Dated **23 December 2025**

Merseytravel

- and -

Rubax Lifts Limited

Mann Island Lifts Replacement

Mrs Louise Outram
Secretary
Merseytravel
No 1 Mann Island
Liverpool L3 1BP

Ref: LDS/MH/4324781

THIS AGREEMENT made 23 December 2025

BETWEEN

(1) **MERSEYTRAVEL** of No.1 Mann Island, Liverpool, L3 1BP (hereinafter called the **'Purchaser'**) of the one part

AND

(2) **RUBAX LIFTS LIMITED** incorporated and registered in England and Wales with company number 01509899 whose registered office is at Wilson House Cinnamon Park, Fearnhead, Warrington, Cheshire, WA2 0XP (hereinafter called the '**Contractor'**) of the other part

Recitals

A) The Purchaser wishes to have certain Works executed by the Contractor, briefly described as:

the replacement of four commercial passenger lifts in the building located at 1 Mann Island, Liverpool, L3 1BP

B) The Purchaser has agreed to engage the Contractor for the design, manufacture, delivery to Site, installation, testing and completion of the Works and the remedying of defects in the Works in accordance with the Contract, under the direction of the Engineer, in the sum of £1,007,388 (one million seven thousand three hundred eighty eight pounds) (the **'Contract Price'**)

C) The Contractor shall also provide the maintenance services detailed in the Specification (the '**Maintenance Services'**) in accordance with the rates detailed in the Tender (the '**Maintenance Price'**)

It is agreed as follows:-

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the General Conditions

2. The following documents shall be deemed to form and be read and construed as part of the Contract:

(a) this Agreement;

(b) the Letter of Acceptance (if any);

(c) the Appendix;

(d) the Special Conditions;

(e) the General Conditions;

(f) the Specification;

(g) the drawings (if any) annexed to, or referred to in, the Contract;

(h) the Schedules; and

(i) the Tender.

3. In consideration of the payments to be made by the Purchaser to the Contractor in accordance with the Contract, the Contractor agrees to design, manufacture, deliver to Site, install, test and complete the Works and to remedy defects in the Works in conformity in all respects with the provisions of the Contract.

4. The Purchaser shall pay the Contractor, in consideration of the execution and completion of the Works and the remedying of defects in the Works, the Contract Price or such other sum as may become payable under the provisions of the Contract together with any applicable value added or sales tax properly chargeable on such sums, at the times and in the manner prescribed by the Contract.

5. If any question, dispute or difference shall arise between the Purchaser and the Contractor in relation to the Contract or in any way related to the Works, which cannot be settled amicably, it shall be determined in accordance with Clause 52 and 53 (Disputes) of the General Conditions.

IN WITNESS whereof the parties have executed and delivered this Agreement as a deed on the date above written

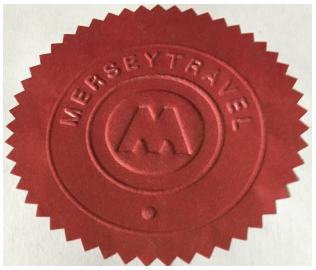
EXECUTED AND DELIVERED as a DEED by
MERSEYTRAVEL

in the presence of:-

Louise Outram
Louise Outram (Dec 23, 2025 07:10:39 GMT) ..... Signed

Louise Outram ..... Name

Chief legal officer ..... Title



no 1575

EXECUTED AND DELIVERED as a DEED by
RUBAX LIFTS LIMITED

in the presence of-:

..... Signed

Dave Verey ..... Name
Director

..... Signed

Peter Verey ..... Name
Director

The Terms and Conditions comprise the:

Model Form MF/1 (Rev 7) Model Form of Contract for the design, supply and installation of electrical, electronic and mechanical plant (2024 Edition) including:

- Form of Agreement
- General Conditions (as amended)
- Form 6: Notice of Delegation of Authority
- Form 7: Variation Order
- Form 8: Taking-Over Certificate
- Form 9: Sub-Contract

amended as set out below in:

- the amendments and additions to the General Conditions of Contract attached hereto; and
- the Special Conditions of Contract attached hereto

Amendments and Additions to the General Conditions of Contract

Where Clause numbers are specified here they refer to the General Conditions of Contract unless otherwise indicated.

Clause 1 - Definitions	
Sub-Clause 1.1.14	The wording of this sub-clause is deleted entirely and substituted by:- "The Engineer" shall mean "the Director of Customer and Operations" for the time being of the Purchaser or any other person appointed from time to time by the Purchaser and notified to the Contractor pursuant to Clause 2.3"
Sub-Clause 1.1.40	This sub-clause is deleted entirely and substituted by:- "'Time for Completion' means the period of time for completion of the Works or any Section thereof as stated in the Appendix or as extended under Sub-Clause 33.1 (Extension of time for completion) calculated from the date specified in the Appendix as the date for commencement of the Works."
Clause 2 - Engineer and Engineer's Representative	
Sub-Clause 2.1 Sub-Clause 2.8	Delete the 2nd paragraph of sub-clause 2.1 This sub-clause is deleted entirely and all references to it in these General Conditions of Contract are also deleted.
Clause 5 - Basis of Tender and Contract Price	
Sub-Clause 5.1	The wording of this sub-clause is deleted entirely and substituted by:- "The Contractor shall be deemed to have inspected and examined the Site (including any applicable safety regulations of the Purchaser) and its surroundings and to have satisfied himself as to the nature of the ground, sub-soil and the conditions of any surrounding facings, brickworks, and associated structures (so far as is practicable and having taken into account any information in connection therewith which may have been provided by or on behalf of the Purchaser) the form and nature of the Site, the extent and nature of the Works and the Plant necessary for the completion of the Works, the means of communication with and access to the Site, the accommodation he may require and in general to have obtained for himself all necessary information (subject as above mentioned) as to risks contingencies and all other circumstances influencing or affecting the Tender"
Clause 6 - Changes in Costs	
Sub-Clause 6.2	The wording of this sub-clause is deleted entirely.
Sub-Clause 6.1	This sub-clause is re-numbered 6.2 and a new sub-clause 6.1 is inserted as follows:
New Sub-Clause 6.1	The Contractor shall ascertain and conform in all respects with the provisions of any general or local Act of Parliament and the regulations and bye-laws of any local or other statutory authority which may be applicable to the Works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the Purchaser

	indemnified against all penalties and liabilities of every kind for the breach of any such Act, regulation, bye-law provided always that:-
	(a) the Contractor shall not be required to indemnify the Purchaser against the consequences of any such breach which is the unavoidable result of complying with the drawings specification or instructions of the Engineer
	(b) if the drawings specification or instructions of the Engineer shall at any time be found not to be in conformity with any such Act regulation, bye-law the Engineer shall issue such instructions including the ordering of a variation under Clause 27 as may be necessary to ensure conformity with such Act, regulation, bye-law.
	(c) the Contractor shall not be responsible for obtaining any planning permissions or consents which may be necessary in respect any Works or any temporary Works specified or designed by the Engineer and the Purchaser hereby warrants that all the said permissions have been or will in due time be obtained.
Clause 7 - Agreement	
Sub-Clause 7.1	delete “45 days after the Letter of Acceptance” and insert “14 days of receipt of the same”
Clause 9 - Details Confidential	
Sub-Clause 9.1	This sub-clause is deleted entirely and substituted by:- "The Contractor shall not without the consent in writing of the Engineer disclose particulars of the Contract to any person or furnish or publish or permit to be furnished or published any information with regard to the Purchaser's business to any person save insofar as may be necessary for the due performance of the Contract and shall preserve strict confidence with regard to any information of a confidential or secret nature received from the Purchaser or the Engineer. The Contractor shall not give any information concerning the Contract or the Works for publication in the press, or on radio, television, screen or any other medium without the prior written consent of the Engineer."
	The following sub-clause is inserted:-
Sub-Clause 9.2	The Contractor acknowledges that the Purchaser is subject to the provision of the Freedom of Information Act 2000 and that any information provided by the Contractor to the Purchaser under the Contract may need to be disclosed to third parties under the provisions of such legislation (and/or any accompanying codes of practice issued under the Freedom of Information Act 2000).
Sub-Clause 9.3	The following sub-clause is inserted:- "Advertising and Publicity No advertising whatsoever on either temporary or permanent hoardings or on any other parts of the Works shall be allowed except such as the Purchaser may require for their own purposes. The Contractor shall provide standard notice boards advertising the Works if directed by the

	Engineer and will be permitted to mount a small board with the Contractor's name. No photograph shall be taken or details describing the Works published nor shall any member of the public be allowed to inspect the Works without the consent of the Engineer."
Clause 11 - Purchaser's General Obligations	
Sub Clause 11.1	After "imposed" insert "The Purchaser and the Engineer shall have the right of access to the Site at all reasonable times and the right to make physical examination of the Works.
Sub-Clause 11.2	This sub-clause is deleted entirely and all references to it in these Conditions of Contract are also deleted.
Sub-Clause 11.3	This sub-clause is deleted entirely and all references to it in these Conditions of Contract are also deleted.
Sub-Clause 11.5	This sub-clause is deleted entirely and all references to it in these Conditions of Contract are also deleted.
Sub-Clause 11.6	delete "Appendix" and insert "Contract". delete “at the point(s) specified in the Contract”
Sub-Clause 11.7	delete "Appendix" and insert "Contract".
Clause 13 - Contractor's General Obligations	
Sub-Clause 13.1	After "of the Works" insert the words "The Contractor shall commence the Works on or as soon as is reasonably possible after the date of commencement of the Works stated in the Appendix. Thereafter the Contractor shall proceed with the Works with due expedition and without delay in accordance with the Contract. The Contractor shall keep a sufficient number of competent workmen foremen and supervisory staff and a sufficient quantity of material and adequate Plant and Contractor’s Equipment on and about the Site to ensure the Works can be carried on safely and at a regular rate of progress without interruption or delay".
Clause 14 - Programme	
Sub-Clause 14.1(d)	Item (iv) is deleted entirely.
Clause 19 - Hours of Work	
Sub-Clause 19.1	This sub-clause is deleted entirely and substituted with “The Purchaser shall give the Contractor facilities for carrying out the Works on the Site between the hours of 09:00 to 17:00 Monday – Friday (excluding public and bank holidays).
Sub-Clause 19.2	This sub-clause is deleted entirely.
Clause 22 - Contractor's Obligations (Setting Out)	
	The following sub-clauses are inserted:-
Sub-Clause 22.2	The Contractor shall within the time stated in the Programme or, if not so stated, before the time specified for delivery of any Plant to the Site, obtain all consents, way leaves and approvals in connection with the

