminated LCD, digital full position indicator, to give dual digit notation protected by a vandal resistant and scratch resistant lens.
Landing Indicators (all floors)	Min 60mm high characters , Contrasting LED illuminated LCD, digital full position indicator, to give numeric notation and next direction of travel arrows and pre arrival annunciation electronic chimes. Incorporating energy saving sleep feature. Mounted vertically above the landing pushes.
Landing Pushes	Heavy Duty Vandal Resistant pushes at all floors with LED call accept illumination and LED illuminated tactile notation and audible feedback
Landing Tactile signage	Cast aluminium architrave jamb plates and tactile notation to be mounted on the architrave jambs.
Control Panel	Control panel located in accessible located from top floor landing or mounted in a maintainable position from the car top with Auxiliary Emergency controls accessible from the landing. Control features to include :- Car light and fan switch off timer

	Indicator reduced illumination mode Drive economy mode Indicator switch off modes Peripheral switch off mode Independent Service Key switch Lift isolation key switch .
Landing Accessible Controls	To include :- Manual movement switch. Electrical recovery push button controls. Fault diagnostic switch. Main and auxiliary supply circuit breakers.
Guide Rails Car	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m lengths) 16 mm blade
Guide Rails Counterweight	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m Lengths) min 10 mm blade
Guide Shoes	Min 200 mm long Sliding type with removable liners
Car Safety Gear	Type Tested Progressive type.
Car Safety Gear Operation	Over speed Governor mounted within the top of the well with remote test facility.
Upward over speed device	100% redundancy of brake
Prevention of movement with doors open	CE certified system to EN 81-20 .
Car Top Refuge	The car top refuge in accordance with EN 81-20 shall accommodate space for one man.
Buffers	Energy Accumulation type.
Emergency Lighting	To be supplied from UPS unit having adequate capacity to provide power to all of the car lights supply the alarm push LED's; supply the hand winding audible signal ; the car top emergency light ; alarm signal and fan for 3 hours.

Emergency Communications System	Hands free Auto Dial system. To be a MEMCOM + system with the car unit installed behind perforations in the COP and two further units , a car top and engineers unit in the lift pit accessible from the refuge space.
Emergency Recovery (ARU / EBD)	The lift shall be provided with an Automatic Emergency Battery Recovery Drive to drive the lift car to floor level and open the doors in the event of a power failure.
Alarm System	The alarm system shall comprise : Yellow alarm push on car control station complete with bell logo Approved sounder mounted above main landing entrance of a different tone to the fire alarm system. To be supplied from a separate power pack. The sounder to provide an output of not less than 95 dBA.
Car Ventilation	Concealed low level grilles fitted with external baffle plates and insect grilles and quiet ceiling mounted extract fans which shall operate on a run timer. Fans shall not be key switch operated and shall not run continuously. Fan to have emergency power back up, refer to car finishes section.
Maintenance Controls	A car top maintenance control unit shall be fitted on the car top in accordance with EN 81-20 shall be complete with car top light and emergency light. The unit shall be mounted vertically and secured in a position with the pushes visible from the landing. A similar unit shall be provided in the lift pit accessible from the pit refuge space.
Engineers Emergency Communications System.	Shall be a MEMCOM Unit .
Other Items to be Included by Lift Maker	(a) All wall drill fixings for shaft walls by the Lift Contractor to fix guide rails and door frames.
	(b) Pull out tests at three points for all drill fixings
	(c) Lifting beams in well
	(d) All fixings for all brackets and steelwork for machine support.
	(e) Primed and painted sheet metal fascia panels and car toe guard.
	(f) LSF Shaft wiring protected by LSF trunking and conduit.
	(g) Pit ladder to EN 81-20 .
	(h) Hand Winding floor level audible and visual signal and instructions.
	(i) Site painting of finished lift installation as required.
	(j) Testing of lift in accordance with EN 81-20 and BS8486.
	(k) Repeat testing of the lift in the presence of the Engineer

	(l) Plastic encapsulated wiring diagrams in control panel
	(m) Comprehensive Maintenance Manuals, Lift Register, Log Cards and Record Drawings ,CDM file ,in accordance with the specified requirements
	(n) 12 months maintenance during the extended guarantee period. Refer to section 9
	(o) Before the end of the Defects Liability Period the lift maintainer shall under take all annual inspections as listed under SAFED LG1 documentation. All certificates shall be issued to the engineer.

6.3 SUMMARY OF LIFT REPLACEMENT (LIFT 2)

The minimum of the following works shall be undertaken to provide a replacement lift which complies with EN 81-20 and 50 and complies with EN 81- 70 ; EN 81-71 Category 1 ; EN 81/73 .

Number and Type of Lift	One – Machine Roomless Traction Passenger / Goods Lift
Capacity	MINIMUM 7 persons 550 kg
Speed	1.0 m/s
No. of Stops	4
Levels Served	G, 2, 4 , 6
Floor Nomenclature	G, 2,4 ,
Travel	15,540 mm (as existing to be checked on site)
Well Dimensions (as existing to be checked on site)	1890 mm wide x 1750 mm deep (less 140 sill nib)
Headroom	4089 mm
Pit Depth	990 mm
Machine Position	Within top of well
Drive Systems	Gearless AC hauling machine mounted within the top of the lift well comprising of permanent magnet synchronous motor mounted on a common shaft with sheave to provide variable speed control from a Variable Voltage Variable Frequency regulated none regenerative drive.
Duty Cycle	180 starts per hour
Levelling Accuracy	+/ - 5 mm
Power Supply	Existing re terminated

Car Dimensions	1100 wide x 1300 deep x 2200 high
Number of Car entrances	One
Car Entrances	800 mm wide x 2000 mm high two panel side opening
Car Door Operators	Variable Voltage Variable Frequency linear belt drive to provide torque control over full entrance width.
Car Door Protection	2 D Infra Red Full Height Safety Edge
Landing Entrances	800 mm wide x 2000 mm high two panel side opening
Landing Entrance Surrounds	Full Wrap Around Architraves as detailed in this specification.
Door Sills	Extruded aluminium alloy . .
Mounting Arrangement	Mounted on landing nib
Landing Entrance Fire Rating	2 hours with a UK fire Certificate.
Control Systems	Simplex Down Collective
Control Features	• EN 81- Part 70 compliant • Goods control key • Manual Fire Alarm recall to main exit by Fireman's Switch
Signal & Operating Fixtures	Vandal Resistant to EN 81-70 / 71 & 73

Car Control Stations	One car control station shall be provided which shall be mounted in the car slam post side wall in the front quarter of the lift car. All fixtures will be heavy duty vandal resistant. The COP shall comprise of a full height hinged panel released from above the car and shall contain the following :- 1. CE mark & Notified Body No 2. Load Plate 3. Lift Contractors Lift Serial Number 4. Client Lift Number (Lift 2) 5. Digital Full Position Indicator to show :--,dual digit Alpha numerics OVERLOADED and direction of travel arrows. 6. Information for operation of hands free auto dialler and induction loop logo 7. Perforated grid for hands free auto dialler. Yellow illuminating indicator in form of an alarm bell to indicate alarm signal has been sent. EN 81-70 8. Green Illuminating indicator in form of a telephone handset to confirm communication connection. EN 81 -70 9. Independent/Auto goods service key switch. 10. One push button for each floor served, with adjacent tactile notation as per the indicator notation. Level G push to protrude 5 mm beyond other pushes. 11. Door OPEN Push button 12. Door Extended Open push button, 13. Door CLOSE push button 14. Alarm push coloured yellow complete with bell logo which shall illuminate under emergency lighting conditions. All pushes shall be mounted at a height of between 900 mm & 1200 mm.
Car Indicators	Min 60mm high characters, contrasting LED illuminated LCD, digital full position indicator, to give dual digit notation protected by a vandal resistant and scratch resistant lens.
Landing Indicators (all floors)	Min 60mm high characters , Contrasting LED illuminated LCD, digital full position indicator, to give numeric notation and next direction of travel arrows and pre arrival annunciation electronic chimes. Incorporating energy saving sleep feature. Mounted vertically above the landing pushes.
Landing Pushes	Heavy Duty Vandal Resistant pushes at all floors with LED call accept illumination and LED illuminated tactile notation and audible feedback
Landing Tactile signage	Cast aluminium architrave jamb plates and tactile notation to be mounted on the architrave jambs.
Control Panel	Control panel located in accessible located from top floor landing or mounted in a maintainable position from the car top with Auxiliary Emergency controls accessible from the landing. Control features to include :- Car light and fan switch off timer Indicator reduced illumination mode

	Drive economy mode Indicator switch off modes Peripheral switch off mode Independent Service Key switch Lift isolation key switch .
Landing Accessible Controls	To include :- Manual movement switch. Electrical recovery push button controls. Fault diagnostic switch. Main and auxiliary supply circuit breakers.
Guide Rails Car	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m lengths) 16 mm blade
Guide Rails Counterweight	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m Lengths) min 10 mm blade
Guide Shoes	Min 200 mm long Sliding type with removable liners
Car Safety Gear	Type Tested Progressive type.
Car Safety Gear Operation	Over speed Governor mounted within the top of the well with remote test facility.
Upward over speed device	100% redundancy of brake
Prevention of movement with doors open	CE certified system to EN 81-20 .
Car Top Refuge	The car top refuge in accordance with EN 81-20 shall accommodate space for one man
Buffers	Energy Accumulation type.
Emergency Lighting	To be supplied from UPS unit having adequate capacity to provide power to all of the car lights supply the alarm push LED's; supply the hand winding audible signal ; the car top emergency light ; alarm signal and fan for 3 hours.

Emergency Communications System	Hands free Auto Dial system. To be a MEMCOM + system with the car unit installed behind perforations in the COP and two further units , a car top and engineers unit in the lift pit accessible from the refuge space.
Emergency Recovery (ARU / EBD)	The lift shall be provided with an Automatic Emergency Battery Recovery Drive to drive the lift car to floor level and open the doors in the event of a power failure.
Alarm System	The alarm system shall comprise : Yellow alarm push on car control station complete with bell logo Approved sounder mounted above main landing entrance of a different tone to the fire alarm system. To be supplied from a separate power pack. The sounder to provide an output of not less than 95 dBA.
Car Ventilation	Concealed low level grilles fitted with external baffle plates and insect grilles and quiet ceiling mounted extract fans which shall operate on a run timer. Fans shall not be key switch operated and shall not run continuously. Fan to have emergency power back up, refer to car finishes section.
Maintenance Controls	A car top maintenance control unit shall be fitted on the car top in accordance with EN 81-20 shall be complete with car top light and emergency light. The unit shall be mounted vertically and secured in a position with the pushes visible from the landing. A similar unit shall be provided in the lift pit accessible from the pit refuge space.
Engineers Emergency Communications System.	Shall be a MEMCOM Unit .
Other Items to be Included by Lift Maker	(a) All wall drill fixings for shaft walls by the Lift Contractor to fix guide rails and door frames.
	(b) Pull out tests at three points for all drill fixings
	(c) Lifting beams in well
	(d) All fixings for all brackets and steelwork for machine support.
	(e) Primed and painted sheet metal fascia panels and car toe guard.
	(f) LSF Shaft wiring protected by LSF trunking and conduit.
	(g) Pit ladder to EN 81-20 .
	(h) Hand Winding floor level audible and visual signal and instructions.
	(i) Site painting of finished lift installation as required.
	(j) Testing of lift in accordance with EN 81-20 and BS8486.
	(k) Repeat testing of the lift in the presence of the Engineer

	(l) Plastic encapsulated wiring diagrams in control panel
	(m) Comprehensive Maintenance Manuals, Lift Register, Log Cards and Record Drawings ,CDM file ,in accordance with the specified requirements
	(n) 12 months maintenance during the extended guarantee period. Refer to section 9
	(o) Before the end of the Defects Liability Period the lift maintainer shall under take all annual inspections as listed under SAFED LG1 documentation. All certificates shall be issued to the engineer.

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6.4 SUMMARY OF LIFT REPLACEMENT (LIFT 3)

The minimum of the following works shall be undertaken to provide a replacement lift which complies with EN 81-20 and 50 and complies with EN 81- 70 ; EN 81-71 Category 1 ; EN 81/73 .

Number and Type of Lift	One – Machine Roomless Traction Passenger / Goods Lift
Capacity	MINIMUM 7 persons 550 kg
Speed	1.0 m/s
No. of Stops	3
Levels Served	G, 2, 4 ,
Floor Nomenclature	G, 2,4 ,
Travel	10,360 mm (as existing to be checked on site)
Well Dimensions (as existing to be checked on site)	1880 mm wide x 1750 mm deep (less 140 sill nib)
Headroom	4089 mm
Pit Depth	990 mm
Machine Position	Within top of well
Drive Systems	Gearless AC hauling machine mounted within the top of the lift well comprising of permanent magnet synchronous motor mounted on a common shaft with sheave to provide variable speed control from a Variable Voltage Variable Frequency regulated none regenerative drive.
Duty Cycle	180 starts per hour
Levelling Accuracy	+/ - 5 mm
Power Supply	Existing re terminated

Car Dimensions	1100 wide x 1300 deep x 2200 high
Number of Car entrances	One
Car Entrances	800 mm wide x 2000 mm high two panel side opening
Car Door Operators	Variable Voltage Variable Frequency linear belt drive to provide torque control over full entrance width.
Car Door Protection	2 D Infra Red Full Height Safety Edge
Landing Entrances	800 mm wide x 2000 mm high two panel side opening
Landing Entrance Surrounds	Full Wrap Around Architraves as detailed in this specification.
Door Sills	Extruded aluminium alloy . .
Mounting Arrangement	Mounted on landing nib
Landing Entrance Fire Rating	2 hours with a UK fire Certificate.
Control Systems	Simplex Down Collective
Control Features	• EN 81- Part 70 compliant • Goods control key • Manual Fire Alarm recall to main exit by Fireman's Switch
Signal & Operating Fixtures	Vandal Resistant to EN 81-70 / 71 & 73

Car Control Stations	One car control station shall be provided which shall be mounted in the car slam post side wall in the front quarter of the lift car. All fixtures will be heavy duty vandal resistant. The COP shall comprise of a full height hinged panel released from above the car and shall contain the following :- 1. CE mark & Notified Body No 2. Load Plate 3. Lift Contractors Lift Serial Number 4. Client Lift Number (Lift 3) 5. Digital Full Position Indicator to show :--,dual digit Alpha numerics OVERLOADED and direction of travel arrows. 6. Information for operation of hands free auto dialler and induction loop logo 7. Perforated grid for hands free auto dialler. Yellow illuminating indicator in form of an alarm bell to indicate alarm signal has been sent. EN 81-70 8. Green Illuminating indicator in form of a telephone handset to confirm communication connection. EN 81 -70 9. Independent/Auto goods service key switch. 10. One push button for each floor served, with adjacent tactile notation as per the indicator notation. Level G push to protrude 5 mm beyond other pushes. 11. Door OPEN Push button 12. Door Extended Open push button, 13. Door CLOSE push button 14. Alarm push coloured yellow complete with bell logo which shall illuminate under emergency lighting conditions. All pushes shall be mounted at a height of between 900 mm & 1200 mm.
Car Indicators	Min 60mm high characters, contrasting LED illuminated LCD, digital full position indicator, to give dual digit notation protected by a vandal resistant and scratch resistant lens.
Landing Indicators (all floors)	Min 60mm high characters , Contrasting LED illuminated LCD, digital full position indicator, to give numeric notation and next direction of travel arrows and pre arrival annunciation electronic chimes. Incorporating energy saving sleep feature. Mounted vertically above the landing pushes.
Landing Pushes	Heavy Duty Vandal Resistant pushes at all floors with LED call accept illumination and LED illuminated tactile notation and audible feedback
Landing Tactile signage	Cast aluminium architrave jamb plates and tactile notation to be mounted on the architrave jambs.
Control Panel	Control panel located in accessible located from top floor landing or mounted in a maintainable position from the car top with Auxiliary Emergency controls accessible from the landing. Control features to include :- Car light and fan switch off timer Indicator reduced illumination mode

	Drive economy mode Indicator switch off modes Peripheral switch off mode Independent Service Key switch Lift isolation key switch .
Landing Accessible Controls	To include :- Manual movement switch. Electrical recovery push button controls. Fault diagnostic switch. Main and auxiliary supply circuit breakers.
Guide Rails Car	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m lengths) 16 mm blade
Guide Rails Counterweight	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m Lengths) min 10 mm blade
Guide Shoes	Min 200 mm long Sliding type with removable liners
Car Safety Gear	Type Tested Progressive type.
Car Safety Gear Operation	Over speed Governor mounted within the top of the well with remote test facility.
Upward over speed device	100% redundancy of brake
Prevention of movement with doors open	CE certified system to EN 81-20 .
Car Top Refuge	The car top refuge in accordance with EN 81-20 shall accommodate space for one man.
Buffers	Energy Accumulation type.
Emergency Lighting	To be supplied from UPS unit having adequate capacity to provide power to all of the car lights supply the alarm push LED's; supply the hand winding audible signal ; the car top emergency light ; alarm signal and fan for 3 hours.

Emergency Communications System	Hands free Auto Dial system. To be a MEMCOM + system with the car unit installed behind perforations in the COP and two further units , a car top and engineers unit in the lift pit accessible from the refuge space.
Emergency Recovery (ARU / EBD)	The lift shall be provided with an Automatic Emergency Battery Recovery Drive to drive the lift car to floor level and open the doors in the event of a power failure.
Alarm System	The alarm system shall comprise : Yellow alarm push on car control station complete with bell logo Approved sounder mounted above main landing entrance of a different tone to the fire alarm system. To be supplied from a separate power pack. The sounder to provide an output of not less than 95 dBA.
Car Ventilation	Concealed low level grilles fitted with external baffle plates and insect grilles and quiet ceiling mounted extract fans which shall operate on a run timer. Fans shall not be key switch operated and shall not run continuously. Fan to have emergency power back up, refer to car finishes section.
Maintenance Controls	A car top maintenance control unit shall be fitted on the car top in accordance with EN 81-20 shall be complete with car top light and emergency light. The unit shall be mounted vertically and secured in a position with the pushes visible from the landing. A similar unit shall be provided in the lift pit accessible from the pit refuge space.
Engineers Emergency Communications System.	Shall be a MEMCOM Unit .
Other Items to be Included by Lift Maker	(a) All wall drill fixings for shaft walls by the Lift Contractor to fix guide rails and door frames.
	(b) Pull out tests at three points for all drill fixings
	(c) Lifting beams in well
	(d) All fixings for all brackets and steelwork for machine support.
	(e) Primed and painted sheet metal fascia panels and car toe guard.
	(f) LSF Shaft wiring protected by LSF trunking and conduit.
	(g) Pit ladder to EN 81-20 .
	(h) Hand Winding floor level audible and visual signal and instructions.
	(i) Site painting of finished lift installation as required.
	(j) Testing of lift in accordance with EN 81-20 and BS8486.
	(k) Repeat testing of the lift in the presence of the Engineer

	(l) Plastic encapsulated wiring diagrams in control panel
	(m) Comprehensive Maintenance Manuals, Lift Register, Log Cards and Record Drawings ,CDM file ,in accordance with the specified requirements
	(n) 12 months maintenance during the extended guarantee period. Refer to section 9
	(o) Before the end of the Defects Liability Period the lift maintainer shall under take all annual inspections as listed under SAFED LG1 documentation. All certificates shall be issued to the engineer.