	regulations and bye-laws of any local or other authority which shall be applicable to the Works on the Site.
Clause 34 - Delay	
Sub-Clause 34.1	after "each week" insert the words "or part thereof".
Clause 36 - Defects Liability	
Sub-Clause 36.9	This sub-clause is deleted entirely and all references to it in these Conditions of Contract are also deleted.
Clause 39 & 40 - Certificates and Payment	
Sub-Clause 39.7	This sub-clause is deleted entirely and all references to it in these Conditions of Contract are also deleted
Sub-Clause 40.8	At the end of this Clause add the following words: Unless otherwise stated in the Appendix the Contract Price is deemed to exclude Value Added Tax. To the extent that Value Added Tax is properly chargeable on the supply to the Purchaser of any goods or services provided by the Contractor under the Contract, the Purchaser shall pay such Value Added Tax to the Contractor as an addition to payments otherwise due to the Contractor under the Contract.
Clause 43 - Accidents and Damage	
Sub-Clause 43.1	The following sentence is to be inserted before the first sentence:- "The Contractor shall properly cover up and protect until the date of taking-over any Section of the Works liable to injury by exposure to the weather and shall take every reasonable precaution to protect any Section of the Works not taken over against loss or damage from any cause"
Sub-Clause 43.6	the sentence beginning "The Purchaser shall indemnify" is deleted
Clause 44 - Limitation of Liability	
Sub-Clause 44.3	The wording of this sub-clause is deleted entirely and substituted by:- "The liability of the Contractor to the Purchaser under these Conditions for any one act or default is as set out in the Appendix"
Sub-Clause 44.4	This sub-clause is deleted entirely and all references to it in these Conditions of Contract are also deleted
Clause 47 - Insurance	
Sub-Clause 47.2	delete the words "so far as reasonably possible"

Sub-Clause 47.7	delete the words "from time to time, when so required by the Engineer" and replace with the words "prior to commencement of the Works"
Sub-Clause 55.1	Insert new sub-clause 55.2: “The Purchaser shall be entitled to terminate this Contract and recover from the Contractor the amount of any loss resulting from such termination if the Contractor is in breach of its obligations under Clause 55.1. If the Contract is determined under this sub-clause 55.2 hereof the Contractor shall be debarred from again tendering for the Purchaser's work for a period of three years or such other time as the Purchaser otherwise determines”.
Additional Clauses **Clause 57 - Unlawful Discrimination**	
Sub-Clause 57.1	The Contractor shall not in respect of any persons employed by them (whether in execution of the Contract or otherwise) in every factory, workshop or place situated in the United Kingdom and occupied or used by them for the execution of the Contract discriminate within the meaning and scope of the provisions of the Equality Act 2010 or any statutory modifications or re-enactments thereof
Clause 58 - Health and Safety Requirements	
Sub-Clause 58.1	The Contractor shall comply with all Health and Safety legislation; and any guidance notes issued by the Health and Safety Authority, Environmental Health or other enforcing agencies and shall pay all costs in respect thereof.
Sub-Clause 58.2	The Purchaser shall supply to the Contractor a copy of their Health and Safety Document - Local Arrangements for Contractors when the Tender is issued. This should be duly completed by the Contractor and returned with the said Tender. The Contractor shall comply with the Purchaser’s Health and Safety Document - Local Arrangements for Contractors.
Sub-Clause 58.3	The Contractor shall supply to the Purchaser prior to the commencement of the Works the current health and safety policy of the Contractor
Sub-Clause 58.4	The Engineer or Safety Officer of the Purchaser shall be empowered to suspend the provision of the Works or Sections thereof in the event of non-compliance by the Contractor with its Health and Safety Policy, the Purchaser’s Health and Safety Document - Local Arrangement for Contractors, or with its legal duties in health and safety matters. The Contractor shall not resume provision of the Works or Sections thereof until the Engineer or Safety Officer of the Purchaser is satisfied that the non-compliance has been rectified
Sub-Clause 58.5	The Contractor shall make themselves fully conversant with all Mersey Tunnel safety procedures and shall agree with the Mersey Tunnel Police any special procedures to be followed for the evacuation of personnel in the event of an emergency
Sub-Clause 58.6	The Contractor shall prior to commencement of the Works provide the name of a director or partner who has the final responsibility for safety

	and details of how they may be contacted and provide the name(s) of their safety adviser or safety supervisor
Sub-Clause 58.7	The Contractor shall agree to the Purchaser's Health and Safety Officer monitoring their health and safety performance. The Purchaser's Health and Safety Officer may call upon the Engineer to assist in this monitoring role
Sub-Clause 58.8	The Contractor shall not allow connivance or neglect of any of its employees or sub-contractors to intentionally or recklessly interfere or misuse anything provided in the interest of health, safety or welfare
Sub-Clause 58.9	The Contractor agrees to comply with and make all of its employees and sub-contractors aware of the details of the Purchaser's Safety Policy, relevant safe systems of work and relevant health and safety issues
Sub-Clause 58.10	The Contractor shall agree to act promptly on any reasonable request by the Purchaser's Health and Safety Officer to make improvements in their health or safety performance
Sub-Clause 58.11	The Contractor shall report to the Purchaser's Health and Safety Officer or Engineer of any hazardous conditions which are outside its control but which might expose its employees and/or other persons to risk
Sub-Clause 58.12	**CDM** The Contractor is hereby appointed to and shall undertake the role of Principal Contractor for the purposes of the Construction (Design and Management) Regulations 2015 and Building Regulations 2010. The Contractor must be prepared to accept the role of Principal Contractor and to carry out all duties of Principal Contractor.
Sub-Clause 58.13	Without limiting its statutory and regulatory duties and responsibilities, the Contractor undertakes to the Purchaser that in relation to the Works and site it will duly comply with the Construction (Design and Management) Regulations 2015 and as applicable Part 2A of the Building Regulations 2010, and in particular but without limitation: i) comply with regulations 8 to 10 and 15 of the Construction (Design and Management) Regulations 2015; and ii) comply with regulations 11F, 11J, 11K, 11L and 11N of the Building Regulations 2010.
Clause 59 - Contractor's Records	
Sub-Clause 59.1	The Contractor shall keep proper records necessary for the satisfactory completion of the Contract including wages, records and time sheets showing the wages paid to and the time worked by the work people in his employ in and about the execution of the Contract, and all such records shall be produced whenever required for inspection by any officer authorised by the Purchaser
Clause 60 - Third Party Rights	
Sub-Clause 60.1	For the purposes of Section 1(2) of the Contracts (Rights of Third Parties) Act 1999 the parties state that they do not intend any term of

	this Agreement to be enforced by any third party but any third party right that exists or is available independently of that Act is preserved.
Clause 61 – Public Procurement	
Sub-Clause 61.1	The Contractor acknowledges and hereby agrees that the Purchaser shall be entitled to publish this Agreement in full in accordance with Section 53 of the Procurement Act 2023 and any modifications to the Agreement in accordance with Section 74, 75 and 77 of the Act.
Sub-Clause 61.2	The Purchaser shall, prior to publication of the Agreement, consult with the Contractor on the manner and format of publication and to inform the Contractor of its decision regarding any redactions but the Purchaser shall have the final decision in its absolute discretion as to the extent of the content disclosed. The Contractor shall assist and co-operate with the Purchaser to enable the Contractor to publish this Agreement in accordance with section 53 of the Procurement Act 2023.

General Conditions of Contract

Appendix

Numbers refer to the General Conditions' sub-clause numbers unless otherwise stated

1.1.14 **Engineer**	The Engineer is Director of Customer and Operations of Merseytravel.
1.1.19 **The International Contracts Schedule**	Does not form part of the Contract
1.1.21 **Nominator**	The Nominator is from the Institute of Engineering & Technology
1.1.25 **Performance Tests**	The Performance Tests are set out in the Specification
1.1.30 **Schedules**	The following Schedules form part of the Contract: Schedule of Prices Schedule of Tests on Completion Schedule of Performance Tests Schedule of recommended spare parts
1.1.31 **Sections**	The Works are not divided into the following Sections: Lift 1 (Lift A) Lift 2 (Lift B) Lift 3 (Lift C) Lift 4 (Lift D)
1.1.33 **Special Conditions**	The following Special Conditions form part of the Contract: Special Condition 1: "The Contractor shall provide the Maintenance Services from the date specified for the commencement of the Works until 2 years after the expiry of the Defects Liability Period ('**Maintenance Period**'). Unless otherwise terminated, notwithstanding any other terms of this Contract, this Contract shall remain in force until the expiry of the Maintenance Period." Special Condition 2: "The Contractor shall provide the Maintenance Services using personnel of the required skill, experience and qualifications and with all due skill, care and diligence including in accordance with good industry practice (being the exercise of that degree of skill, care, prudence, efficiency, foresight and timeliness as would be expected from a leading company within the relevant industry or business sector)." Special Condition 3: "All spare parts used in the Maintenance Services shall be either new, or reconditioned or reassembled spare parts which are equivalent to new spare parts in performance. All consumables shall be new. The Supplier will transfer to the Buyer, with full title guarantee and free from all third party rights, all the spare parts and consumables that it provides to the Buyer, and the spare parts and

	Consumables shall become part of the associated equipment upon their installation." Special Condition 4: "The terms 'Pre-Defects Liability Period Maintenance', 'Defects Liability Period Maintenance' and 'Post-Defects Liability Period Maintenance' shall have the meanings attributed to them in the pricing document contained in the Tender." Special Condition 5: "The Contractor shall submit to the Buyer invoices for the Maintenance Price as follows: i) for the Pre-Defects Liability Period Maintenance, monthly from the date specified for the commencement of the Works until the commencement of the Defects Liability Period; ii) for the Defects Liability Period Maintenance, annually from the commencement of the Defects Liability Period until the expiry of the Defects Liability Period; and iii) for the Post-Defects Liability Period, annually from the expiry of the Defects Liability Period until the expiry of the Maintenance Period. Special Condition 6: "The Buyer shall pay valid and undisputed invoices for the Maintenance Price within 30 days of receipt."
1.1.40 **Time for Completion**	The Time for Completion of the Works means 24 months
	The date specified for the commencement of the Works is 1 December 2025
	The following matters are conditions precedent to commence the Works: N/A
2.1 **Engineer's Duties**	For the purposes of this Contract the Engineer is also an employee of the Purchaser and permitted to act on behalf of the Purchaser
4.1 **Precedence of documents**	The order of precedence of the documents forming the Contract is as follows: (a) the Agreement; (b) the Letter of Acceptance (if any); (c) the Appendix; (d) the Special Conditions; (e) the General Conditions; (f) the Specification; (g) the drawings annexed to, or referred to in, the Contract; (h) the Schedules; (i) the Tender.
5.5 **Prime cost items**	Percentage to be added: 5 %

6.2 **Labour, materials and transport**	Sub-clause 6.2 of the General Conditions shall not apply
8.1 **Provision of bond or guarantee**	N/A
10 **Notices**	Purchasers contact details: Chief Legal Officer, Merseytravel, No.1 Mann Island, Liverpool, L3 1BP Fax: N/A Email address: legal@liverpoolcityregion-ca.gov.uk Contractor's contact details: Dave Verey. Director, Rubax Lifs Limited, Wilson House Cinnamon Park, Fearnhead, Warrington, Cheshire, WA2 0XP Email address: davev@rubax.co.uk
11.5 **Purchaser's lifting equipment**	N/A
11.6 **Utilities and Power**	As set out in the Amendments and Additions to the General Conditions of Contract
11.7 **Power, etc. for tests on site**	As set out in the Amendments and Additions to the General Conditions of Contract
14.2 **Form of programme**	The Programme shall be in the following form: The Programme will show the order in which the Contractor proposes to carry out and complete the Works within the time stated in the Appendix. The Programme is to show the phasing of Works diagrammatically, in weeks from the date specified for commencement of the Works and is to be accompanied by sufficient explanatory notes of the Contractor's anticipated methods to make the Contractor's proposals clear. The resources intended for each event shall be clearly indicated on the Programme.
18.2 **Site services**	N/A
34.1 **Delay in completion**	Percentage of Contract Value to be paid or deducted for each week (or part thereof) to the completion of the whole of the Works: 1% Maximum percentage of Contract Value which payments or deductions shall not exceed: 10%
34.2 **Prolonged Delay**	Maximum loss recoverable by the Purchaser: The Contract Price
35.8 **Consequences of failure to pass performance tests**	damages for any failure to pass Performance Tests shall be treated wherever they cause delay to the Programme as delays to Completion and the details for such delays are set out in the Appendix

36.1 **Defects after taking-over**	The Defects Liability Period for all sections of the Works shall be twelve (12) months commencing on taking-over the final Section of the Works.
36.3 **Notice of defects**	The Defects Liability Period in respect of any repair or replacement shall not extend beyond 24 months from the date of taking-over the final Section of the Works.
36..10 **Latent Defects**	The period of time for defects to be made good or repaired or replaced by the Contractor is 12 years.
39.1 **Payment by instalments**	The Contractor is entitled to monthly payments in respect of: The value of work executed on Site; less Retention of 5%. The Contractor shall be entitled to release of retention as follows: (a) half of the amount retained within 30 days after presentation of the Taking-Over Certificate; and (b) the balance of the amount retained within 30 days after presentation of the final certificate of payment. Where Sections are applicable, if any Section of the Works is taken over separately under Clause 29 (Taking-over) the release of the retention on or after taking-over shall be made in respect of the Section taken over and reference to the retention shall mean such part of the retention as shall, in the absence of agreement, be apportioned to such Section by the Engineer.
39.2 **Time for application**	Application for interim payment certificates shall be made on or after the first Monday of each calendar month.
39.3 **Form of application**	Each application for a payment notice shall be supported by separate sheets setting forth in detail the amount of the Contract Price and particulars of the Works executed on the Site and of the Plant delivered to the Site pursuant to the Contract since the period covered by the last preceding certificate (if any)
40.4 **Delayed payment**	The rate of interest on overdue payment shall be 2% above the Bank of England Base Rate in force from time to time during the period of delay.
40.6 **Advance payment**	Advance payment does not apply
40.7 **Currencies of payment**	The Contract Price (including any adjustments) shall be paid in pound sterling (£/GBP) only
40.8 **Taxes**	N/A
41.2 **Allowance for profit on claims**	Percentage to be added: 5%
44.3 **Limitation of Contractor's liability**	Limit of liability: £10,000,000 (ten million pounds).

47.4 **Third party insurance**	The Contractor shall effect third party insurance for a minimum amount of £10,000,000 (ten million pounds) for any one claim or series of claims arising from the same incident.
47.5 **Professional Indemnity Insurance**	The Contractor shall effect professional indemnity insurance for a minimum amount of £10,000,000 (then million pounds) for any one claim or series of claims arising from the same incident. The Contractor shall maintain professional indemnity insurance for 24 months after the date stated in paragraph 1 of the Taking-Over Certificate for the final Section of the Works.
52.1 **Arbitration**	The arbitration shall be conducted in accordance with the provisions of the UK Arbitration Act 1996 (as amended).
53.1 **Adjudication**	Adjudication shall be in accordance with rules chosen and determined by the adjudicator at the outset of the adjudication.
56.1 **Applicable law**	The substantive law of the contract is the law of England

SPECIFICATION

SPECIFICATION FOR THE REPLACEMENT

OF

4 NO. PASSENGER LIFTS

LOCATED AT

MANN ISLAND
LIVERPOOL
L3 1DP

Contents

SECTION 1

PRELIMINARIES AND CONDITIONS OF CONTRACT

1 CONDITIONS OF CONTRACT

The Conditions of Contract are to be in accordance with those specified within the invitation to tender.

1.1 Preliminaries & Conditions of Contract

Scope of Works

All works described herein indicate the performance requirements and design intent only. The Lift Contractor shall include within their tender submission for the development and completion of the design, including all necessary liaisons with other disciplines and with statutory authorities.

Description of the Works and Purpose of the Plant

The intent of the Specification is that the Plant and/or the Works shall be designed, manufactured, supplied, installed and constructed such as to be fit for the purpose of providing Passenger Lift service in compliance with BS EN81-20 and BS EN81-50 requirements; the Lifts Regulations 2016 as amended; Fire Fighting Lift Service to BS EN81-72 requirements; Fire Recall Service to BS EN81-73 requirements.

The Plant shall have a minimum service life of not less than 20-years commencing from Taking Over by the Purchaser.

The lifts are to be installed within the existing lift shafts.

The technical details of the lifts to be provided are indicated in Part 6 of this Specification.

In the case of any disparity between this Specification and any other Contract documents or drawings this is to be notified immediately to the Engineer.

Form of Contract

The Terms of the Contract will be in accordance with the Form of Contract, Preliminaries & General Conditions issued with this Specification and/or detailed in the covering letter.

Site Conditions

The site is situated at 1 Mann Island, Liverpool, L3 1DP.

Site Storage

The lift contractor shall allow for a 20' x 8' lockable storage container within their submission.

Site Management Costs

The Lift Contractor shall appoint a Project Manager/Supervisor who can demonstrate an appropriate level of competence in terms of the work involved as to ensure the effective and safe and efficient management of the Works and the satisfactory progress of these. The Lift Contractor's appointed Project Manager/Supervisor shall be fully conversant with accepted lift industry work practices and safety requirements, the requirements of the CDM Regulations 2015, labour management, and in relation to the management and control of Works of a similar extent and nature.

The CDM 2015 Regulations require that a Principal Contractor shall take full responsibility for managing the site works.

For the avoidance of doubt, the Lift Contractor shall undertake the role and duties of Principal Contractor.

The Lift Contractor shall cooperate fully with the Principal Contractor and Principal Designer including the prompt provision of all design information, and information required for the preparation of the Construction Phase Plan, and for the Health and Safety File.

The Lift Contractor shall include for site management costs which shall include for the CDM 2015 related responsibilities.

Drawings, Specification, Orders and other Particulars

This Specification shall be read in conjunction with the Schedules, Specification and Contract Documentation such that these are construed as a whole, and the Lift Contractor shall carry out the works accordingly.

The Lift Contractor will be held responsible for the works embodied therein and shall take all necessary particulars and provide, at their own expense, all other necessary work and detailed drawings of equipment specified or to be supplied, copies of which must be submitted for approval prior to the work being put into hand. Other drawings to be provided by the Lift Contractor are set out in Section 5 of this Specification.

The Lift Contractor shall be responsible for any drawings, specifications, orders or other particulars supplied by them and for any discrepancies, errors or omissions in these.

Hours of Work

The hours of work will be as shown on the Schedule of Site Works incorporated into the Contract. No additional working hours will be allowed except by agreement of the Engineer.

Equipment and Materials

The Specification provides for the installation of 4 No. passenger lifts which are to be designed, manufactured, constructed, supplied and installed together with all of the associated works necessary, commencing from the electrical mains supply within the lift shaft, all in accordance with the requirements of this Specification, whether specifically mentioned, inferred or otherwise, together with the remedying of defects during the Maintenance period as provided herein.

The Lift Contractor shall base their Tender on the materials and manufacturers as detailed in Section 4 of this Specification. Where materials and manufacturers have not been specified the materials shall be of the highest possible grades of their respective kinds and shall conform to the relevant British Standard for such materials.

All unspecified materials proposed for use by the Lift Contractor must be approved by the Client's Representative.

Sample & Other Testing

The Lift Contractor shall provide samples, as the Engineer may require, of any or all materials and workmanship to be used on the Works.

The Lift Contractor shall bear the cost of providing samples and any testing of such samples of material which the Engineer may direct the Lift Contractor to arrange to be undertaken.

Any material or equipment which fails to meet the tests applied shall be replaced, 'free of charge', by the Lift Contractor, using a suitable alternative material or equipment which has first been approved by the Engineer.

Maintenance Period

The Maintenance Period for all the lifts current and new shall commence on the first of September 2025 and will end at the date of Practical Completion of each lift and shall continue for a period of 24 months thereafter after the last lift is completed and witness tested.

If, during the Maintenance Period, any defects or faults develop which are due to faulty materials, components, workmanship, or design, then the Contractor shall replace these at their own expense on the new lifts, and to Mersey Travel on any of the current lifts.The Lift Contractor shall include for providing full instruction and training as to the operation of the lift/s to the Purchaser's appointed staff.

Site Waste Management

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

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

Target Programme

It is likely that the Lift Contractor will be appointed by June 2025 with site installation works commencing by December 2025. Site installation is expected to take in the region of 64 weeks.