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6.5 SUMMARY OF LIFT REPLACEMENT (LIFT 4)

The minimum of the following works shall be undertaken to provide a replacement lift which complies with EN 81-20 and 50 and complies with EN 81- 70 ; EN 81-71 Category 1 ; EN 81/73 .

Number and Type of Lift	One – Machine Roomless Traction Passenger / Goods Lift
Capacity	MINIMUM 7 persons 550 kg
Speed	1.0 m/s
No. of Stops	3
Levels Served	G, 2, 4 ,
Floor Nomenclature	G, 2,4 ,
Travel	10,360 mm (as existing to be checked on site)
Well Dimensions (as existing to be checked on site)	1890 mm wide x 1760 mm deep (less 140 sill nib)
Headroom	4000 mm
Pit Depth	910 mm
Machine Position	Within top of well
Drive Systems	Gearless AC hauling machine mounted within the top of the lift well comprising of permanent magnet synchronous motor mounted on a common shaft with sheave to provide variable speed control from a Variable Voltage Variable Frequency regulated none regenerative drive.
Duty Cycle	180 starts per hour
Levelling Accuracy	+/ - 5 mm
Power Supply	Existing re terminated

Car Dimensions	1100 wide x 1300 deep x 2200 high
Number of Car entrances	One
Car Entrances	800 mm wide x 2000 mm high two panel side opening
Car Door Operators	Variable Voltage Variable Frequency linear belt drive to provide torque control over full entrance width.
Car Door Protection	2 D Infra Red Full Height Safety Edge
Landing Entrances	800 mm wide x 2000 mm high two panel side opening
Landing Entrance Surrounds	Full Wrap Around Architraves as detailed in this specification.
Door Sills	Extruded aluminium alloy . .
Mounting Arrangement	Mounted on landing nib
Landing Entrance Fire Rating	2 hours with a UK fire Certificate.
Control Systems	Simplex Down Collective
Control Features	• EN 81- Part 70 compliant • Goods control key • Manual Fire Alarm recall to main exit by Fireman's Switch
Signal & Operating Fixtures	Vandal Resistant to EN 81-70 / 71 & 73

Car Control Stations	One car control station shall be provided which shall be mounted in the car slam post side wall in the front quarter of the lift car. All fixtures will be heavy duty vandal resistant. The COP shall comprise of a full height hinged panel released from above the car and shall contain the following :- 1. CE mark & Notified Body No 2. Load Plate 3. Lift Contractors Lift Serial Number 4. Client Lift Number (Lift 4) 5. Digital Full Position Indicator to show :--,dual digit Alpha numerics OVERLOADED and direction of travel arrows. 6. Information for operation of hands free auto dialler and induction loop logo 7. Perforated grid for hands free auto dialler. Yellow illuminating indicator in form of an alarm bell to indicate alarm signal has been sent. EN 81-70 8. Green Illuminating indicator in form of a telephone handset to confirm communication connection. EN 81 -70 9. Independent/Auto goods service key switch. 10. One push button for each floor served, with adjacent tactile notation as per the indicator notation. Level G push to protrude 5 mm beyond other pushes. 11. Door OPEN Push button 12. Door Extended Open push button, 13. Door CLOSE push button 14. Alarm push coloured yellow complete with bell logo which shall illuminate under emergency lighting conditions. All pushes shall be mounted at a height of between 900 mm & 1200 mm.
Car Indicators	Min 60 mm high characters, contrasting LED illuminated LCD, digital full position indicator, to give dual digit notation protected by a vandal resistant and scratch resistant lens.
Landing Indicators (all floors)	Min 60 mm high characters , Contrasting LED illuminated LCD, digital full position indicator, to give numeric notation and next direction of travel arrows and pre arrival annunciation electronic chimes. Incorporating energy saving sleep feature. Mounted vertically above the landing pushes.
Landing Pushes	Heavy Duty Vandal Resistant pushes at all floors with LED call accept illumination and LED illuminated tactile notation and audible feedback
Landing Tactile signage	Cast aluminium architrave jamb plates and tactile notation to be mounted on the architrave jambs.
Control Panel	Control panel located in accessible located from top floor landing or mounted in a maintainable position from the car top with Auxiliary Emergency controls accessible from the landing. Control features to include :- Car light and fan switch off timer Indicator reduced illumination mode

	Drive economy mode Indicator switch off modes Peripheral switch off mode Independent Service Key switch Lift isolation key switch .
Landing Accessible Controls	To include :- Manual movement switch. Electrical recovery push button controls. Fault diagnostic switch. Main and auxiliary supply circuit breakers.
Guide Rails Car	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m lengths) 16 mm blade
Guide Rails Counterweight	Undercut tee sections selected in accordance with EN81/1 Annex G. (5 m Lengths) min 10 mm blade
Guide Shoes	Min 200 mm long Sliding type with removable liners
Car Safety Gear	Type Tested Progressive type.
Car Safety Gear Operation	Over speed Governor mounted within the top of the well with remote test facility.
Upward over speed device	100% redundancy of brake
Prevention of movement with doors open	CE certified system to EN 81-20 .
Car Top Refuge	The car top refuge in accordance with EN 81-20 shall accommodate space for one man.
Buffers	Energy Accumulation type.
Emergency Lighting	To be supplied from UPS unit having adequate capacity to provide power to all of the car lights supply the alarm push LED's; supply the hand winding audible signal ; the car top emergency light ; alarm signal and fan for 3 hours.

Emergency Communications System	Hands free Auto Dial system. To be a MEMCOM + system with the car unit installed behind perforations in the COP and two further units , a car top and engineers unit in the lift pit accessible from the refuge space.
Emergency Recovery (ARU / EBD)	The lift shall be provided with an Automatic Emergency Battery Recovery Drive to drive the lift car to floor level and open the doors in the event of a power failure.
Alarm System	The alarm system shall comprise : Yellow alarm push on car control station complete with bell logo Approved sounder mounted above main landing entrance of a different tone to the fire alarm system. To be supplied from a separate power pack. The sounder to provide an output of not less than 95 dBA.
Car Ventilation	Concealed low level grilles fitted with external baffle plates and insect grilles and quiet ceiling mounted extract fans which shall operate on a run timer. Fans shall not be key switch operated and shall not run continuously. Fan to have emergency power back up, refer to car finishes section.
Maintenance Controls	A car top maintenance control unit shall be fitted on the car top in accordance with EN 81-20 shall be complete with car top light and emergency light. The unit shall be mounted vertically and secured in a position with the pushes visible from the landing. A similar unit shall be provided in the lift pit accessible from the pit refuge space.
Engineers Emergency Communications System.	Shall be a MEMCOM Unit .
Other Items to be Included by Lift Maker	(a) All wall drill fixings for shaft walls by the Lift Contractor to fix guide rails and door frames.
	(b) Pull out tests at three points for all drill fixings
	(c) Lifting beams in well
	(d) All fixings for all brackets and steelwork for machine support.
	(e) Primed and painted sheet metal fascia panels and car toe guard.
	(f) LSF Shaft wiring protected by LSF trunking and conduit.
	(g) Pit ladder to EN 81-20 .
	(h) Hand Winding floor level audible and visual signal and instructions.
	(i) Site painting of finished lift installation as required.
	(j) Testing of lift in accordance with EN 81-20 and BS8486.
	(k) Repeat testing of the lift in the presence of the Engineer

	(l) Plastic encapsulated wiring diagrams in control panel
	(m) Comprehensive Maintenance Manuals, Lift Register, Log Cards and Record Drawings ,CDM file ,in accordance with the specified requirements
	(n) 12 months maintenance during the extended guarantee period. Refer to section 9
	(o) Before the end of the Defects Liability Period the lift maintainer shall under take all annual inspections as listed under SAFED LG1 documentation. All certificates shall be issued to the engineer.

6.6 Car Interior Schedule of Finishes and Designated Materials Lift 1-4

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All stainless steel used in the construction of the lift cars shall be 316 Grade Stainless Steel.
All fixings used in the assembly of the lift car below ceiling height shall be stainless steel.
All ferrous fixings used in the construction of the car sling shall be zinc coated .
All joints between panels shall be sealed with a chemical resistant sealant to make walls impervious to fluids.

Front Wall/ Returns	Shall be rigidly constructed with an internal steel goal post frame and finished externally in Linen Patterned stainless steel.
Side Walls	Shall be constructed of a number of narrow pressed stainless steel panels. The walls shall be externally braced and reinforced with a top hat section stainless steel section at approx 500mm above floor level. The walls shall be finished in Linen patterned stainless steel.
Rear Wall	Shall be constructed of a number of narrow pressed stainless steel panels. The walls shall be externally braced and reinforced with a top hat section stainless steel section at approx 500mm above floor level. The walls shall be finished in Linen patterned stainless steel.
Dado Rail	A linen finish Dado rail shall be mounted around the side walls of the car. The Dado rail will form a bottom frame for the mirror. The handrail shall be mounted on the dado rail each side of the COP.
Mirror	Mirror to be mounted on rear wall Full width laminated mirror extending from ceiling line to dado level. Mirror to have manifestation bead blasted into the rear of mirror. The mirror to be mounted in a tamper proof frame.
Hand Rail	The handrail shall be tubular steel with a polyester coating coloured blue. The handrails shall be mounted in one piece on the wall opposite to the COP, mounted on the Dado rail. The handrails shall be mounted 900mm to the upper surface from FFL.

Car Operating Panel	Mounted in car side wall on the car entrance slam side in the front quarter of the lift car. 316 grade grit finished stainless steel
Ventilation	Ventilation apertures shall be provided at low level only and they shall be protected on the exterior of the car by the provision of deflectors to prevent foreign objects being passed through then. Forced ventilation is to be provided from an exhaust fan mounted on the car roof and it shall be fitted with covers to afford protection against accidental damage by personnel, both internally and externally. The type and design shall be submitted for approval. It shall be designed to provide a minimum of five air changes per hour and is to be controlled by operation of the lift . The fan will be connected into the emergency alarm circuit and operation of the alarm will cause the fan to come into operation. A variable timer is to be provided with an operating range of zero to 45 minutes and after operation of the alarm, the fan will continue to operate for the duration of the timer setting.
Ceiling	The underside of the box section ceiling of the car shall be finished in satin stainless steel to assist in the reflection of the car lighting.
Lighting	The car to be illuminated by 6 vandal Resistant LED cluster lights to provide a minimum of 150 lux (note) at floor level and on the car control station. Elevator Electrical Equipment Limited Ref 20025 Pure white provided in two separate circuits with two power supplies.
Emergency Lighting	The car light shall be supplied via the UPS to provide a min of 3 hours illumination of all of the LED light fittings.
Skirting	A 75mm high recessed stainless steel skirting shall be provided around the side walls of the lift car.

Floor covering	Single sheet of chemical and burn resistant 3mm thick studded vinyl shall be fitted which shall be coved and welded to the underside of the overhanging walls and the perimeter sealed against water ingress.. Ref : Polyflor Hydro, 2 mm thick, colour: Blue Forge ref H4850 which shall be coved and welded to the underside of the overhanging walls and the perimeter sealed against water ingress.
Car Doors	The car doors shall be finished in linen stainless steel.

6.7 Landing Finishes

Landing Doors	316 Grade Linen pattern stainless
Landing Doors Surrounds	To match landing door finishes.
Landing Architraves	To match landing door finishes
Landing Face Plates	316 grade grit finish
Indictor face plates	316 grade grit finish

Final car details must be submitted for approval

TECHNICAL SPECIFICATION

SECTION 7

7.0 INFORMATION FOR APPROVAL, NOTICES AND TECHNICAL SPECIFICATION

7.1 Information for Approval and Notices

The Lift Contractor shall provide a cost value within the Summary of Prices for the allowance of a qualified draughtsperson.

The Lift Contractor shall ensure a full site survey is undertaken and full consideration given to critical dimensions, product range, speed and loadings prior to the submission of GA drawings as listed below.

During analysis of tenders, Contractors will be requested to explain their proposed engineering processes for this project.

The Lift Contractor must take all necessary dimensions on site during the progress of the works.

Before commencing manufacture the following working drawings shall be submitted for approval of the Engineer.

Item	Description
a)	General arrangement and builders work detail, shaft.
b)	Car enclosure, car doors, landing entrance complete with frame fixing details (where applicable).
c)	Car design, Perspective and Manufacturing Drawings.
d)	Sketch drawing of proposals for landing protective hoardings.
e)	Car operating panel engraving details.
f)	Landing push and indicator details.

After approval, each drawing shall be submitted for use during the duration of the Contract. Electronic copies shall be provided in PDF format or equal as advised.

The Lift Contractor shall submit, no later than the date of submission of the initial General Arrangement Drawings, a schedule of the electric power and lighting requirements for the lift installations.

The information shall be complete in all respects and will include confirmation of the kW ratings, full load and starting currents, fuse ratings, permitted volt drop and a line diagram of the switch gear arrangement in the machine room, for the 3-phase and single-phase supplies.

Any additional requirements for ancillary equipment, such as communications or diagnostics, shall be fully detailed with all information on cabling and terminations.

On completion of the work, the Lift Contractor shall provide and fix in the machine room a suitably mounted ‘straight line’ and ‘as wired’ set of wiring diagrams of all electrical apparatus of the lift as actually wired and fitted and showing the arrangement and markings of all connections. These diagrams shall be plastic laminated or equivalent finish to approval.

Similarly, nomenclature detailing all symbols and forms of identification used on the equipment drawings or circuit diagrams applicable to the equipment, encapsulated in plastic of equivalent to approval, shall be mounted alongside the circuit diagrams.

Full information in respect of the heat output and operating temperature range of the equipment is to be provided.

7.2 *Notices*

All danger, warning or advisory notices as may be required by LOLER or PUWER, and by BS EN 81-20, BS EN81-50, BS EN81-72, BS5655 and BS7255, which are applicable to this Contract, shall be provided and installed by the Lift Contractor. These shall comply in all respects with the requirements of British Standards and BS EN ISO 7010 safety sign regulations and shall be screen printed on plastic laminate or equivalent material with 12 mm minimum height lettering.

All notices shall be screw fixed. Self-adhesive notices will not be accepted.

7.2.1 *Hand Winding Notice*

The Lift Contractor shall provide and install diagrammatic and written hand-winding instructions which shall be mounted in an appropriate and prominent position where these may easily be read when carrying out emergency hand-winding operations.

The instructions shall be specific to the site and to the lift equipment and machinery installed.

The notice shall be a minimum of 500 mm wide x 500 mm high and shall be in English and clear and legible.

The design of the notices shall comply in all respects with the requirements of BS EN81-20, BS EN81-50, BS5655, BS7255 and LOLER and PUWER.

7.2.2 *Notices*

The Lift Contractor shall supply and install, adjacent to the lift main switch fuse, an Electric Shock Notice, which is in accordance with the Electricity at Work Act,

The Lift Contractor shall supply and install a notice upon the electrical consumer unit which identifies the all of the circuits and their particular fuse ratings.

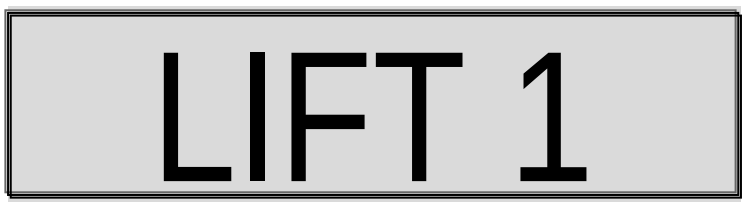
The Lift Contractor shall supply and install, to all electrical switches within the lift machine room and/or machinery areas, a permanently fixed label identifying their function.

7.2.3 *Lift Identification Numbers*

Lift identification numbers stating “LIFT1,2,3 or 4 ” or shall be provided in the following locations on each lift :-

a) Each landing entrance header
b) On the Car top and pit control station
c) Adjacent to each pit stop switch
d) With the lift car at the top of the Car Operating Panel
e) On each lift control panel
f) On the main supply isolator

Identification Numbers on landings, on the car operating panel & landing maintenance control panel shall be engraved on matching material to the approval of the engineer.



7.3 *MACHINE AREA (MRL)*

7.3.1 *Lift Machine*

The gearless machine shall comprise a slow speed traction sheave directly coupled to an electric motor and incorporating an electro-mechanical brake. The whole assembly shall be carried on various fabricated steel. Transmission of vibration to the fabric of the building shall be prevented by the use of proprietary anti-vibration mountings. The Lift Contractor is to ensure that his offer includes for all necessary steelwork to accommodate the lift machine. The lift machine shall be configured such as provide safe access for maintenance and adjustment processes. The whole assembly is to be designed and tested to sustain contract load plus 25% over-load, and shall be designed constructed and installed in accordance with the requirements of BS EN81-20.

The hoisting motor shall be a Single Speed permanent magnet Motor, which is designed specifically for use with inverters, and rated for the duty set out in this Specification. The speed of the motor shall not exceed 300 rpm. The design and construction of the motor shall be in accordance with the requirements of the BS EN60034 Standards.

Suitably designed motor protection shall be provided and shall be by way of thermistors which are embedded in the motor windings. Minimum of three separate thermistors shall be used.

The design shall be such as to incorporate an electronic sensor in the control system which shall be configured to monitor the motor speed control encoder/device such that the electronic sensor shall detect any error and/or fault condition which may arise and operate to isolate the motor electrical supply within 3 seconds of an error or fault condition arising.

The motor shall bear a name-plate which clearly sets out the manufacturer's details together with the motor design information and serial number.

A suitable design permanent and resilient metal sign shall be installed at the hand-wheel end of the motor casing shall clear designate the direction of rotation and corresponding movement of the lift car.

All moving parts of the lift machine shall be suitably guarded in accordance with the requirements of this Specification and those of BS EN ISO14120 and BS EN81-20. All prime movers shall be painted in safety yellow.

The lift machine shall incorporate a means of manual operation the design and application of which shall be such that the manual effort required to move the lift car, in the empty car and loaded to rated load plus 10% conditions, shall not exceed 150 N.

In the case of a permanently installed flywheel/hand winding wheel this shall be guarded in accordance with the requirements of BS EN81-20 and the requirements of this Specification.

The direction of the lift car movement corresponding to the rotation of the hand winding wheel shall be permanently marked upon the lift machine, and in close proximity to the location of the hand winding wheel.

In cases in which the design of the lift machinery is such that the manual effort required to move the fully loaded lift car upwards is in excess of 400 N, and/or if no mechanical means of emergency operation in accordance with c.5.9.2.3.1 of BS EN81-20 is provided, the Lift Contractor shall supply and install a means of emergency electrical operation which is designed, constructed and installed in accordance with the requirements of Section 5.12.1.6 of BS EN81-20 and with the requirements of this Specification.

7.3.2 *Traction and Divertor Sheave*

All lift machine traction sheaves and rope diverter pulleys shall be painted yellow, and suitably designed rope restraints shall be installed such as to prevent the suspension ropes from leaving the sheave/pulley grooves.

The lift machine traction sheave shall have sufficient diameter to ensure that the ratio between traction sheave and suspension rope diameter is not be less than 40:1.

All bearings shall be cylindrical roller bearings.

The roping system shall be 2:1

7.3.3 *Roping Arrangement*

Each lift shall be designed such that the lift car is configured in an under-slung arrangement and applying a 2:1 suspension roping arrangement. Lifts cars configured in an over-slung arrangement may also be considered, to suit the manufacturer's standard arrangement, but subject to the approval of the Engineer.

Overhead rope diverter sheaves shall be located outside of the footprint area of the lift car in order to ensure safe operation, safe access for maintenance and to minimise headroom requirements.

The rope diverter sheaves which are located below the lift car platform shall be configured in a manner such as to minimise the effects of offset forces from the ropes and to allow the lift car to be satisfactorily statically balanced at all points in the lift travel. All diverter sheaves shall have a minimum sheave to rope diameter ratio of 40:1. Any replacement bearing shall be cylindrical roller bearing.

The Lift Contractor shall supply and fix all necessary steelwork to support the diverter sheaves and suspension rope hitches for each lift.

The location for the governor shall be in the lift shaft. The Lift Contractor shall provide a means to remotely trip and reset the governor from outside of the lift shaft.

7.3.4 *Machinery Guarding – General Requirements*

The design and construction of machinery guards shall meet with all of the requirements of *Section* 1.4 of *The Supply of Machinery (Safety) Regulations* 2008 and with the requirements of PUWER 1998, BS EN81-20 and BS EN81-50, the Lifts Regulations 2016 and EU Lifts Directive 2014/33/EU, and shall be fully compliant with the requirements of BS EN ISO14120: 2015 *Safety of Machinery - Guards - General Requirements for the Design and Construction of Fixed and Moveable Guards*.

All guarding shall be designed and constructed to offer adequate, clear and satisfactory viewing of the components guarded in order to meet maintenance, lubrication and inspection requirements. Wherever possible this shall be achieved without requiring the complete removal of the guard.

Machinery guards shall be designed to be of suitable size and weight to permit ease of handling and shall be designed such that these may only be removed with the aid of a tool. The guards shall be designed in order that they do not cause hazardous crushing or trapping points with reference to parts of the machinery being guarded or other guards. Wherever practicable, guards shall be designed such that these are unable to remain in place without their fixings.

The guards shall be so constructed as not to have exposed sharp edges, corners or other hazardous projections. Welded, bonded or mechanically fastened joints shall be of sufficient strength, number and spacing to ensure the

stability and rigidity of the guard so that it remains secure under all foreseeable loading conditions. In particular guards shall be designed to withstand reasonably foreseeable impact from parts of the machinery and any ejected solid or fluid materials. All fastenings shall be fitted with lock nuts, spring washers or other features to ensure these are resistant to machinery vibration and remain attached to the guard/machine.

Guards shall be formed from materials that allow the protective properties of the guard to be maintained throughout the foreseeable life of the machinery. Supports, frames and all infill materials shall be selected from a range to provide a rigid and stable structure and to resist deformation. The materials selected for the construction of the guard are to be resistant to foreseeable oxidation and corrosion and other environmental factors. This may be achieved through the application of suitable protective coatings.

7.3.5 *Guarding - Sheaves*

The traction and divertor sheaves (and over-head and lift shaft pulleys) shall be guarded by suitably designed perforate, removable guards which shall be designed and constructed in full compliance with all of the requirements of *Section* 1.4 of *The Supply of Machinery (Safety) Regulations* 2008 and with the requirements of PUWER 1998, BS EN81-20 and BS EN81-50, the Lifts Regulations 2016 and EU Lifts Directive 2014/33/EU, and shall be fully compliant with the requirements of BS EN ISO14120: 2015 *Safety of Machinery - Guards - General Requirements for the Design and Construction of Fixed and Moveable Guards*.

All guarding shall be designed and constructed such as to offer adequate, clear and satisfactory viewing of the components guarded in order to meet maintenance, lubrication and inspection requirements. Wherever possible this shall be achieved without requiring the complete removal of the guard.

All guards must be securely held in place by fixing/securing systems which may be opened/ released only by the application of suitable tools. These fixing/securing systems shall remain attached to the guard when the guard is removed. Suitable tools shall be supplied and installed on the tool-board to ensure easy access for maintenance.

7.3.6 *Brake*

The lift machine brake shall be of spring applied, electrically released design and shall be of heavy-duty construction complete with the necessary brake shoe/pad to brake drum/disk contact surface area to suit the load and speed of the lift. The design of the brake shall be such that this shall incorporate no less than two separate brake shoes/pads which are configured such as to be self-aligning. Each brake shoe/pad shall incorporate its own specific actuation device and guided compression spring and housing. The lift machine brake shall, in all respects, be designed and constructed in accordance with the requirements of BS EN81-20 and BS EN81-50

The machine brake, unassisted by any other equipment of the lift, shall be designed such that this shall safely stop the lift machine when the lift car loaded with 125% of rated load, is travelling downwards at rated speed, such that the average retardation of the lift car shall not exceed that arising during safety gear and/or buffer operation.

The design of the lift machine brake shall incorporate redundancy such that all of the mechanical components of the brake, including any solenoid plunger, which are involved in the application of the braking action on the brake drum, shall be provided in two separate sets. Each of the two sets of braking components shall be designed and constructed such as to apply a braking effort which is sufficient to decelerate, stop and hold the lift car, loaded at rated load and travelling downwards at rated speed; and when travelling upwards with the lift car empty.

The brake drum/disk shall be coupled by direct and positive mechanical means to the lift machine traction sheave, winding-drum or sprocket.

The lift machine brake solenoid shall be designed for a DC electrical supply sourced from suitably rated rectifiers in the lift control system. The supply shall be controlled by at least two electromechanical devices which shall be designed and applied in accordance with the requirements of Section 5.10.3.1 of BS EN81-20. These electromechanical devices shall be designed and configured such that if, whilst the lift is stationary, one of these has failed to open the electrical circuit to the machine brake solenoid, then further movement of the lift car shall be prevented. The effect of any stuck-at-failure monitoring of this system shall be such as to prevent further movement of the lift car.

Alternatively, the lift machine brake shall incorporate an electrical monitoring circuit which is designed and configured in accordance with the requirements of Section 5.11.2.3 of BS EN81-20. In case in which this method is applied the Lift Contractor shall provide a Certificate of Type Examination which is in accordance with the requirements of Section 5.6 of BS EN81-50.

The design shall be such that electrical current shall not be applied to the lift machine brake solenoid unless the lift drive motor has been powered. The brake shall be designed to apply instantly and automatically in the event of interruption of the power supply to the solenoid.

The lift machine brake shall be designed such as to incorporate a means whereby the brake may be released manually, by way of continuous manually applied pressure, in order to enable hand winding of the lift machine. The design and construction of the means of manual release shall be such that this cannot cause a failure of the braking function.

In cases in which the lift machine is installed within the lift well it shall be possible to test each of the braking sets from outside of the lift well.

7.3.7 *Emergency operation*

The Lift Contractor shall provide a suitable means by which the lift car can be moved in a controlled manner, from a suitable and safe position which is external to the lift shaft.

The means provided shall be designed and constructed in accordance with the requirements of BS EN81-20. 5.9.2.3.1 b)

If the means is in any way reliant upon the lift car and counterweight being out of balance in order to achieve movement of the lift car then the lift contractor shall install a suitable means of ensuring that the lift car may be safely moved under an out of balance condition.

7.3.8 Electrical Emergency Operation

The Lift Contractor shall include to supply and install a suitable electrical emergency operation system, which is designed and constructed in accordance with the requirements of BS EN81-20.

The system shall incorporate a separate battery power supply and automatic charging system, and shall be design and constructed such as to be capable of moving the fully loaded lift car, in either direction of travel, at a speed not exceeding 0.3 m/sec, to a landing such that passenger release may be safely effected.

The provision shall include a means to readily and accurately indicate the position of the lift car to the person undertaking the emergency operation.

In all cases a manually operated means emergency operation, which is designed and constructed in accordance with the requirements of c.5.9.2.3.1 of BS EN81-20, shall be provided in addition to the emergency electrical operation.

The means to operate the emergency function shall be located in the emergency and intervention panel.

The system shall incorporate a self-checking 'fail safe' facility in order to ensure full functionality and battery condition at all times. In the event of malfunction or failure a signal shall be initiated in the lift controller fault logging system (or BMS system if fitted) and the lift car shall home automatically to the nearest floor and park with its doors open.

7.3.9 Automatic Rescue Device (ARD)

The Lift Contractor shall include to install a suitable automatic rescue device (ARD), powered by a trickle charged battery source, each to be provided as part of the contract.

The ARD system shall be designed to enable the automatic and safe rescue of passengers from a stalled lift due to loss of power supply.

The ARD shall be integrated with the lift controller and shall continuously monitor and detect any loss of mains power. In the event of a mains electrical supply failure, the ARD shall monitor the lift safety circuits, doors locks and Inspection/Normal functions. Provided that the safety circuits are in the 'normal' condition and provided also that the lift is not on Inspection Control, the ARD shall cause the lift to move to the nearest landing, stop at floor level, open its doors and keep them parked open.

The ARD functionality shall be disabled whenever the loss of mains power is due to the lift having been manually switched off at the mains isolator. Therefore, the design shall incorporate a means to detect whether the lift main switch has been physically switched off or whether an electrical mains failure has occurred. For example, a 4 pole mains isolator could be used for this purpose with the 4th pole used to activate or isolate the ARD interface as appropriate.

The ARD shall also incorporate a self-checking 'fail safe' facility to ensure full functionality, battery condition etc. If failure is detected, a signal shall be sent to the fault logging system (or BMS system if fitted) and the lift shall home automatically to the nearest floor and park with doors open.

Whenever an automatic rescue is triggered, either by an electrical mains failure, or self-test/battery condition functionality failure, in each case manual intervention shall be required to reinstate the lift to normal passenger use.

Full details <u>including</u> EHO/HSE approval of the system shall be provided with the offer.

7.3.10 Hand Winding Position Indicator

In order to assist emergency hand-winding/lowering operations, an emergency hand winding position indicator shall be provided. This shall indicate the position of the lift car during the hand winding process and shall incorporate a separate indicator and buzzer to indicate when the lift car is positioned level with a lift landing and/or within the landing unlocking zone. The device shall have a separate electrical supply which is configured to feed a self-contained low voltage, auto re-charge battery pack with rechargeable nickel cadmium batteries.

7.3.11 Overspeed Governor

A robustly designed and constructed overspeed governor complete with governor rope and tension pulley frame shall be provided. The design and construction shall be such that the overspeed governor rope and its terminations shall remain intact during engagement of the safety gear.

The design of the overspeed governor shall be such that the tensile force produced in the governor rope when the governor is tripped shall be at least twice the force necessary to operate the safety gear and in no case less than 300 N.

The design and construction of the overspeed governor shall be such that the maximum distance between tripping shall not exceed 250 mm relative to the movement of the governor rope.

The design, construction and installation of the overspeed governor, together with its associated components, shall be in accordance with the requirements of BS EN81-20. Electrical devices shall be designed and constructed in accordance with the requirements of Section 5.11.2 of BS EN81-20.

The overspeed governor shall be subject to Type Examination in accordance with the requirements of Section 5.4 of BS EN81-50, the Lifts Regulations 2016 and Directive 2014/33/EU, and a Type Examination Certificate which is in accordance with the requirements of c.5.4.3 of BS EN81-50 shall be provided and a copy retained in the lift O&M Manual.

The overspeed governor shall be designed such as to meet the requirements of the particular lift speed and safety gear design, and in accordance with the respective electrical and mechanical tripping speeds specified in BS EN81-20. The governor rope shall be easily detachable from the safety gear such as to ease testing and maintenance.

The pitch diameter of the overspeed governor and of its tension and diverter pulleys shall be no less than 30:1 in relation to the diameter of the governor rope.

The governor rope shall be tensioned by way of a pulley and tension weight which shall be securely guided. Breakage or excessive stretch of the governor rope shall be detected by an electrical device which is designed and constructed in accordance with the requirements of Section 5.11.2 of BS EN81-20.

The governor rope shall be designed and constructed in accordance with the requirements of BS EN12385-5 and with a minimum safety factor equivalent to eight times the tensile force generated in the governor rope and based upon a friction factor of 0.2 for traction governors.

The overspeed governor shall be located such that this is readily accessible and reachable for maintenance and testing purposes from outside of the lift well. This requirement may, with the agreement of the Engineer, be dis-applied providing that all of the following provisions are met:

- The design shall be such that the governor may be remotely tripped from outside the well, and;
- That the governor is readily accessible from the lift car roof or pit, and;
- The mechanical reset of the governor is automatic upon the raising of the lift car, and the governor electrical devices may be reset by remote means.

A means shall be provided for testing purposes to allow the governor to trip when the car is travelling at normal speed.

The direction of rotation corresponding to the operation of the safety gear shall be permanently and indelible marked upon the governor.

Governors which incorporate adjustable speeds shall be sealed such that adjustment causes the seal to be broken.

Governor and pulley guards shall be provided and shall be designed in accordance with the requirements of BS EN81-20, BS EN ISO14120 and the requirements of this Specification, and such as to allow the governor trip

mechanism and switches to be reset without the need for removal of the guard. The data plate details shall be repeated on the top of the guard.

7.3.12 Control Panels (Machine Room-less)

The control equipment shall be totally enclosed in a steel cabinet with louvered ventilation and hinged doors exposing all components for accessibility, and design and constructed in accordance with the requirements of Sections 5.10 and 5.11 of BS EN 81-20. Forced ventilation fans complete with suitable filters shall be applied wherever necessary in order to ensure the correct operating environment for the control components.

The control and drive system, together with its various elements of equipment and enclosures, shall be designed and constructed in accordance with the requirements of BS EN81-20, BS EN50274, BS EN60204-1, BS EN60529, BS EN60664-1, BS EN60947-4-1, BS EN60947-5-1, BS 60800-5-2, BS EN61810-1, HD60364-4-41, HD60364-4-42 and HD60364-6.

All main components including circuit boards, transformers, power supplies, relays, contactors, fuses, overloads and associated equipment shall be suitably identified, by way of permanent indelible labeling, and a nomenclature compatible with the circuit diagrams shall be provided.

The motor windings shall be protected by way of suitable thermistors which shall be electrically connected to detection units which are designed to provide a level of protection commensurate with the motor manufacturer's recommendations.

All solid state/thermistor/micro-processor based control circuits shall be fed from electrical power supplies providing the correct voltage, and with all necessary over and under voltage and current protection devices, such as to ensure their correct and safe operation. Circuits shall be designed in accordance with current British Standard requirements such that in case of failure this is to a safe condition.

A device shall be incorporated within each controller which will detect a loss of one phase of main electrical supply or a reversal of the phases. Where the device detects either of these conditions a switch, relay or contactor shall be rendered open circuit removing the supply to all relevant contactors and control panel circuitry, and preventing movement of the lift.

Lift speed regulation over the range between no load and full load shall be within 5% of the contract speed.

The entire lift installation shall run normally when the supply voltage varies to a limit of +10% and -6% of the declared supply voltage.

The electrical supply to the drive motor shall be controlled be at least two independent contactors. If, when the lift is stationary, the main contacts of one of the contactors should fail to fail to open any further movement of the lift shall be prevented. Alternatively a stuck-at-failure monitoring system shall achieve the same result. Alternative systems of protection, which shall be designed and constructed in accordance with the requirements of BS EN81-20 may be proposed of the approval of the Engineer.

The controller shall prevent the lift machine starting unless the car door is in the closed position and all landing doors are in the closed and locked position, unless using the door bypass device as Sections 5.11.2 and 5.12.1.8.3 of BS EN81-20.

A means of lift position indication based upon a digital display shall be provided within the control panel.

Permanent provision shall be made for inserting lift car and landing calls within the cabinet and this shall remain accessible and functional at all times, and for isolating landing calls, remote commands and to disable automatic door operation.

An inspection control station which is designed and constructed in accordance with the requirements of Section 5.12 of BS EN81-20 shall be incorporated in each of the control panels. The lift shall remain in inspection mode until all inspection control stations are set to the normal operation condition.