Abbreviations

The following abbreviations have been used:

BS	British Standards Specification
BSI	British Standards Institute
dBA	Decibels
FFL	Finished floor level
kg	kilograms
kW	kilowatts
m	metres
mA	milliamps
mg	milligram
mm	millimetres
No.	Number
SWG	Standard Wire Gauge (Imperial)

1.2 Quality and Tolerances

Regulations and Quality of Work

The Lift Contractor should refer to the Tender Documentation and the relevant clauses within this Specification.

The completed installation shall comply, in all respects, with the provisions of the latest editions of the following British Standards, including Draft Standards as follows:

a)	BS 476	Fire tests on building materials
b)	BS 5499	Fire safety signs
c)	BS 5655	Lifts & Service Lifts Parts 1 – 14 inclusive, where relevant
d)	BS 7255	Safe Working on Lifts
e)	BS 7671	The IET Wiring Regulations
f)	BS 7980	Vehicle Lifts – Installation, maintenance, thorough examination and safe use – Code of practice
g)	BS 8300-1 & 2	Design of Buildings to meet the needs of the Disabled
h)	BS 8486 -9	Examination and test of new lifts before putting into service. Specification for means of determining compliance with BS EN 81. Lift features for emergency recall conforming to BS EN 81-73
i)	BS 8486-1 & 2	Examination & Test of New Lifts before putting into service. Specification for means of determining compliance with BS EN81-1/2
j)	BS 8486-3	Examination and test of new lifts before putting into service - Specification for means of determining compliance with BS EN 81 - Part 3: Passenger and goods passenger lifts conforming to BS EN 81-20
k)	BS 8486-4	Examination and test of new lifts before putting into service - Specification for means of determining compliance with BS EN 81 - Part 4: Passenger and goods passenger lifts conforming to BS EN 81-21
l)	BS 8486-5	Examination and test of new lifts before putting into service - Specification for means of determining compliance with BS EN 81 - Part 5: Lift alarm systems conforming to BS EN 81-28
m)	BS 8486-6	Examination and test of new lifts before putting into service - Specification for means of determining compliance with BS EN 81 - Part 6: Lift features for accessibility conforming to BS EN 81-70
n)	BS 8486-7	Examination and test of new lifts before putting into service - Specification for means of determining compliance with BS EN 81 - Part 7: Lift features for vandal-resistance conforming to BS EN 81-71

o)	BS 8486-8	Examination and test of new lifts before putting into service. Specification for means of determining compliance with BS EN 81. Lift features for firefighting conforming to BS EN 81-72
p)	BS 8899	Code of Practice – Improvement of Firefighting & Evacuation Provisions in Existing Lifts
q)	BS 9999	Fire Safety in the Design and Use of Buildings
r)	BS EN 12015	Electromagnetic Compatibility - Product Family Standard for Lifts, Escalators & Moving Walks – Emission
s)	BS EN 12016	Electromagnetic Compatibility - Product Family Standard for Lifts, Escalators & Moving Walks – Immunity
t)	BS EN 12385-4&-5	Steel Wire Ropes
u)	BS EN 13015	Maintenance for Lifts & Escalators – Rules for Maintenance Instructions
v)	BS EN 1493	Vehicle Lifts
w)	BS EN 50525-1	Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V. General requirements
x)	BS EN 50525-2	Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V. Cables for general applications. (All Parts)
y)	BS EN 50525-3	Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V. Cables with special fire performance. Cables with halogen-free, and low emission of smoke. (All Parts)
z)	BS EN 60332-1&-2	Tests on Electric Cables under Fire Conditions
aa)	BS EN 61111	Live working — Electrical insulating matting
bb)	BS EN 81-1	Electric Lifts
cc)	BS EN 81-2	Hydraulic Lifts
dd)	BS EN 81-20	Lifts for the Transport of Persons & Goods – Part 20: Passenger and Goods Passenger Lifts
ee)	BS EN 81-21	New Passenger & Goods Passenger Lifts in Existing Buildings
ff)	BS EN 81-22	Electric Lifts with Incline Path
gg)	BS EN 81-28	Remote Alarm on Passenger & Goods Passenger Lifts
hh)	BS EN 81-3	Electric & Hydraulic Service Lifts
ii)	BS EN 81-31	Accessible Goods Only Lifts
jj)	BS EN 81-40	Stairlifts & Inclined Lifting Platforms Intended for Use by Persons with Impaired Mobility
kk)	BS EN 81-41	Vertical Lifting Platforms Intended for Use by Persons with Impaired Mobility
ll)	BS EN 81-50	Examinations & Tests – Part 50: Design Rules, Calculations, Examinations & Tests of Lift Components

mm)	BS EN 81-58	Examinations & Tests – Part 58: Landing Door Fire Resistance Test
nn)	BS EN 81-70	Accessibility to lifts for persons including persons with disability
oo)	BS EN 81-71	Vandal Resistant Lifts
pp)	BS EN 81-72	Firefighters lifts
qq)	BS EN 81-73	Behaviour of Lifts in the Event of Fire
rr)	BS EN 81-77	Lifts Subject to Seismic Conditions
ss)	BS EN 81-80	Rules for the improvement of safety of existing passenger and goods lifts
tt)	BS EN 81-82	Improvement of Accessibility of Existing Lifts for Persons Including Persons with Disability
uu)	BS EN ISO 13857	Safety of Machinery – Safety Distances to Prevent Danger Zones Being Reached by the Upper & Lower Limbs
vv)	BS EN ISO 14120	General Requirements for the Design & Construction of Fixed & Moveable Guards
ww)	BS EN ISO 14798	Risk Assessment & Reduction Methodology
xx)	BS EN ISO 16032	Acoustics – Measurement of Sound Pressure Levels from Service Equipment in Buildings
yy)	BS EN ISO 25745	Energy Performance of Lifts, Escalators & Moving Walks (All Parts)
zz)	BS ISO 22201	Programmable Electronic Systems in Safety Related Applications (All Parts)
aaa)	BS ISO 4190	Lift (Elevator) Installation (All Parts)
bbb)	BS ISO 8100-1	Lifts for the Transport of Persons & Goods – Part 1: Passenger and Goods Passenger Lifts
ccc)	BS ISO 8100-2	Lifts for the Transport of Persons & Goods – Part 2: Design Rules, Calculations, Examinations & Tests of Lift Components
ddd)	BS ISO 8100-30	Lifts for the Transport of Persons & Goods- Part 30: Class I, II, III, and VI lifts installations
eee)	BS ISO 8100-34	Measurement of Lift Ride Quality
fff)	BS ISO 8102-1	Electrical requirements for lifts, escalators and moving walks -- Part 1: Electromagnetic compatibility with regard to emission
ggg)	BS ISO 8102-2	Electrical requirements for lifts, escalators and moving walks - Part 2: Electromagnetic compatibility with regard to immunity
hhh)	BS ISO 8102-6	Electrical requirements for lifts, escalators and moving walks - Part 6: Programmable electronic systems in safety-related applications for escalators and moving walks (PESSRAE)
iii)	BS ISO 8102-20	Electrical requirements for lifts, escalators and moving walks - Part 20: Cybersecurity
jjj)	DD 222	Specification for Rack & Pinion Lifts

kkk)	DD CEN/TS 81-76	Evacuation of Disabled Persons Using Lifts
lll)	DD CEN/TS 81-83	Existing Lifts. Rules for the Improvement of Resistance Against Vandalism
mmm)	EN 12600	Glass in Building – Pendulum Test – Impact Test Method & Classification for Flat Glass
nnn)	EN 131-2	Ladders – Requirements, Testing, Marking
ooo)	EN 14122-1-4	Permanent Means of Access to Machinery: Parts 1 to 4
ppp)	EN 1570-1	Lifting Tables Serving Up to Two Levels
qqq)	EN 1993-1-1	Eurocode 3 – Design of Steel Structures – Part 1-1: General Rules and Rules for Buildings
rrr)	EN 60068-2-14	Environmental Testing – Part 14: Tests – Test N. Change of Temperature
sss)	EN 60112	Method for the determination of the proof & the Comparative Tracking Indices of Solid Insulating Materials
ttt)	EN 60529	Degrees of Protection Provided by Enclosures (IP Code)
uuu)	EN 61800-5-2	Adjustable Speed Electrical Power Drive Systems – Part 2: Safety Requirements. Functional
vvv)	EN 61810-1	Electromechanical Elementary Relays – Part 1: General Requirements
www)	EN 14122-1-4	Permanent Means of Access to Machinery: Parts 1 to 4
xxx)	HD 60364-6	Low-voltage Electrical Installations – Part 6: Verification
yyy)	ISO 1219-1	Fluid Power Systems and Components – Graphic Symbols and Circuit Diagrams – Part 1: Graphic Symbols for Conventional Use & Data-processing Applications
zzz)	PD ISO/TS 18870	Requirements for Lifts Used to Assist in Building Evacuation

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

a) Building Safety Act 2022
b) The Construction (Lifting Operations) Regulations
c) The Construction (General Conditions) Regulations
d) The Construction (Health & Safety) Regulations
e) The Construction (Work in Places) Regulations
f) The Construction Products Regulations
g) The Factories Act and all amendments thereto
h) Health & Safety at Work Act
i) The Electricity at Work Act
j) The Fire Safety (England) Regulations 2022
k) The Management of Health & Safety at Work Regulations 1999
l) The Provision and Use of Work Equipment Regulations 1998

m) The Workplace (Health, Safety & Welfare) Regulations 1992

n) The Construction (Design & Management) Regulations 2015

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

p) The Supply of Machinery (Safety) Regulations 2008 as amended.

q) The Lifts Regulations 1997 as amended.

r) The Lifts Regulations 2016 as amended.

s) The Lifting Operations and Lifting Equipment Regulations 1998 as amended.

t) The Building Regulations Part M2 and subsequent updates

u) The Health & Safety (First Aid) Regulations 1981

v) The Work at Height Regulations 2005

w) The Control of Noise at Work Regulations 2005

x) The Control of Asbestos Regulations 2012

y) The Waste Electrical and Electronic Equipment Regulations 2013 as amended 2018

z) The Environmental Protection Act 1990

aa) The Environmental Protection (Duty of Care) Regulations 1991

bb) The Environment Act 1995

cc) The Equality Act 2010

dd) NHS Health Technical Memorandum HTM08-02 Lifts 2016

ee) The Welsh Language (Wales) Measure 2011 & associated Standards

Site Inspection

The Lift Contractor shall be deemed to have satisfied themselves as to the local conditions with regard to accessibility of the site; as to the full extent and nature of the Works; as to the supply of and conditions affecting labour; as to provisions for messing, toilets, carriage, cartage, unloading, tools, accommodations, scaffolding, hoisting, cranage, ladders, and anything other which may influence their Tender or them carrying out the Works. A site inspection visit can be arranged if required.

Component Life

All major components, including but not limited to, contactors, relays, push units, indicators, call-accepted indicators, door operators, door interlocks, shaft switches and associated equipment, components and materials shall have been type tested to a minimum of 1 million operations.

The Lift Contractor shall state the expected life of solid-state components.

1.3 Refurbishment Notice

The Lift Contractor shall include in their Tender costs for the provision of two Notice/Sample Boards which will illustrate, by means of a colour perspective detail drawing of the lift car interiors, and samples of materials, finishes and fixtures, along with a brief description of the Works including approximate time scales.

The Lift Contractor shall site these boards in a location within the site which is agreed with the Purchaser.

Each board shall be of minimum size 1500 mm x 1500 mm and shall be self-supporting.

SECTION 2

CDM REGULATIONS 2015

2 CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS

2.1 General

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 they have 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 they may make in their capacity as Main Contractor or Construction Manager include provisions for the compliance of their trade or sub-contractors, suppliers and Designers with the relevant provisions of the CDM Regulations.

2.2 Pre-Tender Construction Information

2.2.1 CDM 2015 Duty Holders

Client:		**Mersey Travel**
	Address:	**1 Mann Island** **Liverpool** **L3 1DP**
Principal Designer:		TÜV SÜD
	Address:	Office 12, Building 3 Clock Tower Park Longmoor Lane Liverpool L10 1LD
	Contact Name:	John Whewell
	Tel:	07971 149513
Designers:		[The Appointed Lift Contractor]
Principal Contractor:		[The Appointed Lift Contractor]
Contractors:		[Any sub-contractors appointed by the Lift Contractor]

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.

2.2.2 The Project

The Project comprises of removal of the majority of the existing lift equipment and replacing the equipment with 4 x machine room-less design passenger lifts one of which is a designated firefighting lift, and another is a designated evacuation lift.

The Project will also include all associated Builders & Electrical Works.

2.2.3 The Existing Environment

The property comprises of commercial office accommodation on multiple floors, which are currently occupied and will be for the duration of lift replacement project. The appointed Lift Contractor (including any appointed sub-contractors) must adhere to all Health & Safety procedures associated with undertaking this type of work in an occupied environment.

Entrances to the property are on lower ground car park and ground floor levels.

Fire access floor for Fire Rescue Service (FRS) is at the ground level.

The building is served by a 4-car group of passenger lifts serving various floors of the building. All lifts do not serve all floors of the building, and the system utilises a destination control system. The lifts are installed at the building main entrance.

The lifts open on to landings incorporating a staircase on all floors. Hoardings for removal of landing doors will need to be robust, fire resistant, secure and not impede access and egress from doorways and adjacent operational lifts.

During the course of the Works, it is not anticipated that any other Contractors will require access to the lift other than those under this Contract. The Lift Contractor shall be responsible for securing the work area and maintaining a Permit to Work system.

The property will remain occupied during the course of the Works and the appointed Lift Contractor (including any appointed sub-contractors) must adhere to all Health & Safety procedures associated with undertaking this type of work in an occupied environment.

2.2.4 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, lift installations 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.

2.2.5 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.

2.2.6 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 it, the Environmental Protection Act 1990 (EPA), and the CDM Regulations 2015.

2.2.7 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) Can 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 CFCs 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

2.2.8 Deleterious Materials

No materials 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

Or, 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 in order to ensure that any product does not contain such material. Any products and/or materials found to contravene this requirement shall be removed and replaced by the Lift Contractor at their own expense.

2.2.9 Anticipated Target Programme/Key Dates

The programme will be agreed between the Lift Contractor and the Purchaser in order to minimise inconvenience. It is anticipated that the Works will be completed in four phases of one lift.

The Lift Contractor shall confirm with their Tender the best possible material procurement/delivery periods and installation times which they are able to achieve.

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

Return of Tenders	July 2025
Purchaser order to Lift Contractor:	August 2025
Initial Lift Contractor's design and production of drawings:	October 2025
Lift Contractor's completion of Construction Phase H&S Plan:	4 weeks prior to start on site
Delivery of materials and start site works:	December 2025
Completion of works:	March 2027

The Extent and Location of Existing Records & Plans

No architectural/structural drawings are available relating to the lift well or lift motor room. The Lift Contractor is therefore required to undertake their 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). The Lift Contractor shall visit the site and ascertain for themselves the nature and extent of the Works and the conditions under which these are to be executed.

No claim by the Lift Contractor for additional payment shall be allowed on the grounds that they 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, setting out and construction drawings for the refurbished lifts as part of the Project and as detailed within the Specification together with any additional drawings required for any authorising body.

2.3 Client's Considerations & Management Requirements

2.3.1 Planning & Management of the Construction Works

The Client has appointed TÜV SÜD, who are Lift Consultants experienced in the design, specification and management of lift installation and replacement works, to prepare a Performance Specification and undertake the management of the Project.

Key safety goals include:

- No safety related incidents
- No accidents to employees, residents, contractors, subcontractors or members of the public
- 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 as amended and Designated Standards BS EN81-20 & 50: 2014; and BS EN81-70: 2003
- Handover of a Health & Safety File comprising a complete set of CDM 2015, Design and O&M documentation to the Client on completion of the Works

2.3.2 Communication & Liaison between the Client & Others

The Lift Contractor and their sub-contractors shall, at all times, comply with the agreed Health & Safety procedures and particular those which directly affect the Health & Safety of personnel throughout the installation period of the Contract. Any additional requirements with respect to emergency procedures and associated requirements are to be discussed/agreed with the Principal Designer and Engineer prior to the commencement of site works.

Method Statements and continuing re-evaluation of work sequences will be required and must be properly implemented by the Lift Contractor. Changes and revisions are to be recorded and/or minuted, and the Construction Phase Safety Plan amended accordingly, during the installation period.

Where unforeseen events may occur during the site works the Lift Contractor shall provide a suitable Safe System of Work which can be implemented to meet the requirements and circumstances of any design change, including assessments of all hazards involved and the necessary communication and liaison required to minimise the effect of these, 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, although the actual timing of such meetings shall be as required by the Engineer.

The Lift Contractor is responsible for ensuring that all of their engineers, operatives and sub-contractors are fully trained and made conversant with the required Health & Safety procedures and requirements, prior to commencement of any operations on site. A Register of Inductions and Toolbox Talks shall be included in the Construction Phase Safety Plan.

2.3.3 Overlap with Clients' Undertaking

The premises will remain occupied during the course of the works on site. The Lift Contractor shall ensure therefore that their engineers and operatives are aware of the requirements for safe access and the 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 will be held liable for any damage resulting due to any cause within theirs or their sub-contractor's control which is occasioned to any service or marker and shall be held responsible for any costs or charges 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, shall be kept to a minimum. If necessary, these activities are to be undertaken outside of the normal working hours of the building. Sufficient controls or working methods shall be applied in order to ensure that the risks (of exposure to high noise levels) to the Lift Contractor's 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 generation cannot be avoided must be agreed with the Engineer prior to commencement.

At no time will the use of personal radios be permitted.

The Lift Contractor shall include 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 which are not affected by the Works.

2.3.4 Security of the Site

The element of the construction site, comprising the lift well and entrances, shall be secured behind robust protective fire-resistant hoardings, which are to be securely fixed to the structure of the building. These shall be checked daily by the Lift Contractor.

The access to the site shall be via the ground floor entrance at times agreed with the Engineer. **All** protection to finishes and personnel routes shall be the responsibility of the Lift Contractor. Floor surfaces at each level shall be protected using 'Cordex' or equal approved hazard tape in order to avoid tripping hazards.

The Lift Contractor shall safeguard the Works, materials and plant against damage, theft or vandalism, including the provision of all necessary lighting for the security of the Works and the protection of the Public.

The Lift Contractor shall provide for carefully covering up and protecting all fixed or unfixed items of equipment throughout the duration of the Works until Taking-Over. Any equipment which has become tarnished, corroded, degraded, or damaged in any way whatsoever, will not be accepted and shall be replaced by the Lift Contractor at their own cost.

The Lift Contractor shall provide for removing all rubbish from the site, both as this 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 damage or disruption arising as a result of the foregoing shall be made good. All packing cases and packing material shall be removed from site immediately the contents have been unpacked. All waste and/or redundant 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 Lift Contractor shall fully reinstate the site to its original condition.

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

The Lift Contractor shall ensure that all Portable Appliances used at or brought to the site shall be tested and marked in compliance with current Regulations.

The Lift Contractor shall ensure that all lifting equipment, including tackles and slings, is tested and marked in accordance with current Regulations.

The Lift Contractor shall ensure that all scaffolding is correctly installed to current Regulations, with installation and/or modifications, adjustments or adaptation, undertaken by authorised personnel only. Scaffolds shall be Inspected and Tagged, and a register shall be retained on site.

The Lift Contractor shall issue to, or arrange for, their employees and sub-contractors to be provided with photographic ID Cards which are to be designed to the Engineer's approval. These are to remain valid for the duration of the Works and are to be carried at all times. Entry to the premises will be refused if a valid pass cannot be produced.

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

2.3.5 Welfare Provision

Access to welfare provisions including, toilets and washing facilities, will be provided by the Purchaser on the basis that these are treated with respect and maintained in a clean and acceptable condition. It is a prerequisite that employees remove overalls prior to entering these areas.

Details of welfare restrictions will be discussed at the pre-start meeting.

2.3.6 Site Hoarding Requirements

The Lift Contractor shall install robust fire-resistant protective hoardings the design and construction of which is to be as detailed elsewhere in this Specification.

Entrance protection shall be provided by the Lift Contractor in accordance with Section 3 of this Specification.

It is imperative that any protective hoarding, barrier and work screen is maintained in a sound and secure condition at all times. Access doors are to be kept securely locked excepting for when the Lift Contractor's engineers or Sub-contractors are working in the immediate vicinity.

2.3.7 Site Transport Arrangements & Vehicle Movement Restrictions

The Lift Contractor's attention is drawn to the requirement that they are to restrict the flow of vehicles to times as agreed with the Engineer, and must allow in their Tender, for all necessary precautions necessary to protect the occupants of the premises and the members of the public, and to maintain access at all times.

The only form of site transport envisaged is that of delivery vehicles to the exterior area of the building and small handling trolleys within the building.

Delivery of large assemblies or components shall be coordinated with the Engineer. The Lift Contractor shall, at all times, supervise offloading and vehicle movements which are to be undertaken during periods of low use of the areas involved.