A landing and car door bypass device shall be provided in the lift controller. The device shall be designed and constructed in accordance with the requirements of Sections 5.11.2 and 5.12.1.8.3 of BS EN81-20. The device shall be protected against unintended use and protected mechanically by means of a permanently installed robust and secure guard or by way of a plug socket combination. The device shall be marked 'Bypass' and that activation status of the device shall be clearly marked. When operated the Bypass Device shall: normal operation including that of automatic doors shall be prevented; the bypassing of the lift landing door contacts and locks and the lift car door contacts and locks shall be possible, although the simultaneous bypassing of both car and landing door contacts and locks shall be prevented; a separate monitoring signal shall be provided such as to provide a check that the car door is in the closed position during lift movements with the car door bypassed; movement of the lift car shall be possible only under inspection control operation or emergency electrical control operation; and audible signal at the lift car (minimum 55 dB(A) measured 1 m below the lift car) and a clearly visible flashing light under the lift car shall be activated during movement of the lift car. In the case of manually operated doors or gates the simultaneous bypass of the landing door contacts and landing door locks shall be prevented.

The controller shall incorporate a device which is configured such as to verify the correct operation of the lift door contact circuits whenever the lift car is within the unlocking zone, the car door is open and the landing door lock is released. The device shall monitor the monitor the condition of the electrical device which proves the closed condition of the lift car door, the electrical device proving the locked condition of the landing door locking device and the monitoring signal associated with the 'Bypass' device, in order to detect malfunction and to prevent the normal operation of the lift.

An Emergency Electrical Control Operation device shall be provided, and shall be designed and constructed in accordance with the requirements of Section 5.12.1.6 of BS EN81-20.

All wiring within the control panel cabinet shall be properly and securely terminated. Any spare wires which are run to the panel shall be properly segregated and insulated from any live circuits and components and shall be suitably identified.

A rubber isolation mat, which is design and constructed in accordance with the requirements of BS EN61111, shall be provided in front of the control panel cabinet and at the rear of the panel in case where access may be required.

Portable and/or hand held devices which permit the interrogation of the lift control system shall be provided to the Purchaser complete with detailed instructions for safe use of the device. The device shall be provided free of any additional charge, hire, rental, lease or license and the device and its associated software shall remain functional the service life of the lift installation.

The controller shall incorporate a means to detect the temperature of the lift machine space and configured such as to isolate the lift in accordance with the requirements of BS EN 81-20 should the temperature limit of the equipment be exceeded.

The control system shall be designed to meet the requirements of BS EN12015 and BS EN12016 in relation to Electro-Magnetic Compatibility (EMC). A valid Declaration of Conformity shall be provided as evidence of compliance.

7.3.13 Drive System

The lift drive control system shall be of the variable voltage variable frequency AC type utilising full flux vector or direct torque control of an AC motor, to provide smooth, step less acceleration/deceleration and stopping cycles and to achieve a floor level stopping accuracy of ±5 mm.

The drive system shall be closed loop system utilising a tacho generator and/or digital encoder directly coupled to the hoist motor or geared machine high-speed shaft, to provide a speed feedback/motor shaft position reference.

Speed regulation between no load and full load shall be within 5% of the contract speed.

The entire lift installation shall run normally when the supply voltage varies to a limit of +10% and -6% of the declared supply voltage.

The electrical supply to the drive motor shall be controlled be at least two independent contactors. If, when the lift is stationary, the main contacts of one of the contactors should fail to open any further movement of the lift shall be prevented. Alternatively, a stuck-at-failure monitoring system shall achieve the same result. Alternative systems of protection, which shall be designed and constructed in accordance with the requirements of BS EN81-20, may be proposed of the approval of the Engineer.

The drive system shall prevent the machine starting, unless the car door is in the closed position and all landing doors are in the closed and locked position.

The control and drive system, together with its various elements of equipment and enclosures, shall be designed and constructed in accordance with the requirements of BS EN81-20, BS EN50274, BS EN60204-1, BS EN60529, BS EN60664-1, BS EN60947-4-1, BS EN60947-5-1, BS 60800-5-2, BS EN61810-1, HD60364-4-41, HD60364-4-42 and HD60364-6.

The drive system shall be designed to meet the requirements of BS EN12015 and BS EN12016 in relation to Electro-Magnetic Compatibility (EMC). A valid Declaration of Conformity shall be provided as evidence of compliance.

7.3.14 Diagnostics

The lift control system shall incorporate facilities for fault and event diagnostics in the form of a microcomputer which shall be capable of being interrogated at the controller. The information shall be presented as a digital display and, if coded, the appropriate key shall be listed on a label fixed to the interior of the controller and in the O&M Manuals.

The following list of faults and events shall be the minimum requirement, as detailed in BS EN627:

Code	Fault
00	No faults recorded.
01	Safety circuits interrupted.
02	Lock circuit interrupted whilst running.
03	Failure of normal door closing sequence.
04	Car stopped outside door unlocking zone.
05	Stuck call button.
06	Lift failed to start.

07	Low voltage on the lift logic supply.
08	Not allocated.
09	Failure of the self-test procedure.
10	Run-time limiter operated.
11	Position lost.
12	Excessive temperature of drive system.
13	Failure of normal door opening sequence.

Code	Event
40	No events recorded.
41	Main lift supply switched off.
42	Inspection control mode.
43	Fire service mode.
44	Data logging OFF (Engineer on site).
45	Car preference mode.
46	Emergency power operation.

Code	Alarm Code for Lifts
90	Alarm button pressed.

The record shall be held in the memory of the microcomputer in real time and shall be retained in rolling sequence of up to 5 timed occurrences of each of the listed fault or event. The system shall incorporate a facility for recognising and reporting that there have been more than 5 recurrences of any one fault or event and the first and last shall be retained in the memory. Upon clearance of a fault, the date and time shall be recorded and the next occurrence of the fault shall be reported as the first.

The equipment shall be configured such that a micro-computer may be applied to interrogate the system and through a serial link to a remote location or modem into a communication network, whereby each lift may be interrogated.

The remote equipment shall be capable of receiving data transmitted in the following minimum format:

a) V21 class 300 baud, asynchronous half duplex; and
b) Standard ASC11 code.

The memory shall be maintained by a back-up battery supply against a mains power failure for a minimum of 100 hours.

If the information at the controller is accessed by a portable reader, then one such reader shall be supplied to become the Purchaser's property, together with one copy of the operating manual containing a key to the codes and all operational and servicing information relevant to the diagnostics system.

7.4 *Fire Alarm Automatic Recall (BS EN81-73:2016)*

7.4.1 Behaviour of Lifts in the Event of Fire

The lifts shall operate in accordance with the requirements of BS EN81-73:2016.

The lift controller shall be configured such as to include a fire recall mode which may be initiated on receipt of electrical signals provided by an automatic fire detection and alarm system, or where applicable, by way of the manually operated system.

The fire recall system shall be capable being activated by the operation of voltage free contacts or by way of a manually activated recall switch.

If, at the time of activation, the doors are closed, the lift car shall travel non-stop to the designated floor where the lift shall remain inoperable.

If, at the time of activation, the lift car is at a landing, other than the designated landing, with open doors an audible signal shall sound within the lift car and shall continue until the doors are closed. If after 20-seconds the doors are not closed the door protection devices shall be rendered inactive and the doors shall close with reduced kinetic energy, not exceeding 4 J, and with an acoustic warning signal in operation during the door closing cycle. The lift shall then travel non-stop to the designated landing.

If, at the time of activation, the lift car is descending, the lift car shall continue to the designated landing without stopping and on arrival the lift doors shall open.

If, at the time of activation, the lift car is ascending, the lift car shall decelerate and stop normally at the next available floor and shall then return to the designated landing where the doors shall open.

On arrival of the lift car at the designated landing an audible speech message and a visual signal, each indicating 'Fire alarm – lift out of service – exit now', shall be initiated within the lift car. The doors shall remain open for 20-seconds after which the doors shall close and the lift shall be removed from service, with only the lift car interior door open and emergency alarm buttons remaining operational.

If the design of the building provides for more than one designated landing then separate pairs of volt free contacts, or suitable signalling system, shall operate in order to recall the lift car and park this at the appropriate designated landing following the same control sequence as is set out here above.

A prohibition sign, which is designed in accordance with the requirements of BS EN81-73, and based upon an International 'NO ENTRY' sign shall be provided on each lift landing in a position in which this is easily visible. An addition sign stating 'Do not use lift in the event of fire' shall be installed in conjunction with the prohibition sign. When the recall device is operated all of the lift safety devices shall remain operational, and all of the lift landing and lift car controls (excepting for the door open and emergency alarm push buttons) shall be rendered inoperative. All existing calls in the system shall be cancelled.

A visual signal located in the lift car operating panel shall be illuminated, and shall remain illuminated until the lift is returned to normal operation.

If at the time the recall device is activated the lift is on inspection control, under emergency electrical operation and/or under any other maintenance control, audible and visual indicators installed in the lift motor room, at each lift machinery space, on the lift car top, and in the lift pit shall automatically activate and shall remain activated

until the lift is returned to normal control whereupon the lift shall immediately revert to fire recall operation, and the audible and visual signal shall cease.

All audible signals shall be designed and constructed to provide a sound level which is adjustable between 35 d(B) A and 65 d(B) A and shall be set at 55 d(B) A. The sound produced shall be such that this differs from other signals used on the installation in order to enable maintenance staff to easily identify the condition.

7.5 *LIFT CAR FRAME AND ENCLOSURE VANDAL RESISTANT*

7.5.1 *Car Frame*

The Lift Contractor's attention is drawn to the fact that the lift car and lift car entrance are subject to a level of abuse including ingress of water and urine to the lift car and entrance equipment. The equipment design is to be suitable to accommodate this abuse. All materials used in the construction of the lift car platform and floor and entrances are to be suitably protected from the development and effects of corrosion. The Lift Contractor shall provide full details of the proposed protection with his Tender.

The car frame shall be designed, constructed and installed in accordance with the requirements of BS EN81-20 AND the requirements of s.5.4 and s.5.7 of BS EN81-71:2005 in relation to a Category 1 Lift.

The car enclosure shall be carried within a steel frame which is of substantial construction, formed with angle and channel sections which are suitably braced and stiffened. The lift car frame shall be designed and constructed such as to sustain a fully loaded car plus 25% overload, together with the dynamic loads and forces arising during use, during loading, and during safety gear and buffer operation, without permanent deformation. In the case of Goods Passenger Lifts, or Mobility Scooter use the calculation of the rated load shall be increased such that the design and construction of the lift car frame and platform shall be such as accommodate the additional loads and forces imposed by the handling devices and/or Mobility Scooters.

The lift car enclosure shall suitably isolated from the lift car frame by way oil resistant isolation rubbers which are of suitable resistance and density.

During the operation of safety devices the lift car floor shall not incline in excess of 5% from its normal position under the full load range of the lift car.

The lift car shall incorporate a substantial platform constructed as a framework of rolled steel sections bolted together and supporting a floor constructed from a suitably corrosion protected sheet steel floor panel which is adequately braced and supported such as to prevent flexure at 125% rated load. All surfaces of the platform steel construction and floor shall be suitably protected in a proprietary corrosion resistant coating.

All exposed metal work shall be painted with machine paint, in a colour to the approval of the Engineer, and as detailed in this Specification.

On the underside of the lift car provision shall be include for statically balancing the lift car. The design and construction of the static balancing system shall ensure that the complete lift car and its attachments can be statically balanced without exceeding the design parameters relating to the overall weight of the complete lift car and sling assembly and the lift safety equipment.

A toe guard, designed and constructed in accordance with the requirements of Section 5.4.5 of BS EN81-20, and manufactured in not less than 16 SWG steel, shall be installed beneath the lift car sill complete with adequate bracing to the lift car platform steelwork. The toe guard and bracing shall be painted as detailed within this Specification.

A data plate shall be fitted to the cross head of the lift car frame which shall provide details of the suspension rope type, construction, diameter and length along with weight of the lift car and the contract speed all expressed in SI Units.

The design of the lift car frame, platform, enclosure and entrances, including sills and mountings, shall be such as to accommodate the loads imposed during loading and unloading of the lift car and shall be designed based upon a minimum loading of:

In the case of Goods Passenger Lifts 60% of lift car rated load

7.5.2 *Car Enclosure (Vandal Resistant)*

The car enclosure shall be constructed in 16 SWG patterned stainless steel sheet. Each panel shall be flanged and bolted to give an enclosure which is of rigid and robust construction which is design and constructed in accordance with the requirements of BS EN81-20 AND the requirements of s.5.4 and s.5.7 of BS EN81-71:2005 in relation to a Category 1 Lift.

The exterior of the panels shall be treated with anti-drumming compound and noise absorption pads are to be fitted between the car frame and enclosure. All exposed metal work to the exterior of the enclosure is to be treated with machine paint, in a colour to approval of the Engineer.

The design and construction of the car enclosure shall be such that this is of mechanical strength which is at least equal to that of the landing doors and such as to ensure that each wall of the lift car shall resist, without permanent deformation in excess of 1 mm, a force of 1000 N evenly distributed over an area of 100 cm^2 in round or square section and applied at right angles at any point from within the lift car.

In the case of a Category 2 lift the design, construction and installation of any handrail shall be such as to support a force of 2500 N applied in any direction at the most unfavourable point.

The design and construction of the car roof shall be such as to have sufficient strength to safely support the maximum number of persons for who refuge spaces are provided under Section c.5.2.5.7.1 on BS EN81-20. And, the design and construction of the car roof shall be such as to ensure that this shall resist, without permanent deformation, a force of 2000 N applied at any position on an area of 0.3 m x 0.3 m.

Any trap or emergency door fitted in the lift car ceiling shall be design and constructed in accordance with the requirements of BS EN81-20 and with those of c.5.4.2 of BS EN81-71 including a security device the reset of which shall require intervention at the lift machinery space, control cabinet or emergency and inspection panel.

The external perimeter of the lift car roof shall be equipped with a toe board which shall be of minimum height 100 mm.

The surface of the car roof shall be of non-slip design and construction.

The lift contractor shall mark upon the car roof, using an indelible material, the locations of the refuge spaces and the extent of these as per signage stated elsewhere in this specification.

All materials used in the design and construction of the lift car enclosure and roof shall be non-flammable.

Materials applied for the car interior décor shall be designed and manufactured in accordance with the requirements of BS EN13501-1 as follows:

Car Flooring – Cfl-s2 for Category 1 Lifts and A2fl for Category 2 Lifts.

Car ceiling and walls – C-s2, d1 for Category 1 Lifts and A2 for Category 2 Lifts.

The design of the lift car ceiling for Category 1 Lifts shall be in accordance with the requirements of c.5.4.1.2 of BS EN81-71, and for Category 2 Lifts in accordance with the requirements of c.5.4.1.3 of BS EN81-71.

The design of the lift car lighting for Category 1 and 2 Lifts shall be in accordance with the requirements of c.5.4.4 of BS EN81-71, and shall provide a minimum level of illumination of 100 lux at floor level and at the control devices. The light fixtures shall be low energy LED which are flush fitting without visible fixings and designed such as to prevent unauthorized access. The light fittings shall resist, without material failure or loss of function, the tests set out at Annexes B and F of BS EN81-71.

Mirrors or glass materials shall be designed, constructed and installed such as to comply with the requirements of Mode B or C of BS EN12600, and Annex C should the material become broken. In the case of a Category 2 lift any mirror shall be flush fitted and of laminated material.

The Lift Contractor shall submit a constructional drawing of the car bodywork for inspection and comment before proceeding with manufacture.

To ensure that vibration is not transmitted to the car enclosure, a minimum clearance of 3 mm shall be maintained between the car enclosure and the steelwork of the sling.

7.5.3 *Electrical Equipment*

All lift car equipment, including equipment on the roof and outer walls of the lift car, and landing door electrical equipment, together with all equipment installed within the lift shaft which is located within 1 M of a wall which incorporates a lift landing entrance, shall be shrouded such as to provide protection from dripping and spraying water to a rating of IPX3 in accordance with BS EN60529.

The external roof of the lift car shall be designed such that the accumulation of water is prevented and such that controlled drainage is facilitated.

The shrouds shall be of robust design and construction and shall be suitably resilient such as to last for the Service Life of the Lift. Shrouds and/or enclosures/protection which are based upon polymer or plastic film or sheet will not be accepted.

All electrical lift components shall be designed and constructed to operate correctly in an ambient temperature range of 0° to 40°.

When under fire-fighting control the lift shall operate correctly regardless as to smoke ingress to the lift wells or machinery spaces.

7.5.4 Car Top Balustrade

In all cases in which the distance between the outer edge of the lift car roof and the wall of the lift well, measured horizontally and perpendicular to the lift car roof, exceeds 0.3 m the Lift Contractor shall supply and install a balustrade in accordance with the requirements of BS EN 81-20.

The design and construction of the balustrade shall include; a handrail; an intermediate bar positioned at half the height of the balustrade, and; a toe board, of minimum height 0.1 m, fitted around the external perimeter of the lift car roof.

The height of the balustrade, in its fully extended position, shall be not less than 1.1 m and the balustrade shall be located at a maximum distance of 0.15 m from the edges of the car roof. The distance between the outer edge of the handrail and any component of the lift or part of the lift well shall in no case be less than 0.1 m.

The design of the balustrade shall be such that this shall resist, without elastic deformation in excess of 50 mm, the application of a force of 1000 N applied horizontally and at right angles at any point at the top of the balustrade.

In cases in which the available headroom clearance is insufficient to accommodate a barrier of 1.1 m in height a suitably designed extendable barrier, which is designed and constructed in accordance with the requirements of BS EN81-20, and which has been approved by the Lift Contractor's Notified Body, may be applied. Such designs shall incorporate electrical interlock safety switches, which are designed and constructed in accordance with Section 5.11.2 of BS EN81-20, and configured such that the lift cannot be operated on 'Normal' operation whilst the barrier is extended, and such that the extension of the barrier is necessary in order to enable the lift car top inspection control operation.

A suitable warning notice shall be provided on each rail in order to warn of the danger of leaning over the rail.

The rail shall be manufactured in galvanised steel and suitably painted in a colour to the approval of the Engineer.

A sign shall be provided on the car top to advise on the allowable numbers of persons on the car top and the posture of the safe refuge space that is provided accordingly.

This shall be clearly displayed at the access point to the car top on the balustrade, readable from the landing, and also to the rear of the car.

7.5.5 Car Top Refuge Space

The area of the car top that the safe refuge is available shall be clearly defined by a green boarded refuge area which will define the refuge space per person.