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. The Lift Contractor shall include for all costs and charges for complying with all other regulations and directions, including obtaining permissions in relation to any road closure, cranes, etc.

2.3.8 Client Permit to Work System

The Client does operate a Permit to Work system at the premises. However, the Lift 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 their own safe working system.

2.3.9 Fire Precautions

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

Only the Lift Contractor's employees or sub-contractors who have been properly trained in the use of such equipment shall be permitted to use such equipment. The Lift Contractor shall ensure that proper safety precautions, in compliance with good practice and statutory requirements, are applied and maintained for the duration of the use of the equipment.

Should the Lift Contractor or their sub-contractors have a requirement to use either oxyacetylene or electrical welding equipment on site the Lift Contractor shall first seek the permission of the Engineer, who will not unreasonably withhold such permission.

The Lift Contractor shall include all necessary equipment to control fumes and smoke generated by such operations.

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

2.3.10 Emergency Procedures & Means of Escape

Emergency procedures, means of escape and first aid facilities (which shall meet the requirements of The Health & Safety (First Aid) Regulations 1981), will be reviewed at the Pre-Start Meeting.

2.3.11 No-go areas & other specific authorisation requirements

Due to the limited space available the Lift Contractor is required to limit their area of operations to the lift shafts and any hoarded area of the landings.

The Lift Contractor's normal access areas will be limited to the lift shafts, entrance lobbies and immediate staircase, as well as agree welfare and washroom facilities. All operatives shall restrict their access to the generally agreed site access and work areas.

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

2.3.12 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 Lift Contractor shall establish a Safe System of Work together with provisions for communication and rescue.

2.3.13 Site Rules & Discipline

The Lift Contractor shall comply with the Client's Building Rules which are appended to the Specification and discussed at the pre-start meeting. The building is a stay put building for tenants in

event of fire. It is envisaged that lift engineers fire muster point will be on the paved area outside the main building entrance.

The Lift Contractor shall, at all times, ensure that their 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.

2.3.14 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.

2.3.15 Training and Competence

All persons working on a lift/escalator or related equipment, including within a well, machinery space, pulley room or lift lobby shall possess demonstrable competence to an appropriate standard as defined in BS 7255 and the requirements below or be under relevant supervision.

Persons installing, maintaining, and repairing lifts/escalators shall be qualified to at least Level 3 NVQ in Installation & Commissioning of the appropriate equipment type and be suitably trained on the specific products they are working on.

Persons testing lifts/escalators shall be suitably trained on the specific products they are working on and be qualified to at least Level 4 NVQ in Performing Testing Operations in the Lift and Escalator Industry.

Evidence of demonstrable competence to the appropriate level shall be available on request and shall be submitted to the Engineer prior to the personnel commencing on site.

2.3.16 Parking Restrictions

Parking for one vehicle will be made available for the duration of the contract.

2.4 Environmental Restrictions & Existing On-Site Risks

2.4.1 Safety Hazards

Known potential existing safety hazards and environmental restrictions which are to be taken into account and addressed by the Lift Contractor in their Construction Phase H&S Plan include the following:

- Loading, off-loading and distribution of materials will be undertaken in areas accessible to site visitors/members of the public.
- Limited space is available for vehicle manoeuvring and turning of vehicles.
- Limited storage space is available, and redundant materials are to be removed on a daily basis.

2.4.2 Health Hazards

Contaminated Land

The Lift Contractor shall observe the environmental controls detailed in The Contaminated Land (England) Regulations 2000 as enforced by the Environment Agency or Local Authority and seek specialist advice before commencing work.

Asbestos

As the building was constructed post 2000 there is no requirement for an asbestos survey.

2.4.3 Significant Design & Construction Hazards

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

The lift design shall be in compliance with the Designated Standards BS EN81-20 and BS EN81-50 providing an assumption of compliance with the Essential Health & Safety Requirements of the Lifts Regulations 2016 as amended. The lift shall be subject to witness test in line with BS 8486 Standard on completion.

The lift installation method is proprietary to the Lift Contractor and detailed installation Method Statements, Risk Assessments and layout drawings shall be provided by the Lift Contractor. These shall be incorporated into the Construction Phase Plan.

The removal of the existing lift shall be undertaken by the Lift 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, applying a double set of tested lifting equipment each of which is suitably de-rated by 50% of SWL, from the existing lifting beam, which shall be tested prior to use. The lift car may then be utilized as a working platform to dismantle equipment in the upper section of the lift well and lower this into the pit area for dismantling and removal from site via the ground property entrance. A 2-person Banksman & signaller arrangement will need to be utilized to ensure same manoeuvring of large cumbersome equipment.

Comprehensive and detailed Safe Systems of Work, Method Statements, Risk Assessments and Control Measures are to be provided and agreed with the Principal Designer/Engineer prior to commencement.

The associated builders and electrical work shall be undertaken by the Lift 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 Lift Contractor shall provide

comprehensive and detailed Safe Systems of Work, Method Statements and Risk Assessments for all builder's and electrical works tasks.

2.4.4 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 channelled 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.

2.4.5 Information on Significant Risks Identified During Design

- Refer to the Lift Contractors Design Risk Assessment for compliance with the Lifts Regulations 2016 as amended.
- Refer to following TÜV SÜD indicative risk assessments.

2.5 Principal Contractor Construction Phase Plan Development

The Lift Contractor shall develop the 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 commencement of any works.

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

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

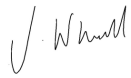
2.6 The Health & Safety File

The Health & Safety File shall be produced in accordance with the CDM 2015 Regulations and the Guidance provided by HSE. Relevant information obtained from the Lift Contractor, Designers, Contractors and other parties during the course of the Project shall be collated by the Principal Designer for issue to the Client on completion of the Project.

In order to produce the file, the Principal Designer requires the cooperation of the Lift Contractor and other Designers and Contractors who shall provide information expeditiously, and whenever required, throughout the course of the Project. In particular the Operating and Maintenance Manuals, which are detailed later in this Specification, these are to be provided at the latest by the date of Taking-Over, accepting that the final installation Test Certificates may not be available until completion of Witness Tests.

The information to be included must be specific to those Health and Safety issues relevant to the Project and Works and shall cover the whole installation life cycle including development, maintenance and subsequent demolition.

TÜV SÜD RISK ASSESSMENTS
(BASED UPON DD ISO 14798:2013)

LIFT SPECIFICATION RISK DOCUMENTATION			Document No. LSRD
Contract Name: Mersey Travel, Mann Island			NOTE: The hazards identified should not be considered to be an exhaustive list. You are also advised to make reference to BS EN81-80 for significant hazards associated with existing lift installations and implement appropriate control measures. 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.
Lift Identity & Location: 4-Car Group DCS Refurbishment			
Assessment conducted by: JOHN WHEWELL	Signed: 	Date: 27.09.2024	

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 BS EN61111 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

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 safely handled. Safety footwear to BS EN ISO 20345 and protective Kevlar or rigger gloves must be worn.	2	2	4 = **L**	*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*
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*

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
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. Any floor protection to be taped in place. All deliveries to be co-ordinated with the Engineer/Purchaser.	3	2	6 = **M**	*Acceptable 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. (BS IEC 60479-1refer). 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*
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*
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*

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
MR2	Working in Machinery Area	Danger of injury by unguarded machinery.	3	3	9 = **M**	**E** **CO**	Motor room and lift shaft to be kept locked. Lift Contractor to paint all moving parts safety yellow and provide guarding in accordance with Machinery Directive and PUWER Regulations. A remote gear isolation switch should be fitted to act as an emergency stop whilst working near unguarded sheaves or ropes.	2	2	4 = **L**	*Guarding could be inadequate or have been removed*

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 <u>WORK MUST STOP</u>

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

TÜV SÜD – HAZARD IDENTIFICATION CHECKLIST			
JOB NO:	N. Y2400089	DATE:	27.09.2024
PROJECT:	MERSEY TRAVEL, MANN ISLAND	ACTIVITY:	4-Group DCS Refurbishment

(To be read in conjunction with Risk Analysis Sheets) ✓

Activity	HAZARD (tick off relevant hazards)													
	Radiation Chemical & Metal Splash	Confined spaces	Fall From Ht.	Struck by Mobile Plant	Trip	Collapse	Manual Handling	Moving Object	Electricity	Contact with moving machine	Fire	Hazardous Sub-stance	Noise & Vibs	Expln.
LIFTS														
- New Installation														
- Modify Existing		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
- Removal of Existing		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Builders Works		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Electrical Works		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Asbestos Removal														

Signed: J. Whewell ---------- **Name:** JOHN WHEWELL ----------

SECTION 3

SCHEDULE OF BUILDERS WORK

3 SCHEDULE OF BUILDERS WORK

3.1 Builders and Associated Electrical Works – Firefighters Lifts – D LIFT ONLY

In **addition** to the general provisions of this Specification, the following shall be provided and apply to the Firefighters Lifts.

General

Firefighters' lifts shall be installed in accordance with the requirements of BS EN81-72, BS9999, BS EN81-20 and BS EN81-50, together with UK Building Regulation requirements.

Electrical Main Supply

Two electrical supplies shall be provided in relation to the Firefighters Lift: The Primary supply, which shall be obtained from a sub-main exclusive to the lift and independent of any other main or sub-main. The Secondary supply which shall be of sufficient capacity to maintain in operation: • The Fighters lift. • Normal lighting and shaft lighting within the Firefighting shaft. • The Firefighters lift communication system. • Any mechanical ventilation or pressurisation system which operates in conjunction with the operational use of the Firefighting shaft. • Any pumps installed in the lift pit. • Any pumps required to feed the fire main.	**Client**
The electrical supply cables supplying the Firefighters lift shall be installed in accordance with BS7671 the IET Wiring Regulations and shall be routed in a protected route, which may include the Fire Fighting lift shaft.	**Client**
The Primary and Secondary supplies shall be terminated in a changeover device which shall be located within the Firefighters lift shaft or motor room, and which shall automatically affect a transition from Primary to Secondary supply if any phase of the Primary supply should fail.	**Client**
'ASCO' or equal to the approval of the Engineer shall provide this device.	**Client**
The supply changeover device shall have outputs to indicate which supply is in use, and which shall be electrically connected to the indicator within the Lift Contractor's Firefighters Lift Recall Switch faceplate provided at the Fire Service Access Level, adjacent to the lift entrance.	**Client**

Shaft Lighting

The lift shaft lighting fittings shall be of the low energy LED bulkhead type and shall be protected to IPX3 rating and shall be located 500 mm from the top of the lift shaft, and at least 500 mm above the level of the highest permissible water level in the lift pit. The lighting shall be designed, constructed and installed in accordance with the requirements of BS EN81-72, BS EN81-20 and equ-spaced through the lift shaft such as to provide the minimum levels of illumination prescribed in BS EN81-20. The electrical wiring shall be run in galvanised conduit separate from the lift wiring.	