7.5.6 Safety Gear

A robustly designed and constructed safety gear shall be fitted to the underside of the lift car. The safety gear shall be of the progressive type and operated by a suitably designed overspeed governor which is designed and constructed to match the characteristics of the safety gear. The safety gear shall be designed, constructed and installed such that this is capable of safely stopping and sustaining the descending lift car complete with rated load, by locking this to the guide rails. The safety gear shall operate at the tripping speed of the overspeed governor and in the case of a breakage of the suspension means.

The design of the safety gear shall be such that this will release automatically by movement of the lift car in the upwards direction of travel and shall reset such that the safety gear is immediately enabled for further operation. The design shall be such that the release may be affected under all load conditions up to and including rated load.

The design, construction and installation of the safety gear, together with its associated components, shall be in accordance with the requirements of BS EN81-20. Electrical devices associated with the safety gear shall be designed and constructed in accordance with the requirements of Section 5.11.2 of BS EN81-20.

The safety gear shall be subject to Type Examination in accordance with the requirements of Section 5.3 of BS EN81-50, the Lifts Regulations 2016 and Directive 2014/33/EU, and a Type Examination Certificate which is in accordance with the requirements of c.5.3.5 of BS EN81-50 shall be provided and a copy retained in the lift O&M Manual.

In all cases the average retardation of the lift car in the case of free fall shall be between 0.2 gn and 1.0 gn.

In cases in which a bi-directional safety gear is installed such as to prevent uncontrolled ascent or unintended movement of the lift car, this shall comply in all respects with the above requirements excepting that when actuated, the overspeed governor and safety gear shall be designed such that engagement of the ‘upwards’ direction elements of the governor and safety gear shall be released by movement of the lift car in the ‘downwards’ direction.

Safety gears incorporate adjustable speeds shall be marked with the range of speeds and the instructions shall be included in the lift O&M Manual.

7.5.7 Protection Against Unintended Lift Car Movement

The Lift Contractor shall supply and install a safety device which shall detect and prevent unintended movement of the lift car at a landing whilst the landing door is not in the locked position and the car door not in the closed position.

The device shall detect unintended movement of the lift car and shall by way of a suitably designed actuation system, cause the lift car to stop, and remain stopped, in accordance with the distance constraints set out at Section 5.6.7 of BS EN81-20.

The design, construction and installation of the safety device, together with its associated components, shall be in accordance with the requirements of BS EN81-20. Electrical devices associated with the safety device shall be designed and constructed in accordance with the requirements of Section 5.11.2 of BS EN81-20.

In the case that the lift machine brake is used as a means of preventing/stopping unintended movement this shall be designed and constructed in accordance with the requirements of Section 5.9.2.2.2. of BS EN81-20. The brake shall incorporate self-monitoring of correct lifting and dropping of the braking mechanism and verification of the braking force. The self-monitoring function shall be subject to Type Examination in accordance with the requirements of Section 5.8 of BS EN81-50, the Lifts Regulations 2016 and Directive 2014/33/EU.

The unintended movement device shall incorporate, in the form of specific system design, a means of detection, a means of actuation and a stopping means. Suitable stopping means may include: additional safety gears on the lift car or counterweight; lift machine sheave brakes; rope brakes or an equivalent to the approval of the Engineer.

The combined system of detection, actuation and stopping means shall form an integrated system which shall be subject to Type Examination in accordance with the requirements of Section 5.8 of BS EN81-50, the Lifts Regulations 2016 and Directive 2014/33/EU. .

The Lift Contractor shall state the type of device and the means of detection, means of actuation and stopping means in Section 10 of this document.

7.5.8 Ascending Car Overspeed Protection

The Lift Contractor shall supply and install a safety device which shall detect, prevent and stop uncontrolled ascent of the lift car.

The device shall be operational during normal lift operation and during manual rescue operations.

The design, construction and installation of the safety device, together with its associated components, shall be in accordance with the requirements of BS EN81-20. Electrical devices associated with the safety device shall be designed and constructed in accordance with the requirements of Section 5.11.2 of BS EN81-20.

The device shall detect uncontrolled ascent of the lift car and shall by way of a suitably means, cause the lift car to stop, and remain stopped, in accordance with the requirements set out at Section 5.6.6 of BS EN81-20.

In the case that the lift machine-brake is used as a means of preventing/stopping uncontrolled ascent of the lift car this shall be designed and constructed in accordance with the requirements of Section 5.9.2.2.2. of BS EN81-20. The brake shall incorporate self-monitoring of correct lifting and dropping of the braking mechanism and verification of the braking force. The self-monitoring function shall be subject to Type Examination in accordance with the requirements of Section 5.8 of BS EN81-50, the Lifts Regulations 2016 and Directive 2014/33/EU.

The uncontrolled ascent protection device shall incorporate, in the form of specific system design, a means of detection, a means of actuation and a stopping means. Suitable stopping means may include: additional safety gears on the lift car or counterweight; lift machine sheave brakes; rope brakes or an equivalent to the approval of the Engineer. During operation of the device the retardation of the empty lift car shall not exceed 1 gn

The combined system of detection, actuation and stopping means shall form an integrated system which shall be subject to Type Examination in accordance with the requirements of Section 5.7 of BS EN81-50, the Lifts Regulations 2016 and Directive 2014/33/EU. .

The Lift Contractor shall state the type of device and the means detection, means of actuation and stopping means in Section 10 of this document.

7.5.9 Suspension Ropes

The requirements regarding suspension are as follows:-

a) In the case of traction lifts at least four suspension ropes shall be used. Their nominal diameter shall not be less than 8 mm with a minimum safety factor of 12:1 and which shall be calculated in accordance with the requirements of BS EN81-50: 2014 and calculated based upon the worst case scenario.

b) The characteristics and tensile strength of the wire ropes shall be in accordance with the requirements of BS EN12385-5.

c) Each of the ropes shall be independently attached at its termination. Terminations shall be designed and constructed in accordance with the requirements of BS EN 81-20: 2014 and shall be fitted with a means of equalization and an isolated car hitch by means of springs or other method to the approval of the Engineer. The roping arrangement shall be 2:1

d) Acceptable means of termination include self-tightening wedge type sockets in accordance with the requirements of BS EN13411-6 or BS EN13411-7; ferrule secured eyes in accordance with the requirements of BS EN13411-3; or swage terminal in accordance with the requirements of BS EN13411-8. In all cases the design and construction of the rope termination shall be such as to achieve not less than 80% of the minimum breaking load of the rope.

e) During the servicing of the lift it shall be possible, by means of adjustment of nuts on the rope terminations, to shorten the ropes by 150 mm or more. The design shall be such that the termination shall not work loose following installation or adjustment

f) Following installation an anti-twist rope (3 mm) shall be fitted through the rope terminations in order prevent rotation.

g) A data plate shall be fixed to the lift car cross head giving the details of the suspension ropes type, construction, diameter, length and lift car weight, all expressed in SI Units.

h) Ropes and their terminations shall be installed in full compliance with the manufacturer's data and instructions, a copy of which shall be made available at the request of the Engineer, and which shall be included in the Operation & Maintenance Manuals.

Alternative means of suspension will be considered only on the basis that the design has been formally approved by a Notified Body, and in accordance with EU Lifts Directive 2014/33/EU and the requirements of BS EN81-20 and BS EN81-50, and strictly on the basis that the Lift Contractor has provided full details of the proposed design at the time of Tender.

7.5.10 Load Weighing Devices

The car sling or platform shall incorporate an automatic load-weighing feature. The device shall be operated when the lift car is overloaded such that lift operation is prevented whenever the load in the lift car reaches or exceeds 110% of the rated load.

When operated the device shall prevent normal starting of the lift car, including re-levelling and prevent the closing of the lift doors. In the case of manually operated doors or gates these shall remain unlocked. The device, when operated, shall cancel any preliminary lift starting functions.

When operated the device shall cause an audible and visible warning signal, which shall be located within the lift car interior, and fitted in the car station, to be activated to indicate the 'overload' condition.

The specified speech synthesis unit shall also include an announcement of "car over loaded, please reduce the load".

The design shall be such as to include a means of self-checking and the device shall 'fail to safe' such that it is not possible for an overloaded lift to operate.

The load-weighing feature shall also detect when the car is loaded to 80% load and will cause the lift to by-pass other landing calls in the current direction of travel. The final load figures shall be agreed with the Engineer during the Commissioning Tests.

The 'overload' and 'load weighing' switches may be fixed to the underside or top of the car sling but if mounted on the top, these shall be provided with suitable protection against damage.

7.5.11 Guide Shoes

The lift car and counterweight shall be fitted with self-adjusting robust guide shoes which incorporate renewable liners. Each of the shoes on the top of the lift car and counterweight shall be provided with an oil reservoir which incorporates wick lubricators complete with a means of adjusting the flow of lubricant to the guide rails.

In cases where sliding guide shoes with oil lubrication are employed a readily serviceable metal drip tray shall be provided at the base of each guide rail.

7.5.12 Mechanics Control Station

A Mechanic's Control Station, which is in compliance with the requirements of Section 5.12.1.5 of BS EN81-20, and the requirements of BS7255, shall be installed on the lift car top.

The design of the Mechanic's Control Station shall be in accordance with the requirements of c.5.12.1.5.2.4 of BS NE81-20.

The Mechanic's Control Station shall incorporate an 'Inspection Control Switch' which is designed in accordance with the requirements of Section 5.11.2 of BS EN81-20. The Inspection Control Switch shall be of bi-stable design and shall be suitably protected against involuntary or accident operation. The inspection control switch

Switches which are of rotary design shall incorporate a mechanical means (non-friction) of preventing the rotation of the stationary element.

In addition the Mechanic's Control Station shall incorporate direction push buttons, designated 'UP' and 'DOWN' and a push button designated 'RUN'. These push buttons shall be suitably protected against involuntary or accidental operation.

The design and construction of these push buttons shall be such that these operate in a constant pressure mode. Movement of the lift car shall be possible only by way of simultaneous constant depression of the 'RUN' button and one of the 'UP' or' 'DOWN' directional buttons. The design of the push buttons shall be in accordance with the requirements of c.5.12.1.5.2.3 of BS EN81-20, and these shall be configured such that operation of the 'RUN' and 'UP' or 'DOWN' buttons may be performed simultaneously by a person using only one hand.

The Mechanic's Control Station shall incorporate a stopping device which is designed and constructed in accordance with the requirements of c.5.12.1.11 of BS EN81-20.

The Mechanic's Control Station shall be design with a minimum level of protection of IPXXD in accordance with BS EN60529.

The Inspection Control Switch, when switched to the 'INSPECTION'' mode of operation, shall:

- Neutralise the normal controls of the lift;
- Neutralise the lift emergency electrical operation function;
- Disable the levelling and re-levelling functions;
- Prevent automatic operation of the lift door equipment; and
- Permit power operated closing of the lift doors by way of the operation of one of the direction push buttons of the Mechanic's Control Station; or additional switches, incorporated into the Mechanic's Control Station, and suitably protected against involuntary or accident operation, which control the operation of the doors.
- Prevent the lift car from overrunning the normal stopping positions.
- Maintain all lift safety devices in a functional and operational condition.

When in use the Mechanic's Control Station shall limit the speed of the lift car to a maximum of 0.63 m/sec and, to 0.3 m/sec whenever the vertical distance above any standing area on the lift car top is 2.0 m or less.

In cases in which more than one Mechanic's Control Station is provided (lift pit or machinery space, etc) and when more than one of these is switched to 'INSPECTION' mode, movement of the lift car shall be possible only by the simultaneous operation of the same control function switches of each Mechanic's Control Station.

The Mechanic's Control Station shall be located such that this is readily operable from within of horizontal distance of 0.3 m of a refuge space.

A stopping device, which is designed and constructed in accordance with the requirements of c.5.12.1.11 of BS EN81-20, shall be located in a readily accessible position and not more than 1.0 M from the entry point to the lift car top. This device may be that incorporated in the Mechanic's Control Station if this is located with 1.0 m of the car top entry point, or may be a separate device.

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Incorporated into the Mechanic's Control Station shall be a switched 13 amp three pin socket outlet with integral RCD operated at 30mA. A minimum 100 watt inspection lamp fitted with a protective guard shall be mounted on the Station and controlled by a switch fitted adjacent to it.

The inspection lamp, or an additional emergency light unit complete with protective guard, shall be provided with emergency backup by means of a battery and charger, giving a minimum 3 hours duration and maximum 12 hours recharge. The light shall provide a minimum light intensity of 5 lux for a minimum period of 1-hour, measured at the engineer alarm initiation device and at a point 1 M above the floor of the car roof at the centre of the car roof.

A lift car top communication system, designed and constructed in accordance with the requirements of BS EN81-20 and BS EN81-28, shall be incorporated into, or mounted adjacent to the Station, together with clear instructions as to its use.

7.6 Mechanics Control Station – Lift well

A permanently installed Mechanic's Control Station, which is in compliance with the requirements of Section 5.12.1.5 of BS EN81-20, and the requirements of BS7255, shall be installed in the lift well pit.

The design of the Mechanic's Control Station shall be in accordance with the requirements of c.5.12.1.5.2.4 of BS EN 81-20.

The Mechanic's Control Station shall incorporate an 'Inspection Control Switch' which is designed in accordance with the requirements of Section 5.11.2 of BS EN81-20. The Inspection Control Switch shall be of bi-stable design and shall be suitably protected against involuntary or accident operation. The inspection control switch

Switches which are of rotary design shall incorporate a mechanical means (non-friction) of preventing the rotation of the stationary element.

In addition the Mechanic's Control Station shall incorporate direction push buttons, designated 'UP' and 'DOWN' and a push button designated 'RUN'. These push buttons shall be suitably protected against involuntary or accidently operation.

The design and construction of these push buttons shall be such that these operate in a constant pressure mode. Movement of the lift car shall be possible only by way of simultaneous constant depression of the 'RUN' button and one of the 'UP' or' 'DOWN' directional buttons. The design of the push buttons shall be in accordance with the requirements of c.5.12.1.5.2.3 of BS EN81-20, and these shall be configured such that operation of the 'RUN' and 'UP' or 'DOWN' buttons may be performed simultaneously by a person using only one hand.

The Mechanic's Control Station shall incorporate a stopping device which is designed and constructed in accordance with the requirements of c.5.12.1.11 of BS EN81-20.

The Mechanic's Control Station shall be design with a minimum level of protection of IPXXD in accordance with BS EN60529.

The Inspection Control Switch, when switched to the 'INSPECTION'' mode of operation, shall:

- Neutralise the normal controls of the lift;
- Neutralise the lift emergency electrical operation function;
- Disable the levelling and re-levelling functions;

- Prevent automatic operation of the lift door equipment; and

- Permit power operated closing of the lift doors by way of the operation of one of the direction push buttons of the Mechanic's Control Station; or additional switches, incorporated into the Mechanic's Control Station, and suitably protected against involuntary or accident operation, which control the operation of the doors.

- Prevent the lift car from overrunning the normal stopping positions.

- Maintain all lift safety devices in a functional and operational condition.

When in use the Mechanic's Control Station shall limit the speed of the lift car to a maximum of 0.63 m/sec and, to 0.3 m/sec whenever the vertical distance above any standing area in the lift well pit is 2.0 m or less.

In cases in which more than one Mechanic's Control Station is provided (lift car top or machinery space, etc) and when more than one of these is switched to 'INSPECTION' mode, movement of the lift car shall be possible only by the simultaneous operation of the same control function switches of each of the Mechanic's Control Stations.

The Mechanic's Control Station shall be located such that this is readily operable from within of horizontal distance of 0.3 m of a refuge space.

A stopping device, which is designed and constructed in accordance with the requirements of c.5.12.1.11 of BS EN81-20, shall be incorporated into the Mechanic's Control Station.

An electrical reset switch shall be provided and shall be configured such that this is operated from outside of the lift well, either by operation in conjunction with the emergency unlocking means provided to the door which gives access to the pit; or which located outside of the well and which is accessible to authorised persons only.

The return of the lift to Normal operation shall only occur when:

- The landing doors providing access to the pit are closed and locked;

- All of the stopping devices in the pit are set to their 'Run or 'Normal' mode;

- When an electrical reset switch located outside of the lift well, is operated.

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A lift well pit communication system, designed and constructed in accordance with the requirements of BS EN81-20 and BS EN81-28, shall be incorporated into, or mounted adjacent to the Station, together with clear instructions as to its use.

7.7 CAR SIGNAL AND OPERATING DEVICES

7.7.1 Operating Panel

In addition to the stated general requirements the design, construction and installation of the car operating devices shall meet with the requirements of s.5.5 of BS EN81-71:2005.

The lift car interior operating devices shall be incorporated within the sidewall of the lift car and integral with it, in a position which is in compliance with the requirements of Part M2 of the Building Regulations and those of BS EN 81-70. Faceplate designs will not be accepted.

A key operated independent service switch, a key operated fan switch and a key operated car interior light switch, door open push and alarm push buttons shall be provided in addition to the required lift floor call push buttons.

A visual indicator and audible buzzer shall be provided in order to signify 'car overloaded'. The alarm and door open push buttons shall be permanently illuminated including under emergency lighting operation. The alarm and door open push buttons, which shall be the lowest of the push buttons in the lift car, shall be positioned at a height not less than 900 mm above the car floor. The operating pushes shall be positioned at a height of between 900 mm and 1200 mm above the lift car floor in order to aid accessibility.

The design of the push buttons shall be such as to meet the requirements of BS EN 81-70, and shall be in a single or double column arrangement and of the 'micro' movement type. The key switches, door open button and alarm button and the overload indicator shall all be of the same design and manufacture as the push buttons. Each push button shall be arranged to illuminate to indicate call acceptance and the method of illumination shall be by light emitting diodes (LED).

The pushes shall be tonal contrast to the panel and the panel to the surrounding wall.

An LED call registered illuminated signal shall be incorporated within the halo symbol of each push and each push button shall incorporate an audible signal to confirm operation.

The Exit floor push shall protrude 5 mm beyond the other floors and be coloured green, with green illumination.

The Alarm button system shall be provided with an additional yellow illuminated pictogram to indicate the alarm has been given, and a green illuminated pictogram to indicate that the alarm has been registered.

The key operated independent service switch shall, when switched to 'Independent Service', isolate the lift car from all landing calls. The lift car shall respond to only to car interior calls, and on a single call basis only, and shall park with the doors open.

The key operated car interior light switch shall be suitably shrouded and incorporate a test position for the lift car emergency lighting.

A full colour 7" digital car position indicator shall be provided within each operating panel between 1600 mm and 1800 mm from the car floor. The visible part of the floor numbers shall be between 30 mm and 60 mm..

All of the equipment shall be designed, constructed and installed in accordance with the requirements of BS EN81-20 and BS EN81-70.

The car-operating panel shall incorporate the lift manufacturer's name, the lift serial number, the CE Mark and the reference number of the Notified Body.

7.7.2 Emergency Signal

An audible alarm signal shall be fixed in an approved position within 5 metres of the lift shaft or within the lift shaft. A secondary alarm signal shall be provided on the roof of the lift car. They shall give a minimum audible level of 90 dBA at 1 metre outside the shaft area.

The supply shall be obtained from an auto-recharge unit of approved make fitted with nickel cadmium batteries. Minimum duration 3 hours maximum recharge time 12 hours.

The Lift Contractor shall supply and fix the auto-recharge unit either in the lift machine room/machinery area or on the lift car roof.

The signal will be actuated by the 'alarm' push in the lift car station. A pair of volt-free contact terminals is to be incorporated for the emergency telephone function.

7.7.3 Emergency Auto Dialling (MEMCOM)

An auto-dialling emergency communications system which is designed, constructed and installed in accordance with the requirements of BS EN81-20, BS EN81-28 and the Lifts Regulations 2016 shall be provided in each lift car and electrically connected to the machine room/machinery space. The system shall include as a minimum:-

a) A speaker unit shall be suitably mounted and concealed behind the lift car front panel. The unit shall be fitted with an integral steel baffle plate for protection against vandalism and a volume control which shall not be accessible from within the lift car.

b) A call/speaker unit mounted on the car top and in the pit.

c) A main power pack and control unit mounted on the lift car roof and connected to the speaker by communications grade cabling.

d) The auto-dialler shall be activated by the operation of the 'alarm' push and will then automatically dial the first of a sequence of pre-programmed telephone numbers. When the operator answers, the system will allow two-way 'hands-free' conversation and a pr- programmed voice message shall identify the lift number and its precise location. e.g. 'Lift alarm activated on passenger lift 3 at TUV SUD House, Newcastle NE1 3DY, please press star to acknowledge this call.' This voice prompt shall continue at pre-set intervals until acknowledgement has been given. Two-way communication shall be possible throughout this period. If the call has not been acknowledged within an adjustable period of 30 seconds, the call will terminate and move onto the next number in the sequence. Similarly, failure to connect with the first number will initiate dialling to the second pre-programmed number. This cycle of automatic dialling shall continue to all programmed numbers until acknowledgement of the call has been registered. When the call has been acknowledged then an adjustable call duration of 2 minutes will be allowed. This period may be extended or the call terminated by following the advice of voice prompt messages.

e) The following features will be incorporated:-

220-240 volt mains supply
8 hours battery back-up
3 programmable numbers to 10 digits
programming by portable programmer
3 second response delay

2 minutes time out per conversation
System generated self-test of auto-dialler, at least once every 3 days
BT approval
Voice enunciation of instruction, to minimise engraving

f) Provide an acoustic coupler or, when a remote proximity device is installed, an inductive loop system with sufficient field strength to be suitable for its purpose, along with suitable indication of its availability for hearing aid users.

g) A green illuminated pictogram to indicate the call/alarm has been registered.

h) Adjustable volume to ensure a sound level of between 35 and 65 dBA.

The Lift Contractor shall include for all costs of reprogramming the auto-dialler system and/or changing the telephone numbers in order to suit the Purchaser's requirements, in the case that the Lift Contractor is not awarded the Maintenance Contract upon completion of the Defects Liability Period, or at any subsequent time.

7.7.4 Voice Synthesiser

The voice synthesiser shall be of the digital type capable of on-site programming and shall include, as a minimum, for the transmission of the following messages.

- Arrival at the floor and its designation.
- Preparing to depart.
- Doors about to close.
- Remove obstruction from the doors.
- Lift failed to start, please press door open push.
- Lift overloaded. Please Reduce the Load

The synthesiser shall have an additional facility for incorporating and processing a further 10 separate phrases.

Final detail in respect of the voice type and the wording of the individual messages to be transmitted shall be subject to the Engineer's approval.

The voice synthesiser shall have an inductive loop system with sufficient field strength to be suitable for its purpose, along with suitable indication of its availability for hearing aid users.

The sound level shall, as a minimum, be adjustable between 35 dB(A) and 65 dB(A), and with a facility to increase the sound level such as to meet site conditions. The final sound level shall be to the approval of the Engineer.

7.7.5 Audio Induction Loop System

The Contractor shall provide an audio induction loop system in the car to assist the hard of hearing.

This shall be designed, constructed and installed in accordance with the requirements of BS 7594 and BS EN 60118-4: 2015 and shall be capable of providing a minimum magnetic field strength, over a covered area, of 100 mA RMS per metre.

Induction loop system signage shall be provided on the car control station below the car load plate on the car operating panel. This shall be an engraved sign with blue infill. Stickers shall not be accepted.

The outputs of the speech synthesis unit and the emergency auto-dialler shall be linked into the loop system amplifier, via transformer isolated inputs, which shall provide a corresponding electric current in the loop, proportional to the source input signal. The electric current in the induction loop will produce a magnetic field which can be detected by hearing aid users with their hearing aids set on the 'T' or 'MT' settings.

The induction loop circuit shall also generate sufficient magnetic field strength at a height of not more than 1200 mm above floor level of the lift car, to ensure wheelchair users have equal benefit from the loop system, with minimal electrical interference.

The frequency response shall cover the range 80Hz to 5kHz ± 1.5dB relative to 1kHz at low level, measured as loop current with no metal loss correction.

The induction loop cable shall be run around the perimeter of the lift car ceiling in a concealed location, with non-metallic containment, providing 300 mm separation from electrical switching equipment on the car e.g. door operator, which may provide interference to the magnetic field.

In circumstances where the loop can only be installed above the car roof, the system shall include a 'Metal loss correction' adjustment to compensate for the reduction in field penetration.

The induction loop field strength shall be tested as part of the commissioning procedures of the lift and demonstrated to the engineer using a calibrated Magnetic Field Strength Meter and Loop Listening Device.

7.8 CAR & LANDING ENTRANCES

7.8.1 Automatic Power Operation of Car and Landing Doors Vandal Resistant (without nudging)

The automatic door operator shall provide quiet controlled motion of the car and landing doors throughout the full extent of the opening and closing cycles. A solid guard shall be fitted to the operator driving mechanism. The whole of the operator and its associated devices shall be mounted on steel members forming part of the car sling and under no circumstances shall the operator be fitted directly to the car enclosure.

The lift car and landing entrances shall meet with the requirements of, and tests specified in, s.5.3 of BS EN81-71:2005 together with those of BS EN81-71 in relation to a Category 1 Lift.

The lift car and landing entrance doors shall be equipped with devices which ensure that the door panels are retained in position in the event of failure of a guiding element. The door panels and retain devices shall be tested in accordance with the requirements of c.5.3.5.3.4 of BS EN81-20: 2014 and of Section 5.14 of BS EN81-50: 2014 and of c.5.3.1.2 and c.5.3.1.3 of BS EN81-71. The Lift Contractor shall provide a Test Report in accordance with c.5.14.5 of BS EN 81-50: 2014.

The following requirements shall also be maintained:-

a) It shall be driven by an electric motor in both opening and closing directions and tested for compliance with BS EN81-20 in relation to closing force and for kinetic energy by using an approved device. Any reduction gearbox shall utilise steel/bronze gearwheels. Nylon/plastic gears will not be acceptable.

b) Provision shall be made for the site adjustment of the opening and closing cycles of the car and landing doors and these adjustments shall be independent from each other.

c) In the case of glass panel construction lift car and/or landing doors a device which limits the door opening force to 150 N and which stops the door in the opening cycle in the event of an obstruction shall be provided.

d) Car doors shall only operate on normal service while the car is in the levelling zone of a particular floor.

e) A “door open” button shall be provided in the car and it shall be operative only while the car is stationary with the car door coupled to a landing door. The lift shall “normally” park with the doors closed.

f) The design of the door operator shall be such that the prevention of the door closing movement shall initiate an automatic re-opening of the door.

g) Couplers shall be of the metal type of robust construction, being of the same manufacture as the door operator and landing locks.

h) The design and construction of the door operator and associated equipment shall be such that when the lift car is stopped within the unlocking zone it shall be possible, applying a force not exceeding 300 N, to open the lift car and landing door by hand from the interior of the lift car, and from the landing once the landing door has been unlocked, either by the car door or by way of the landing locking device release key.

i) The design and construction of the door operator and associated equipment shall be such that when the lift car is stopped within 1.2 m of a landing it shall be possible to open the lift car doors from the corresponding landing without the need for tools, other than for the landing locking device release key and/or a specific tool which is permanently retained with the lift installation.

j) Car doors shall be fitted with a device to ensure that they remain closed and interlocked when the lift is outside the levelling zone. The device shall be designed and constructed in accordance with the requirements of Clause 5.3.9.2 of BS EN81-20: 2014 and shall be subject to Type Examination in accordance with the requirements of Section 5.2 of BS EN81-50: 2014 and the Lift Contractor shall provide a Type Examination Certificate which is in accordance with Annexe A of BS EN81-50: 2014.

7.8.2 Car and Landing Doors Vandal Resistant (Fire Rated)

The lift landing entrances and doors and frames shall be 2-hour Fire Rated and subject to Fire Resistance Test in accordance with the requirements of BS EN81-58. The Lift Contractor shall issue a Test Report and a Declaration of Performance in accordance with the requirements of BS EN81-58.

Door panels shall be of double skin construction and the sheet steel shall be a minimum of 16 swg such as to assure the continuing integrity of these for the life of the lift installation and the prevailing site conditions. The face of the door panels shall maintain a fixed running clearance in relation to the architrave or door entrance surround and provision for adjusting this dimension shall be provided. All fixings and attachments of each individual door panel shall be adequately reinforced to ensure that distortion of the door panel cannot occur. The design of the lift car and landing doors and entrances shall be in accordance with the requirements of BS EN81-71 in relation to a Category 1 Lift.

The design and mechanical strength of the lift car and landing entrance door panels and frames shall be such that these meet the requirements of Section 5.3.5.3 of BS EN81-20: 2014 AND those of Section 5.3 of BS EN81-71.

The lift car and landing entrance doors shall be equipped with devices which ensure that the door panels are retained in position in the event of failure of a guiding element. The door panels and retaining devices shall be tested in accordance with the requirements of c.5.3.5.3.4 of BS EN81-20: 2014 and of Section 5.14 of BS EN81-50: 2014 and of c.5.3.1.2 and c.5.3.1.3 of BS EN81-71. The Lift Contractor shall provide a Test Report in accordance with c.5.14.5 of BS EN 81-50: 2014.

When the doors are in the closed position the clearances between door panels, between door panels and uprights and lintels and sills shall not exceed 6 mm, which shall be measured from the back of any recess.

The clear entrance of landing doors shall match that of the car doors and in no case shall the clear entrance width of the landing doors exceed that of the car doors by more than 50 mm at any side.

Each panel shall be located in its bottom track by means of two sliding shoes, each having an offset vertical flange secured to the well side of the door, so that the shoe can be easily replaced without lifting the panel. In addition a robust mechanical retaining shoe/bracket, formed in metal, shall be incorporated into the design of each door panel such that the panel shall be securely retained in the sill in the event that the door shoes should fail or of physical impact to the door panel.

Each door panel shall be suspended from the top track assembly by hangers fitted with at least two polyurethane rollers with anti-friction bearings and a steel restraint boss to prevent the suspension becoming dislodged from the track.

The landing doors shall be provided with mechanical spring closers for automatic closing of the doors when manually opened. At no time shall the springs operate in tension.

Each landing door panel to be fitted with a reinforced sight guard and the return edge shall be not less than 50 mm wide to mask the shaft side of the landing panel. The guard shall be finished to match the doors. No fixings to be visible on the exposed faces.

The non-driven door panels of each lift car and landing entrance shall be fitted with an electrical interlock, or alternatively, may be mechanically coupled in accordance with Sections 5.3.11 and 5.3.14 of BS EN81-20: 2014. Any air cord inter-connections shall be of steel construction.

The design of the lift car and landing entrances systems, including sills and mountings, shall be such as to accommodate the loads imposed during loading and unloading of the lift car and shall be designed based upon a minimum loading of:

In the case of Passenger Lifts 40% of lift car rated load;

In the case of Passenger Lifts which carry Class C wheelchairs and/or mobility scooters 60% of lift car rated load;

In the case of Goods Passenger Lifts 60% of lift car rated load.

7.8.3 Locking Devices and Switches for Car and Landing Entrances Vandal Resistant

The locking devices and switches for the car and landing entrances shall meet with the requirements of, and tests specified in, c.5.3 of BS EN81-71 such as to provide compliance in relation to a Category 1 Lift.

In the case of Category 2 Lifts the requirements of c.5.3.2 and c.5.3.6 in relation to the prevention of the manipulation of the lift door operator, car and landing locks and associated equipment shall apply.

The requirements of c.5.7 of BS EN81-71 shall apply in relation to both Category 1 and Category 2 Lifts.

The car door contacts, car and landing door locking devices and “pick-up” mechanism shall be of the same manufacture as the door operator and properly aligned for correct operation.

The landing and car doors shall be provided with electro-mechanical interlock devices, which shall prevent operation of the lift under any circumstances, unless all lift car and landing doors are in the closed position, and are locked both electrically and mechanically.

Provision shall be made for fully opening each landing door by an authorised person by the aid of a release key which shall be designed such as to fit an unlocking device which is incorporated into in one door panel. The release aperture on the visible face shall be fitted with a 3 mm raised circular stainless steel bezel secured in position, or by way of a fixed escutcheon plate with a profile aperture suitable for the specific type of release key. No fixing screws shall be visible from the landing.

The design of the release key shall be in accordance with Section 5.3.9.3 of BS EN 81-20: 2014, and shall be of steel section or cast materials and the access to each lock shall be restricted to this key. The force necessary to operate and release the door shall be such that unauthorised use of the release mechanism (by the use of screwdriver, pliers etc) will not be possible.

In order to enable safe egress from the lift pit the Lift Contractor shall provide an additional, permanently installed device, which allows a person standing on the base of the pit to safely unlock the pit access landing entrance door. The device shall be designed and constructed in accordance with Clause c.5.3.9.3.5 of BS EN81-20: 2014.

All locking devices shall be designed and constructed in accordance with the requirements of Section 5.3.9 of BS EN81-20 and in particular Clauses c.5.3.9.2, c.5.3.13 and c.5.3.14 (lift car door devices); and Clauses c.5.3.9.1, c.5.4.9.4 and c.5.3.11 (lift landing door devices), and shall be subject to Type Examination in accordance with the requirements of Section 5.2 of BS EN81-50: 2014. In addition the requirements of c.5.3.2 and c.5.3.6 of BS EN81-71 shall apply to Category 2 lifts.

Lift Contractor shall provide a Type Examination Certificate which is in accordance with Annexe A of BS EN81-50: 2014.

The lock circuit voltage shall be given in the Tender Particulars in Section 10 of this Specification. If this is designed to be in excess of 50v then suitable warning notices, in accordance with the relevant standards, shall be provided on each lock cover to warn of the hazard within. Additionally, a suitable residual current device (RCD) or similar earth leakage circuit breaker shall be incorporated in the lock control circuitry to minimise the risk of electrocution.

7.8.4 Door Detector (VR EN81-71)

The car door panels shall be fitted with an electronic device, which will provide a protective zone for the full width and height of the doors.

The door detector and its configuration and mounting and shall meet with the requirements of s.5.3.4 of BS EN81-71:2005.

The principle of operation shall be an infra-red curtain of light. The device shall remain operational throughout the complete closing cycle of the doors to within 20 mm of the door closed position. The device shall have the facility to detect persons and/or objects as these approach the entrance. The device shall be capable of detecting objects and/or obstacles of 50 mm in diameter. When the device is obstructed, it shall cause the doors to immediately stop and then fully re-open after which the doors will re-commence the normal closing cycle.

Whenever the device is deactivated and/or in failure mode the kinetic energy of the combined lift car and landing doors shall be reduced to 4J or less and a distinct acoustic warning signal shall operate whilst the doors are closing.

The device location shall be given in the Tender Particulars .

7.8.5 Landing Door Closers

The lift landing entrance doors shall be fitted with gravity weight closers which are designed and constructed such as to ensure self-closing of the doors when these are opened manually. The gravity weights shall be retained in fully enclosed retaining enclosures such that the weight when in travel is suitably secure and is guided such as to ensure silent operation.

7.8.6 Car & Landing Sills

The lift car and landing doorsills shall be designed and manufactured in the form of a heavy section aluminium extrusion. The sills shall be securely bolted on to RSA angles which shall be fixed to the front wall of the lift shaft with proprietary fixings. The number of fixings used shall be calculated to accommodate the maximum point loading which may be applied. Any packing between the aluminium and RSA sill or tread-plate shall be continuous and such that no voids shall exist on completion such that deflection of the sill cannot occur.

The design of the sills and mountings shall be such as to accommodate the loads imposed during loading and unloading of the lift car and shall be designed based upon a minimum loading of:

In the case of Passenger Lifts 40% of lift car rated load;

In the case of Passenger Lifts which carry Class C wheelchairs and/or mobility scooters 60% of lift car rated load;

In the case of Goods Passenger Lifts 60% of lift car rated load.

7.8.7 Landing Fascias Vandal Resistant

In addition to the stated general requirements of this Specification the design, construction and installation of the landing fascias shall meet with the requirements of BS EN81-20 together with the specific requirements of s.5.3, and the corrosion resistance specified in s.5.7, of BS EN81-71:2005.

Fascia panels manufactured from a minimum of 16 SWG zinc-coated mild sheet steel shall be fitted between the header of each entrance and the sill of the floor above.

The panels shall be rigidly braced and any fixings or brackets used for mounting or to achieve rigidity shall be of steel.

The design, construction and installation of the fascia shall such that this is capable of withstanding a force of 2500 N applied at right-angles to the fascia, and evenly distributed over an area of 100 cm2 in round or square section, and applied at any point on the fascia, without permanent deformation, and without elastic deformation in excess of 15 mm.