Three-way switching shall be provided such that the shaft lighting can be controlled from the lift machine room/machinery spaces, lift car top and from the lift shaft pit. The shaft light switch in the lift pit shall be readily accessible from the landing and shall be located within 0.75 m of the inner edge of the landing entrance door frame and at a height not less than 1.0 m above the landing sill level. The shaft lighting shall be activated automatically during Firefighters operation mode. The lighting shall derive its supply from the consumer unit in the lift motor room/machinery space and shall be safeguarded such as to ensure its failure does not lead to the failure of any other component. The light fittings at the top of the shaft and in the pit area shall each incorporate an emergency light facility, with an alternative power source derived from an auto-recharge unit fitted with nickel-cadmium cells. These units shall have a minimum duration of 3 hours and a maximum recharge time of 12 hours and shall be in full compliance with the requirements of BS COP BS5266-1.	**Lift Contractor**

Pit Socket Outlets

The lift pit electrical socket outlet within the lift shaft shall be located and at least 500 mm above the level of the highest permissible water level in the lift pit and shall and shall be protected to IPX3 rating. The pit electrical socket outlet shall derive its supply from the consumer unit in the lift motor room/machinery space and shall be safeguarded such as to ensure its failure does not lead to the failure of any other component.	**Lift Contractor**

3.2 Builders and Associated Electrical Works – Evacuation Lifts – C LIFT ONLY

In **addition** to the general provisions of this Specification, the following shall be provided and apply to the Evacuation Lifts.

General

Evacuation lifts shall be installed in accordance with the requirements of BS9999, BS EN81-20, BS EN81-50, BS EN81-70, BS EN 81-73, and DD CEN/TS 81-76 together with UK Building Regulation requirements.

Lift Machine Room/Machinery Spaces

The lift machine room and/or machinery space shall not house or include any equipment other than that directly associated with the Evacuation lift and shaft	**Lift Contractor**

Lift Shaft

The lift shaft shall be configured and constructed in full accordance with the requirements of BS9999 and BS EN81-72 and shall have a minimum fire resistance as specified by the Fire Engineer.	**Lift Contractor**
The lift landings shall be designed to prevent or to minimise the risk of water entering the Evacuation lift shaft as described in BS 9999 and BS EN81-72.	**Client**

Electrical Main Supply

Two electrical supplies shall be provided in relation to the Evacuation lift: The Primary supply, which shall be obtained from a sub-main exclusive to the lift and independent of any other main or sub-main. The Secondary supply which shall be of sufficient capacity to maintain in operation: • The Evacuation lift. • Normal lighting and shaft lighting within the Firefighting shaft. • The Evacuation communication system. • Any mechanical ventilation or pressurisation system which operates in conjunction with the operational use of the Firefighting shaft. • Any pumps installed in the lift pit. • Any pumps required to feed the fire main.	**Client**
The electrical supply cables supplying the Evacuation lift shall be installed in accordance with BS7671 the IET Wiring Regulations and shall be routed in a protected route, which may include the Evacuation lift shaft.	**Client**
The Primary and Secondary supplies shall be terminated in a changeover device which shall be located within the Evacuation lift shaft or motor room, and which shall automatically affect a transition from Primary to Secondary supply if any phase of the Primary supply should fail.	**Client**
The device shall have outputs to indicate which supply is in use, and which shall be electrically connected to the Fire Service Access level, adjacent to the lift entrance for incorporation in the indicator panel.	**Client**

Fire Alarm Interface

Provide a suitable interface with the fire alarm system, comprising a pair of 'volt free' contacts for the following signals per lift in a separate terminal box. • Primary and alternate recall to BS EN81-73 • Recall to MEEF • Suspension of Evacuation service	**Client**

Communication Systems

Provide a two-way communication system for interactive two-way speech communication, between the MEEF and the evacuation lift car whilst the lift is in evacuation mode.	**Lift Contractor**
Provide an emergency voice communication system to enable people on each level served to speak with those in charge of the evacuation and the relay this information to the person operating the evacuation lift.	**Client**

3.3 Schedule of Builders Work – ALL LIFTS

The work described in this section is to be provided by the Lift Contractor or their Sub-contractor and is to be included within the Tender price.

Attendances

Attendances as set out in the Preliminaries including: -

- Storage and accommodation.
- Temporary lighting and power.

Scaffold as required for the Lift Contractor's preferred method of discharging the Works. All scaffolding used is to be designed and installed in compliance with the requirements of BS EN12811: 2003, CITB TG20:13, the CDM Regulations 2015 and the Health & Safety at Work Act, together with any other Guidance, Regulation or Statutory requirement which may apply to the site and/or Works.

The scaffolding installation may be altered, modified, moved and or revised only by authorised and approved scaffolding operatives, and shall be inspected, tested and tagged periodically through the duration Works.

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, the Lift Contractor shall include for the preparation of, and any alteration to, the building fabric, which is required to accommodate the new lift equipment.

The redundant materials shall be disposed of by the Lift Contractor 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 their Tender.

Steelwork

The Lift Contractor shall dismantle any redundant steelwork and supply and install all necessary new steelwork which is, or may be, required to accommodate the new lift equipment within the lift machine room and lift shaft.

Fire Stopping

The Lift Contractor shall install suitable fire stopping, rated such as to provide a level of fire resistance equal to, or in excess of, the surrounding material.

Where required by the building's fire strategy or local authority requirements, the Lift Contractor shall utilise temporary firestopping where compartmentation is breached during the course of their works

The Lift Contractor shall install the fire stopping throughout the entire lift installation, including the lift machine room, pulley rooms, and lift shafts, such as may be required in order to meet LPC and Building Regulations Approved Document B requirements.

All fire stopping shall be certified to confirm compliance with the Building Regulations and each location shall be tagged with details of the installing contractor, fire rating, material used, and the date of installation.

3.4 Existing Equipment (Retained)

The Purchaser reserves the right to retain any of the existing equipment for use as spares for future maintenance.

Components/Assemblies which are to be retained by the Purchaser shall be identified by the Engineer and communicated to the Lift Contractor prior to commencement of the removal/dismantling. The Lift Contract shall arrange for the careful and diligent removal of these components/assemblies, free of damage and deterioration, and for these to be delivered to an identified area within the site after which these shall become the responsibility of the Purchase. Should the Lift Contractor be in any doubt as to which components/assemblies are to be retained they shall advise the Engineer who will provide clarification, and if necessary, clearly identify these by way of suitable marking prior to commencement of the removal/dismantling.

3.5 Existing Equipment (Maintenance)

As part of the removal/dismantling process the Lift Contractor shall retain all key parts of the existing equipment recovered from the first/early phases of the Works for use as spares in order to support maintenance of the equipment being retained during later or other phases of the Works.

The Lift Contractor shall provide a list of equipment which is to be retained and agree this with the Engineer prior to commencement of any removal/dismantling works.

3.6 Lifting Beams (Testing)

The existing lifting beams shall be tested by the Lift Contractor and a label affixed displaying the safe working load in compliance with the requirements of PUWER, LOLER and the Health & Safety at Work Act 1974.

3.7 Pit Ladder

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 and BS EN131-2 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.

3.7.1 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, and to the approval of the Engineer.

The Lift Contractor shall state at Section 9 of this Specification in the Technical Details of the Tender Return which of the ladder Type Designs they have included for in their 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.

3.8 Protective Screens on Landings (Full Hoardings)

The Lift Contractor shall provide sketch drawing of their 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.

3.9 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, which has been occasioned by the Works. These shall be reinstated in materials and or finishes which match 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 in relation to the decorative finishes to floors and walls around the lift landing entrances.

The extent of making good shall be defined for estimating purposes as the full front wall of the lift shaft from floor to ceiling up to 2 m from each architrave horizontally. This may be varied prior to commencement by mutual agreement between the Lift Contractor and Engineer.

3.10 Landing Fixture Apertures

The Lift Contractor shall include for cutting new apertures to accommodate the new landing pushes/indicators in the front wall.

The pushes shall be fixed at a height in compliance with Part M2 of the Building Regulations and the provisions of BS EN81-70 and BS8300.

The lift landing indicators shall be as detailed elsewhere in this Specification.

The Lift Contractor shall include for making good the existing apertures in an equivalent matching finish to the existing, and to the satisfaction of the Engineer.

3.11 Decommissioning and Removal of Lifts

The Lift Contractor shall include for all decommissioning and removal of the existing lift equipment. Except as otherwise stated in this Specification materials of any kind obtained from dismantling shall become the property of the Lift Contractor. The Lift Contractor shall dispose of such materials in a responsible manner, taking due regard of all relevant Legislation, but in all cases, shall remove the materials from the premises promptly, and as soon as dismantled, and at all times expeditiously and cleanly. The Lift Contractor shall include for all taxes and/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 which the Lift Contractor shall carefully remove and deliver to an agreed location within the premises for re-use by the Purchaser on other installations.

As part of the Works the Lift Contractor shall ensure that personnel have the appropriate skills and have received the correct safety induction and have available all of the necessary tools and plant, complete with required test certification, and all personal protective equipment necessary to undertake the work.

Wherever and whenever angle grinders and/or Oxy-propane cutting equipment, or other hot-works are used the Lift Contractor shall operate a suitable Hot Work Permit System and shall also, were applicable, comply with the requirements of the Purchaser's Permit System.

Where Oxy-propane equipment is to be used then the personnel involved shall have a minimum of two years' experience and training certificates shall be provided. A Fire Watchperson must also be present and shall continue to be present for a minimum period of one hour following completion of the process.

In terms of manual handling, all dismantled materials shall be broken down into adequately manageable sections, ready for disposal, and using mechanical methods wherever possible.

All equipment and redundant materials will be removed from the lift machine room and lift shaft areas via an agreed route approved by the Engineer.

The Lift Contractor shall apply safety measures in accordance with the requirements of BS 7255, BS 6187, HSE Guidance FOD 1-2013 and LEIA Guidance Demolition and Dismantling of Lifts PA54.

3.12 Lift D – Option for New Ground Floor Entrance

The lift contractor shall provide an additional optional cost for form a new entrance at the ground floor, reception side. The costs shall include all associated builders and making good works.