The surface of the fascia panels and their joints shall be continuous and hard and smooth throughout the height and width of the shaft.

Each fascia panel shall exceed the full width of the widest entrance by 200 mm on either side.

Only countersunk screws will be accepted such that the surface, at all points on each panel, is smooth and flush

Following installation the fascia shall be site painted with hand brushing cellulose colour to match all other site steelwork.

7.8.8 Architraves

Box section jamb entrance surround shall be fitted at all floors.

They shall be finished as per the schedules of finishes in this specification.

The design of the architrave shall be a rectangular header section which sits over the two jambs providing a single joint to the top each architrave leg.

The architraves shall be formed around a 14 swg Zintec finished steel former which shall be braced against distortion and include fixings to the landing entrance walls.

The architraves and lift landing entrances shall be provided with minimum a 2 hour fire rating and certification in accordance with the requirements of BS EN81-58.

All architraves shall be site measured before manufacture to suit the specific dimensions at a specific floor.

The returns of the architraves shall be set into the wall around the perimeter and then the perimeter sealed against moisture ingress.

The well side of the landing architraves shall have no gaps between the door frame and the architrave. All gaps shall be packed with rockwool where they are 50 mm or less, or lined in a double skin of fire line board for gaps greater than 50 mm. A Zintec steel fire trim shall be fitted between the outside of the door surround and the rear of the entrance wall on the well side to cover any packing.

7.9 Landing Signal and Operating Devices (Vandal Resistant)

In addition to the stated general requirements the design, construction and installation of the landing signal and operating devices shall meet with the requirements of s.5.5 of BS EN81-71:2005.

7.9.1 Landing Signal and Operating Devices

The landing signal and operating units shall comprise of robustly constructed steel or PVC back boxes, which are of rectangular form and let into appropriate cut out preparations in the landing structural walls. The unit shall contain the push units and have cover plates manufactured from 12 SWG stainless steel.

The cover plates shall be secured by semi-secret fixings such as recessed captive grub or socket headed screws. Visible screw heads will not be accepted. Cover plates shall provide an adequate overlap of the wall box and the method of securing shall allow for adequate adjustment in order to overcome any error in the positioning of the back boxes.

Landing controls will be arranged as a single riser with a push station located on the central structural pier between landing entrances at each floor.

Each landing push station shall be fitted with one or two push units to suit the requirements of the control system. The design and construction of the units shall be in accordance with the requirements of BS EN81-70. The units shall be positioned and arranged in accordance with the requirements of BS EN81-70. The visible section of each push shall incorporate a pressel, with a translucent halo and symbol, which are suitably finished to contrast in colour and tone with that of the cover plate. Each push pressel shall be arranged to illuminate to indicate call acceptance. The method of illumination shall be by light emitting diodes (LED).

Each push shall have an audible signal to confirm operation. The push stations shall be installed at a height which ensures a minimum dimension of 900 mm above Finished Floor Level to the centreline of any push and a maximum height of 1100 mm above Finished Floor Level the centreline of the highest push.

The push plate shall be in tonal contrast to the surrounding wall.

7.9.2 Tactile Symbols

All car and landing pushes shall incorporate tactile markings which are in accordance with the requirements of BS EN81-70 and on the pressel or adjacent to the push. The means of achieving tactile markings shall be to the Engineer's approval and full details are to be provided with the Tender.

The floor designation shall be a tonal contrast to the push pressel. The pressel shall be a tonal contrast to the plate.

Each push shall have an audible confirmation of operation.

Each landing push plate shall have a tactile indication of the floor level.

7.9.3 Tactile Jamb Plates

A cast aluminium tactile plate shall be fitted to the side jamb of each landing entrance, at right angles to the entrance and visible from within the car when stood at the car control station. The tactile plate will be mounted at a height of approx 1400 mm.

7.9.4 Landing Position Indicators

Landing signal devices shall be provided at each landing entrance and shall comprise of an alpha numeric display combined with an audible enunciator.

The display shall consist of a TFT screen, or other alternative device to the approval of the Engineer, installed behind a tinted polycarbonate mask providing a display of alpha/numeric characters of minimum 40 mm in height. The enunciator shall be of a soft tone gong or electronic sounder design and shall be contained within the unit. The enunciator shall provide different sounds for 'UP' and 'DOWN' directions of lift travel e.g. one sound up, two sounds down.

As the lift car moves in the lift well its position shall be indicated by the changing the alpha numeric display. As the lift car approaches a landing at which it is to stop in order to discharge or receive passengers, the tone shall sound in order to announce the imminent arrival of the lift car and the display shall switch to an arrow indicating the next direction of lift travel from the landing. This directional signal shall be maintained until the lift doors close and the lift car moves away from the landing.

The lift position indicators shall be supplied as individual units and shall be located between 1800 mm and 2500 mm from Finished Floor Level, and adjacent to their respective lift landing entrances and shall be provided complete with cover plates to match those of the landing push stations.

The indicators shall be located as per the schedules requirements in section 6 of this specification.

The indicator shall provide an angle of view of at least 140° from any position in the lift landing lobby.

The devices shall be design and constructed in accordance with the requirements of BS EN81-70.

7.10 LIFT SHAFT, COUNTERWEIGHT & PIT

7.10.1 Guides and Fixings

The Lift Contractor shall supply and install 'T' section machined steel guide rails complete with purpose-designed brackets, bolts and fixings, all designed, constructed and installed in accordance with the requirements of BS EN81-20 and BS EN81-50.

Both the lift car and counterweight sets of guide rails shall be plumbed and aligned with each other. And, 'tram lining' will not be allowed.

The guide rail system, inclusive of brackets and fixings, shall be designed to suit the configuration of the lift shaft and the loads imposed by the lift, lift equipment and the means of loading of the lift car, including motorised wheelchairs.

The design and installation of the guide rail brackets shall be such as to accommodate settling of the building structure and/or shrinkage of concrete. The design and installation of the fixings shall be such as to prevent rotation which could release or compromise the integrity of the system

The vertical pitch of fixings and size of guide rails shall be selected and designed such as to accommodate the maximum loading that may be imposed upon this at any time and without excessive deflection of the guide rails.

The guide rails, fixings and the pitch of fixings shall be designed such that the maximum deflection criteria detailed in BS EN81-20 is not exceeded. The necessary proof calculations, based upon the BS EN81-50 method, shall be made available at the Engineers request. The Lift Contractor shall include for the possible failure of any non-metallic elements of the guide rail fixings in the calculation of permissible deflection.

The design of the guide rails, brackets and fixings shall be such as to accommodate the loads imposed during loading and unloading of the lift car and shall be designed based upon a minimum loading of:

In the case of Passenger Lifts 40% of lift car rated load;

In the case of Passenger Lifts which carry Class C wheelchairs and/or mobility scooters 60% of lift car rated load;

In the case of Goods Passenger Lifts 60% of lift car rated load.

7.10.2 Counterweight and Screen

The Lift Contractor shall supply and install robustly constructed channel frame type of counterweight which shall be designed to securely house a number of multiple section filler weights commensurate with the design of the lift installation.

The filler weights shall be of either cast iron or flame cut mild steel construction.

The complete counterweight shall be balanced by the suspended weight of the lift car and its attachment together with 45% to 50% of the contract load of the lift car.

The Lift Contractor shall include provision for securely clamping the filler weights into position such that under no circumstances, including operation of the lift car or counterweight buffers, can the filler weights become dislodged from the counterweight frame. The whole counterweight assembly shall be site painted with safety yellow proprietary machine paint.

In cases in which extension sections are attached to the bottom of the counterweight in order to provide an allowance for adjustment of the run-by after normal stretching of the suspension ropes, these extension sections shall be fabricated from rolled steel sections, and shall be securely bolted to the underside of the counterweight and accurately aligned with the striking surface of the buffer(s).

The Lift Contractor shall supply and install, at the base of the counterweight guides, a counterweight screen rigidly constructed in expanded mesh in accordance with the requirements of c.4.2.4.1 of BS EN ISO 13857:2008.

The counterweight screen shall extend upwards from the lowest point of counterweight travel (including the stroke of the counterweight buffer), or a point not greater than 300 mm, whichever is the lower, to a minimum height of 2.0 m above the pit floor.

The counterweight screen shall extend for a minimum of the full width of the counterweight.

In the case that the horizontal distance between the counterweight guide rails and the wall of the lift well should exceed 300 mm the areas at the sides of the counterweight and counterweight guide rail shall be guarded using materials of the same design and specification as that of the counterweight screen.

In cases in which chain or rope compensation is applied that counterweight screen may be designed to accommodate slots which shall be of the minimum width necessary in order to safely accommodate the compensation.

The design and construction of the counterweight screen shall be such as to accommodate a force of 300 N evenly distributed over an area of 5 cm^2 in round or square section, applied at any point on the screen, without deflection such that the screen should come into contact with the counterweight.

The design of the counterweight screen shall be such that a minimum clearance of 50 mm is maintained at all times between the lift car and the counterweight and their associated components and the screen.

The bottom of the screen shall be designed to assure easy access to the buffers, and to permit checking of run-by clearances, but such as to prevent inadvertent contact between personnel and the counterweight.

7.10.3 Buffers

The Lift Contractor shall supply and install energy accumulation (spring or polypropylene) buffers below the lift car and below the counterweight.

The design, construction and installation of the buffers shall, in all respects, be in accordance with the requirements of BS EN81-20.

The Lift Contractor shall supply and install all necessary associated steelwork for the mounting and fixing of the buffers.

Concrete supporting piers will NOT be acceptable.

The buffer mounting steelwork shall be of robust construction securely fixed between the respective lift car and counterweight guide rails and be of sufficient height to maintain the over-travels of the lift car and counterweight and the clearances required under BS EN81-20.

The design of the buffers shall be such as to ensure that the rate of retardation applied in order to safely arrest the fully loaded lift car and counterweight, is applied without undue discomfort to passengers or damage to the equipment.

In the case of buffers designs in which the buffers are mounted directly upon the lift car or counterweight a permanently installed, robust, steel pedestal, of not less than 300 mm in height, shall be securely fixed to the floor of the lift well pit in a position corresponding to each buffer impact point.

In the case of hydraulic lifts the stroke of the buffers shall be such that when the buffers are fully compressed that the ram of the hydraulic jack shall not contact the base of the hydraulic cylinder.

In the case of buffers with linear characteristics the stroke of the buffers shall be not less than twice the gravity stopping distance corresponding to 115% of the rated speed of the lift, but in no case shall the stroke be less than 65 mm. The design of the buffers shall be such that the buffer stroke shall be calculated to fall within that arising under the application of a static load of 2.5 and 4 times the mass of the lift car and its rated load, or of the counterweight,

In the case of buffers with non-linear characteristics the average retardation, calculated based upon the fully loaded lift car in free fall striking the buffer at 115% of contract speed, shall not exceed 1 gn; and retardation in excess of 2.5 gn shall be for no longer than 0.04 seconds; and with the return speed of the lift car not exceeding 1.0 m/sec; and without permanent deformation. In any case the maximum peak retardation shall not exceed 6 gn.

In the case of buffers with non-linear characteristics each buffer shall incorporate a permanently fixed data plate which sets out the name of the manufacturer of the buffer; the number of the associated Type Examination Certificate; and the type of the buffer.

A Certificate of Type Test, in accordance with the requirements of Section 5.5 of BS EN81-50, shall be provided in relation to buffers with nonlinear characteristics.

7.10.4 Limits and Switches

The Lift Contractor shall incorporate an 'UP' limit in the lift control circuit such that when the mechanic's lift car top control switch is set to the 'INSPECTION' position and the 'UP' button depressed, the upwards travel of the lift car shall be limited such that inspection and maintenance of any equipment at the top of the lift shaft may be safely undertaken, AND such as to ensure that safe egress is possible through the top floor landing entrance.

The lift control circuits shall incorporate terminal slow down switches and/or shaft limit switches which, in the event of a circuitry or selector malfunction, shall operate such as to safely slow and stop the lift, in a safe and controlled manner, at each of the terminal floors.

The electrical switches and/or devices used shall be designed and constructed in accordance with the requirements of Section 5.11.2 of BS EN81-20. The Lift Contractor shall identify the switches/devices and outlined the proposed operation of these, in the appropriate section of the Schedule of Technical and Constructional details of this Specification.

7.10.5 Limits and Switches

In addition to the previous clause the Lift Contractor shall ensure that all equipment shall be shrouded such as to provide protection from dripping and spraying water to a rating of IPX3 in accordance with BS EN60529.

The shrouds shall be of robust design and construction and shall be suitably resilient such as to last for the Service Life of the Lift. Shrouds and/or enclosures/protection which are based upon polymer or plastic film or sheet will not be accepted.

7.10.6 Stop Switches

The Lift Contractor shall supply and install two stop switches in the lift well pit. One stop switch shall be installed in a position that is readily visible and easily accessible from the landing entrance and at a height of 1 M above the landing sill level and at a horizontal distance not greater than 0.75 M from the inner edge of the landing entrance door frame.

The second switch shall be installed such that this is visible and readily accessible and may be safely operated from a pit refuge space, and in no case shall the stop switch be position in excess of 1.2 M above the pit floor.

The stop switches shall be designed and constructed in accordance with the requirements of Section 5.12.1.11 of BS EN81-20 and shall be of mushroom headed, 'push to stop, pull to release' type.

7.10.7 Pit Communications (Memcom Unit)

A unit shall be provided accessible from the lift pit which will allow two-way communication with a permanently manned rescue service in the event of a person being trapped in the pit. This shall be part of a trapped passenger and car top communication system.

The communication unit shall meet with the requirements of BS EN81-28.

The communication unit shall be located such that this is readily accessible from the floor loft the pit and that this is readily operable from the refuge spaces.

Clear instructions as to the use of the unit shall be provided on, or in close proximity to, the unit.

7.10.8 Pit Refuge Space

With the car on its compressed buffers a safe refuge space as per Table 4 of EN 81-20 shall be provided.

Where the detailed maintenance information identifies that a 2 person tasks are involved with lift maintenance then refuge spaces for 2 persons shall be provided.

A pit refuge space shall be clearly defined within the lift pit by a green bordered mat together with a notice at the entry to the pit consisting of at least a warning triangle sign advising on the posture of the safe refuge space , the number of refuge spaces available and the need to use any mechanical props.

7.11 ELECTRICAL INSTALLATION METHOD

7.11.1 Electrical Installation Method

The Lift Contractor shall install all necessary wiring, trunking and conduit for the lift from the main riser termination within the lift machine room.

All cables, except travelling cables in the lift shaft, shall be enclosed throughout their length in heavy gauge steel conduit or in steel trunking.

The use of existing trunking, conduit and fittings will not be acceptable. All trunking runs shall be at high level and shall not run across the machine room floor. All new trunking, conduit and associated fittings shall have a galvanised finish and made by a manufacturer having a licence to use the British Standard Institution Mark.

All travelling cables shall run direct from the controller to the lift car termination box. Each flex shall be suspended from a clamp provided by the cable manufacturer with adequate protection to the cable coverings. Excessively tight bends will not be acceptable.

In addition to the half way anchorage point for travelling cables, clamps shall be fitted so that there shall be not more than a 3 metre pitch between clamping points above the halfway point up to the machine room.

LSHF (KEBT) coated Kopex conduit shall be used only in cases where it is necessary to provide for adjustment or to reduce the transmission of noise and vibration. The conduit shall terminate in suitable couplings which shall positively grip the flexible conduit and an additional earth continuity conductor shall be run inside the conduit between lengths. Lengths exceeding 450mm shall not be allowed.

These cables shall be 450/750 volt and insulated with high temperature grade polyvinyl chloride and shall comply with BS 6004:2012.

All wiring must comply with the current edition of BS 7671 the IEE Regulations and shall be procured from a reputable manufacturer.

Provision shall be made within the travelling cables for any telephone cables necessary for the car communication system.

Factory manufactured wiring looms for site wiring will be allowed, providing detailed and accurate site dimensions are obtained from site for use during manufacture. Any looms installed which have excessive length or are not generally neatly finished and installed, will be rejected and will have to be returned to the Lift Contractor's manufacturing facility for re-manufacture at 'the Lift Contractor's own expense'.

All wiring, including trailing flexes, shall be insulated with low emission of smoke and halogen free cross-linked insulation, in compliance with BS 7211:2012, BS EN50525-1, BS50525-3-1 and IEC 332-1.

The Lift Contractor shall include for connection of all extraneous metalwork to earth bonding and lighting protection systems terminated in the lift pits.

7.11.2 Wiring Identification (Sleeve Markings)

All wiring within the controller, halfway box and car terminal box shall be clearly identified using sleeve markings. The codes shall be shown on the wiring diagrams.

Alternatively where plug/socket connections are provided each plug shall have a permanent marking corresponding to its socket marking and shall include a method of identifying each cable connection on the plug which shall correspond with information on the wiring diagrams.

7.11.3 Earthing

A separate electrical earth conductor shall be run in all conduits and trunking to every item of electrical equipment from the earth termination in the control panel. This termination shall in turn be connected by means of a suitable conductor to the electrical mains supply earth point.

A separate earth conductor in at least one trailing cable shall be connected to the lift car equipment and to the control panel earth termination.

Each section of trunking shall be electrically and mechanically bonded to the earth conductor by means of brass screw, clamp washers, locking washer and nut.

Al of the earth points shall be identified using coloured tags.

7.11.4 Radio and TV Suppression

All electrical equipment shall be provided, as necessary, with suppressers, to prevent interference to radio, television and computer equipment within the premises in accordance with current British Standards and Telecommunications Guidelines.

The lift and lift equipment shall be design and constructed in accordance with the requirements of BS EN12015 in terms of EMC Emission, and with the requirements of BS EN12016 in terms of EMC Immunity.

7.12 Painting

All equipment shall be suitably prepared, primed, undercoated and then painted with an approved colour before shipment to site. All shaft steelwork within the shaft shall be painted in two coats of machine paint following erection. Any existing steelwork retained within the lift shaft, pit or lift machine room shall be wire-brushed, cleaned, primed, undercoated and then painted with an approved shade of machine paint. Any damage to the painted surfaces which arises prior to completion shall be made good by the Lift Contractor.

Any new steelwork that will not be readily accessible after erection shall be painted with red oxide paint (or paint of similar protective quality) prior to installation.

7.13 Service Barrier

A yellow plastic service barrier shall be provided with the lift installation marked with the Lift Number.

The barrier shall comply with PM 26 and have extending clamps to secure the barrier between the floor and the underside of the entrance architrave header.

The barrier shall fold for storage and have hand holds to facilitate easy carrying.

The barrier shall include all necessary safety and warning signage.

7.14 MRL LIFTS –

Machine room-less lifts shall comply in all respects with the requirements of BS EN81-20: 2014 and BS EN81-50: 2014.

The Lift Contractor's attention is drawn in particular to the requirements of the above Standards in the case that lift equipment supplied is not contained wholly within the lift well or that the equipment is to be maintained from outside of the lift well, and/or by way of inspection doors, access hatches or similar.

7.14.1 Machinery Spaces Inside the Lift Well

Shall be design and constructed such as to:

- Permit easy and safe working on the equipment;
- Provide a clear height of at least 2.1 m at all working areas;
- Provide a clear height of at least 1.8 m for moving between one work area and another;
- Provide a clear horizontal area of at least 0.5 m x 0.6 m at parts which require maintenance and inspection;
- Provide a clear horizontal space at the front of control panels and cabinets which is not less than 0.7 m, measured from the front face of the enclosure, and the full width of the cabinet or panel, and in no case less than 0.5 m.
- Include permanent lighting providing a minimum level of illumination 200 lux and incorporate emergency lighting in accordance with the requirements of this Specification.

7.14.2 Working Areas in the Lift Car or on the Lift Car Roof

Shall be design and constructed such as to:

- Include a permanently installed mechanical device which is designed and constructed in accordance with the requirements of c.5.2.6.4.3.1 of BS EN81-20 shall be provided;
- Include clear instructions in relation to the safe deployment of the device which shall be provided at the Working Area and in the O&M Manual.
- Include permanent lighting providing a minimum level of illumination 200 lux and incorporate emergency lighting in accordance with the requirements of this Specification.

7.14.3 Working Areas in the Lift Pit

Shall be design and constructed such as to:

- Include a permanently installed mechanical device which is designed and constructed in accordance with the requirements of c.5.2.6.4.4.1 of BS EN81-20 shall be provided;
- Include clear instructions in relation to the safe deployment of the device which shall be provided at the Working Area and in the O&M Manual.
- Include permanent lighting providing a minimum level of illumination 200 lux and incorporate emergency lighting in accordance with the requirements of this Specification.

7.14.4 Working Areas on a Platform

Shall be design and constructed such that:

- The platform shall be permanently installed;
- Platforms which are of retractable design include clear instructions in relation to the safe deployment of the platform which shall be provided at the Working Area and in the O&M Manual.
- The design and construction of any retractable platform shall be in accordance with the requirements and provisions set out at Section 5.2.6.4.5 of BS EN81-20;
- Permanent lighting is installed providing a minimum level of illumination 200 lux and incorporate emergency lighting in accordance with the requirements of this Specification.

7.14.5 Machinery Outside the Lift Well

Shall be design and constructed such as to:

- Include a dedicated and suitably design cabinet which shall be designed and constructed in accordance with the requirements of Section 5.2.6.5 of BS EN81-20;
- Permit easy and safe working on the equipment through the open door;
- Provide a clear height of at least 2.1 m at all working areas;
- Provide a clear height of at least 1.8 m for moving between one work area and another;
- Provide a clear horizontal area of at least 0.5 m x 0.6 m at parts which require maintenance and inspection;
- Incorporate provisions for emergency operation and test operations;
- Provide a clear horizontal space at the front of control panels and cabinets which is not less than 0.7 m, measured from the front face of the enclosure, and the full width of the cabinet or panel, and in no case less than 0.5 m.

- Include permanent lighting providing a minimum level of illumination 200 lux and incorporate emergency lighting in accordance with the requirements of this Specification.

7.14.6 Working Areas Outside the Lift Well

Shall be design and constructed such as to:

- Permit easy and safe working on the equipment;
- Provide a clear height of at least 2.1 m at all working areas;
- Provide a clear height of at least 1.8 m for moving between one work area and another;
- Provide a clear horizontal area of at least 0.5 m x 0.6 m at parts which require maintenance and inspection;
- Provide a clear horizontal space at the front of control panels and cabinets which is not less than 0.7 m, measured from the front face of the enclosure, and the full width of the cabinet or panel, and in no case less than 0.5 m;
- Permit access to the equipment only by way of an Inspection Door which shall be designed and constructed in accordance with the requirements of Section 5.2.3 of BS EN81-20 and which is of dimensions 0.5 m in height and 0.5 m in width and which shall permit the required work to be carried out through the door;
- Include permanent lighting providing a minimum level of illumination 200 lux and incorporate emergency lighting in accordance with the requirements of this Specification.

7.15 SILENT OPERATION

The Lift Contractor shall include for taking every practical precaution to ensure quiet operation of the new equipment. Every practical precaution shall also be taken to prevent vibration being transmitted to the building structure from all items of the lift equipment. The Lift Contractor shall indicate, at Section 10 of this Specification, the proposed methods which he proposes to adopt in order to assure quiet operation, and provide details of the noise and vibration levels which are guaranteed to be achieved by the completed installation.

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COMMISSIONING, ACCEPTANCE PROCEDURE AND SERVICE MANUALS

SECTION 8

8.0 COMMISSIONING, ACCEPTANCE PROCEDURE AND SERVICE MANUALS

8.1 Commissioning and Acceptance Procedure

The Lift Contractor shall agree a full commissioning and testing programme with the Engineer. Prior to offering the installation for acceptance tests to the Engineer, the Lift Contractor shall carry out full tests in compliance with BS EN 81 / BS8486. and the specific requirements of the Specification . Any defects arising from his own inspection and testing shall be remedied prior to the installation being offered for acceptance tests. The Lift Contractor will further ensure that the whole installation satisfies the design criteria and functions fully in accordance with the Specification.

The Lift Contractor shall make complete records of the tests utilising test sheets, which shall fully comply with BSEN 81 and BS8486..

The Lift Contractor is responsible for providing all test weights, thermometers and necessary instruments including approved noise and vibration measurement device which shall have been subject to annual calibration testing and tools for carrying out the testing and commissioning of the installation to the satisfaction of the Engineer.

The Engineer shall be given a minimum of five full working days' notice by the Lift Contractor of his intention to offer the installation for acceptance tests and this shall be confirmed in writing.

The Lift Contractor shall be responsible for all the tests to ensure the proper functions and operations of the lift under this Contract. Before the lift is accepted and put into service, the lift shall, under the supervision of the Engineer, pass all the tests detailed within this clause or as required by the Engineer during commission.

a) 25% overload test.

b) 60 minutes full load test.

c) Motor current and speed tests.

d) Door Inspection and tests.

e) Electrical insulation resistance to earth test, earth loop impedance ad RCD test.

f) Earth continuity resistance test.

g) Full load, full speed safety gear test for both downward and upward movement.

h) Buffer test carried out with contract load and at contract speed.

i) Overload test (electrical).

j) RCD electrical protective device tests.

k) Electrical protective device tests.

l) Levelling device tests.

m) Car balance tests.

n) Noise and vibration tests as specified.

o) Induction loop and communication system tests.

The Lift Contractor shall also carry out any other tests required by the Engineer in order to prove that the equipment complies with the contract documents, codes and regulations covering equipment supplied under this sub-contract.

Generally, the lift shall be made to run under various loading conditions from no load to 25% overload in order to check its operation and floor levelling accuracy.

The 25% overload test is to ensure that the equipment installed has ample safety margin above the rated load incorporated in the design.

The lift shall also be subject to a 60-minute test, which shall provide the adequacy of all components to achieve the rated starts per hour of the equipment, with the car fully loaded, during which it shall stop at each floor in the up and down direction, opening and closing its doors at each stop. The test shall be continuous, the stops being 10 seconds maximum duration, with the doors open. During the test, the equipment should not overhead, spark excessively, become noisy or operate in a faulty manner.

All the tests shall be carried out in the presence of the Engineer and the results shall be signed and recorded in a tabulated form for easy checking and reference.

8.2 Health & Safety File and Service Manuals

The Lift Contractor shall provide a separate Health & Safety File as detailed in the CDM Regulations, including risk assessments, COSHH data, accident records and any other relevant data and information.

The Lift Contractor shall ensure that the Manuals and certificates are available at the time of hand over of the Lift in accordance with The Lifts Regulations.

Duplicate copies of the service manual are to be provided and these shall comprise the following:-

8.2.1 Documents

Full written general description of the equipment as installed identifying its main operational features.

Sequence of operations applicable to the functioning of all control apparatus.

Nomenclature detailing all symbols and forms of identification used on the equipment, drawings or circuit diagrams applicable to the installation.

Fully descriptive list of components which it is anticipated may require regular or routine replacement due to “fair wear and tear”. The minimum information provided shall ensure that ordering of replacement components can be achieved.

Maintenance schedule detailing all areas of routine regular servicing and including all settings and adjustments as well as software parameters.

Where a hand held or portable-interrogating device is provided for fault finding, instructions for its use and data sheets for interpreting the information are to be included.

The interrogating device is as described in the “Controller” clause of this Specification.

Full details of recommended methods of cleaning all finishes, including any special materials required.

8.2.2 Test Certificates

Two copies of the site test certificates in respect of the tests carried out at the time of commissioning of the equipment. These are to be fully completed and signed by a competent person authorised by the Lift Contractor.

a) Hoisting ropes)
) Each certificate identified with its lift number
b) Governor ropes)

c) Overspeed governor

d) Hosting motor

e) Door gear motor

f) Car and counterweight buffers

g) Safety gear

h) Fire Certificate for landing and car doors

i) Lifting beam or eyes (where applicable)

j) Electrical completion certificate to BS 7671

k) Certificate of Conformity

8.2.3 Drawings and Circuit Wiring Diagrams

Full set of circuit diagrams which shall incorporate any and all amendments which have been carried out prior to the equipment being accepted by the Engineer.

Complete set of wiring and "as fitted" drawings in respect of the completed installation.

Complete set of builders work and general arrangement drawings, including landing entrances and lift car interior perspective.

8.2.4 Inspection Certificates

This section shall be provided for the future retention of Inspection Certificates in accordance with SAFed Recommendations.

8.2.5 Maintenance Contract and Inspection Reports

This section shall be provided for the future retention of maintenance reports and the maintenance contract documents.

8.2.6 Warranties & Guarantees

Each manual shall retain copies of the manufacturer's or supplier's guarantees or warranties on products as described in the Preliminaries Section of this document.

8.3 Noise & Vibration Tests

Where specified, carry out a Lift Noise & Vibration test to verify the performance criteria detailed in below have been met.

8.4 Noise

Noise levels shall not exceed those indicated in the schedule and the Contractor shall demonstrate using an approved measuring instrument, which has a valid calibration certificate, that the installation meets those requirements.

Car noise shall be measured at 1.5m from the floor and approximately 1m from the door face with a Precision grade type 1 sound level meter set to "fast" meter response.

8.4.1 Top Lift Lobby

Top Lift Lobby measurements shall be made with a precision grade sound level meter fitted with an octave band filter set. The positions at which measurements are made should be noted on a drawing showing the principle noise-producing elements of the lift machinery. No measurement is to be closer than 1m from any wall or floor surface. All measurements are to be made using the "fast" meter response.

The dB level over a complete cycle of lift operation shall not exceed the values indicated in the schedule.

Noise levels on the landing shall be measured 1m from the face of the doors at a height of 1.5m above FFL.

8.4.2 Lift Car

The noise levels in the lift car shall be measured in the centre of the car, 1.5m above floor level, during a full cycle in each direction of travel, as defined below, with both vent fan running and switched off.

8.4.3 Lift Vibration

Vibration measurements are to be made at the centre of the car, on the floor, in three mutually perpendicular axes corresponding to vertical, front-to-back, and side-to-side. Measurements are to be made using an approved measuring instrument which has a valid calibration certificate of noise and vibration levels in each direction over two complete cycles, one from the bottom of the building to the top, and one from the top of the building to the bottom.

A cycle is defined as the period from just before the doors start to close at one level, to just after the doors open at the final level.

Vibration levels are to be measured in mg, as r.m.s. values using a time constant of 0.125 seconds ("fast"), and the maximum values recorded in each 1/3 octave band from 1 Hz to 80 Hz inclusive over each complete cycle.

Acceleration, deceleration and jerk rates shall also be measured and confirmed.

8.5 Handover Procedure

Before offering the equipment for acceptance, the Lift Contractor shall ensure that works identified during the witness tests as remedial items have been completed to his satisfaction and the Operating and Maintenance Manuals with relevant certification are available.

If the handover is delayed because remedial items are outstanding, the Defects Liability Period commencement will be deferred until the items have been completed to the Engineer's satisfaction.

Prior to, or during handover, the Lift Contractor shall provide on-site training to the Purchaser/Employers representatives, comprising practical instruction and demonstration of emergency release, hand winding operation, which are safe to be carried out by non-lift engineers. This will also include instruction on procedures for calling Lift Contractor if the release is either unsuccessful or deemed unsafe for the Purchaser/Employers representative to carry out.

At handover, the Lift Contractor shall provide for the Purchaser's use the following:-

a) 3 sets of keys for each key switch on the installation.

b) 3 landing door release keys.

c) A typed document encapsulated in plastic giving full details of the Lift Contractor's local and national emergency breakdown and call out procedure inclusive of phone numbers.

MAINTENANCE

SECTION 9

9.0 MAINTENANCE

The lift contractor shall commence work on the lift from time of possession.

Upon Completion and handover the Lifts Contractor shall maintain the lifts on a Comprehensive basis as below until the end of the DLP period.

The end of the DLP period shall be a common date which shall be 12 months after handover of the last completed lift in the scheme. The DLP on three of the lifts will therefore be in excess of 12 months.

9.1 Comprehensive Form of Contract

Maintenance

The Lift Contractor shall provide a price for the Comprehensive Form of Maintenance Contract in the Summary of Prices, Section 10 of this Specification. Samples of the schedule of planned maintenance and record cards are also to be included with the Tender. At commencement of the defects liability period, these shall be in place in the machine room and completed at each visit.

The frequency of maintenance during the Defects Liability Period shall be monthly with not less than 21 days and not more than 36 days between PPM visits.

At monthly intervals throughout the defect liability period, the Lift Contractor shall provide computer generated information on breakdowns and call outs for the previous period. This shall be completed giving details of each breakdown.

Comprehensive Form of Contract

Excluded from the Lift Contractor's responsibility on maintenance are:-

a) Decorative finishes of the car enclosure, car and landing entrances except where damage is a result of the Lift Contractor's own misuse or abuse.

b) Cleaning of the lift shaft fabric and enclosure walls.

c) Buried piping and cylinders on hydraulic lifts.

d) Any modification to the lift equipment carried out by others during the term of the Contract, whether mechanical or electrical.

e) The incoming mains power supply cable to both power and lighting circuits in connection with the lift installations.

f) Failure of the lift equipment due to indisputable misuse as these repairs will be chargeable as an extra to the contract.

Included in the Lift Contractor's responsibility will be the provision of all labour and material for the correct adjustment repair and/or replacement where conditions warrant of all other component parts of the lift installations not specifically excluded.

Cleaning of all equipment in the lift shaft and lift pit.

Provision of all cleaning material and correct lubricants to equipment manufacturer's specifications for the correct maintenance of the lift equipment. No stocks of lubricating oil or lubricants of an inflammable nature will be allowed to be retained on site at any time.

Whenever the lift is not available for service whilst the Lift Contractor is working on or inspecting it, the Lift Contractor shall provide a suitable barrier at each entrance under inspection to indicate that the installation is not available for service. Before using any such barrier, a sample design shall be submitted for approval to the Purchaser's Representative. When

not in use, the barrier is to be retained in the machine room mounted on purpose made brackets or an agreed location on site. At the expiry of the maintenance contract, the barrier will remain the property of the Purchaser. The barrier shall be collapsible in design, painted safety yellow and be fitted with a suitable "DANGER" notice.

"Out of service" indicator notices shall be placed on each landing whenever a lift is removed from service for either maintenance or repair.

All inspections in compliance with the SAFed Recommendations as amended from time to time are to be carried out when they fall due and copies of the certificates provided to the Purchaser's Representative.

a) Gear box, brake, sheaves and pulleys.

b) Safety gear, governor rupture valves and associated devices.

c) Levelling and re-levelling devices.

d) Locks and interlocks.

e) Terminal limits.

f) Rams, cylinders and chains/ropes for hydraulic lifts.

g) Electrical safety devices.

h) Overload devices.

i) Electrical tests as required by BS 7671.

A reasonable stock of replacement lamps and fluorescent tubes for use within the motor room, lift car and all indicators and push units is to be retained in the lift machine room.

Following each inspection, a report is to be forwarded to the Purchaser's Representative within one calendar month. All reports shall:

a) Relate to one inspection of the lift.

b) State clearly the work done and adjustments made and indicate which car and/or landing indicator lamps if any were renewed at the time of the inspection.

c) Certify that the lift is or is not in a satisfactory safe and serviceable condition.

d) Give details of attendance to any breakdowns during the period since the date of the preceding inspection report.

The Lift Contractor shall include for annual re-programming of the auto dialler within the costs given.

The Comprehensive Contract shall include for operational guarantees by the Lift Contractor to the Employer for:

i) Response times to breakdowns not exceeding:
45 minutes - at any time when a person is trapped within the car
2 hours – during normal office hours) where no trapping has
3 hours – outside normal office hours) occurred

Normal house shall be considered as 08.00 ~ 1800 Mon ~ Fri and 08.0 ~ 14.30 Sat .

Outside of Normal Hours shall be considered as 18.00 until 08.00 Mon Thurs , 18.00 Fri ~ 08.00 Sat 14.00 Sat ~ 08.00 Mon

ii) Repair and replacement component availability to be stated, including an agreed schedule of "down" time.

iii) Maintenance during agreed periods as determined by the Purchaser's requirements.

iv) Rebate or rescheduling as Purchaser discretion for any missed maintenance visits.

v) Maintenance visits planned and advised in advance by means of annual planner provided at handover.

vi) 6 sets of encapsulated details to be provided at handover giving full details of contact procedure for trappings, breakdowns and routine maintenance.

The client requires the contractor to operate an in house emergency call out desk which shall not be subcontracted outside of normal hours. Evidence of this must be provided with the tender.