3.13 Fire Stopping

The Lift Contractor shall install suitable fire stopping, rated such as to provide a level of fire resistance equal to, or in excess of, the surrounding material.

Where required by the building's fire strategy or local authority requirements, the Lift Contractor shall utilise temporary firestopping where compartmentation is breached during the course of their works

The Lift Contractor shall install the fire stopping throughout the entire lift installation, including the lift machine room, pulley rooms, and lift shafts, such as may be required in order to meet LPC and Building Regulations Approved Document B requirements.

All fire stopping shall be certified to confirm compliance with the Building Regulations and each location shall be tagged with details of the installing contractor, fire rating, material used, and the date of installation.

✓SECTION 4

SCHEDULE OF ELECTRICAL WORK

4 SCHEDULE OF ELECTRICAL WORK

4.1 Mains Supply Cable

The Lift Contractor shall test to satisfy themselves that the existing electrical main supply cable is adequately rated, including earth loop impedance and the required number of conductors and earth conductors, and in a satisfactory condition to be re-used to supply the new lift installation and shall provide a certificate from a suitably qualified Electrician registered with one of the following bodies: NICEIC, ECA.

If the Lift Contractor should find that existing cable is not adequate, they shall allow for providing a new cable and show the cost for this in the appropriate part of the Fixed Price Summary.

Any new cable and its installation shall meet the requirements of current edition of BS7671 the IET Wiring Regulations.

4.2 Main Supply (Fire Fighting Lift)

Two electrical supplies shall be made available for the Fire Fighting lift both of which shall be designed, manufactured and installed in accordance with the requirements of BS EN71-72, BS9999 and BS8899:

The Primary supply shall be obtained from a sub-main exclusive to the lift and independent of any other main or sub-main.

The Secondary supply shall be of sufficient capacity to maintain in operation:

a) The Fire Fighting lift.

b) Normal lighting and shaft lighting within the Fire Fighting shaft.

c) The Fire Fighting communication system.

d) Any mechanical ventilation or pressurisation system which operates in conjunction with the operational use of the Fire Fighting shaft.

e) Any pumps installed in the lift pit.

f) Any pumps required to feed the fire main.

The electrical supply cables supplying the Fire Fighting lift shall be installed in accordance with BS7671 the IET Wiring Regulations and shall be routed in a protected route, which may include the Fire Fighting lift shaft.

The Primary and Secondary supplies shall be terminated in a changeover device which shall be located within the Fire Fighting shaft or motor room, and which shall automatically affect a transition from Primary to Secondary supply if any phase of the Primary supply should fail.

'ASCO' or equal to the approval of the Engineer shall provide this device.

The device shall have 2 outputs to show the supply in use. These shall be wired to a suitable termination box at the Fire Service Access level and will then be connected to the indication in the fire control unit described in Section 6.

4.3 Consumer Unit

The Lift Contractor shall provide a suitably sized electrical consumer unit to be located within each lift machine space and fed from a separate single-phase supply. Should the existing main supply not be adequate, the Lift Contractor shall include for a separate suitably rated single-phase supply to be run from the intake room to feed this board.

All of the existing circuits are to be diverted and fed from the consumer unit. These include, but may not be limited to:

a) Auto dialler/Communications Unit

b) Car lighting.

c) Machinery space lighting.

d) Machinery space socket outlets.

e) Shaft lighting.

f) Shaft socket outlets.

Each sub-circuit shall be identified with an engraved label and protected by an MCB and an RCD designed to operate at 30mA.

4.4 Machinery Lighting

The Lift Contractor shall install new low energy LED light fittings within the lift machinery area such as to provide a minimum level of illumination of 200 lux at any point within the machinery area. This lighting may form part of the lift shaft lighting and shall be controlled by a switch (or switches) located adjacent to the landing entrance access door(s) and/or machinery area access and shall be fitted at a convenient height.

The machinery area lighting shall provide the minimum levels of illumination in all areas of the machinery area such as meet the requirements of BS EN81-20 and the PUWER Regulations.

The light fittings closest to the lift controller and/or equipment located within the machinery area shall be utilised as an emergency light and shall derive its alternative power source from an auto-recharge unit fitted with nickel-cadmium cells. The unit shall have a minimum duration of 3 hours and a maximum recharge time of 12 hours and shall be in full compliance with the requirements of BS5266-1.

The light fittings shall be suitably guarded in accordance with the PUWER Regulations.

4.5 Lift Shaft Lighting (MRL Lifts)

The Lift Contractor shall provide permanent lift shaft lighting throughout the travel of the lift. All associated wiring shall be installed and routed in metal conduits which are separate from the lift electrical wiring. The light fittings shall be industrial type low energy LED bulkhead with polycarbonate diffusers to the approval of the Engineer

Three-way switching shall be provided such that the shaft lighting can be controlled from the lift machine room/machinery spaces, lift car top and from the lift shaft pit. The shaft light switch in the lift pit shall be readily accessible from the landing and shall be located within 0.75 m of the inner edge of the landing entrance door frame and at a height not less than 1.0 m above the landing sill level.

Light fittings shall be mounted 500 mm from the pit floor and 500 mm from top of the lift shaft, and at an adequate pitch in-between, such as to ensure that the level of illumination specified in BS EN81-20 are achieved at all point within the lift shaft.

The light fittings at the top of the shaft and in the pit area shall each incorporate an emergency light facility, with an alternative power source derived from an auto-recharge unit fitted with nickel-cadmium cells. These units shall have a minimum duration of 3 hours and a maximum recharge time of 12 hours and shall be in full compliance with the requirements of BS COP BS5266-1.

4.6 Socket Outlets

The Lift Contract shall provide, within the lift machine room, machinery area/s, pulley room and lift pit, switched 13-amp three pin double socket outlets, each with integral RCD which shall be designed to operate at 30mA. The electrical supplies to these socket outlets shall be derived from the consumer unit located within the lift machine room/machinery area.

4.7 Pit Socket Outlets (Fire Fighting Lift)

The lift pit electrical socket outlet within the lift shaft shall be located and at least 500 mm above the level of the highest permissible water level in the lift pit and shall and shall be protected to IPX3 rating.

The pit electrical socket outlet shall derive its supply from the consumer unit in the lift motor room/machinery space and shall be safeguarded such as to ensure its failure does not lead to the failure of any other component.

SECTION 5

SCHEDULE OF EQUIPMENT

5 SCHEDULE OF EQUIPMENT

5.1 Schedule of Equipment

Number & Type of Lift	4 No. Passenger Lifts
Capacity	13 Persons or 1000Kgs
Speed	2.5 m/s subject to design survey.
Levels Served	Lifts A & B – G, 1, 3-12 inc. Lift C – G (Front & Rear), 1-13 inc. Lift D* – G (Rear), 1-13 inc.
No. of Stops	Lifts A & B – 12 Lifts C & D - 14
Machine Position	Head of the shaft
Drive Systems	Gearless VVVF
Duty Cycle	240 sph
Levelling Accuracy	+/- 3mm
Power Supply	As existing subject to satisfactory test
Control Systems	DCS Group Control
Control Features	Lift C – Fire Evacuation Lift Lift D – Fire Fighting Lift
Signal & Operating Fixtures	DCS Touch Screens and individual lift identifiers at all floors.
Car Dimensions	1100mm wide x 2100mm deep x 2200mm high
Car & Landing Entrances	2 Panel side opening 900mm x 2000mm
Landing Frame	Standard small frame as existing
Door Tracks	Aluminium
Architraves	Standard small frame as existing
Shaft Dimensions	As existing
Pit Depth	

*Option for Lift D ground floor entrance to be created on the reception side.

5.2 Schedule of Equipment to be Retained (Traction)

All items in this Schedule **not** identified as being Retained or Refurbished are to be renewed.

		Retain	Replace	Refurbish
1.	Lift Machine		✓	
2.	Traction Sheave		✓	
3.	Brake		✓	
4.	Motor		✓	
5.	Hand Winding Wheel		✓	
6.	Governor		✓	
7.	Divertor Pulleys		✓	
8.	Controller		✓	
9.	Control System		✓	
10.	Selector		✓	
11.	Limit Switches		✓	
12.	Proximity Switches/Vanes/Tape		✓	
13.	Landing Door Support Sills		✓	
14.	Landing Sill RSA Supports		✓	
15.	Landing Door Frames		✓	
16.	Landing Door Panels		✓	
17.	Landing Door Bottom Tracks		✓	
18.	Landing Door Locks		✓	
19.	Landing Door Suspensions, Drives & Shoes		✓	
20.	Landing Door Closers		✓	
21.	Landing Fascias		✓	
22.	Landing Architraves		✓	
23.	Buffers		✓	
24.	Counterweight Screen		✓	
25.	Trailer Termination		✓	
26.	Car Sling		✓	
27.	Car Shoes		✓	
28.	Car Door Panels		✓	
29.	Car Door Tracks		✓	
30.	Car Door Operator		✓	
31.	Car Door Safety Edge		✓	
32.	Car Top Control		✓	
33.	Car Enclosure		✓	
34.	Car Interior Lighting		✓	
35.	Safety Gear		✓	
36.	Car Toe-guard		✓	

		Retain	Replace	Refurbish
37.	Counterweight	✓		
38.	Counterweight Shoes		✓	
39.	Compensation		✓	
40.	Car Station		✓	
41.	Car Indicator		✓	
42.	Landing Push Faceplates		✓	
43.	Landing Push Back Boxes		✓	
44.	Landing Indicator Faceplates		✓	
45.	Landing Indicator Back Boxes		✓	
46.	Fireman's control Switch		✓	
47.	Pit Stop Switch		✓	
48.	Pit Access Ladder		✓	
49.	Car Guides		✓	
50.	Counterweight Guides	✓		
51.	Guide Fixings	✓		
52.	Ropes – Main		✓	
53.	Ropes – Governor		✓	
54.	Car Emergency Lighting		✓	
55.	Emergency Alarm		✓	
56.	Emergency Hand-Winding		✓	
57.	Trunking/Conduit Shaft		✓	
58.	Wiring		✓	
59.	Trailing Flexes		✓	
60.	Shaft and Pit Lighting		✓	
61.	Top of Car Safety Rail		✓	
62.	Statutory Notices		✓	
63.	Lifting Beams	✓	Load test and mark with SWL	
64.	Machine Isolation Switch		✓	

Where there may be variance in the requirements of the Specification to British Standards, the Lift Contractor **must** advise the Engineer in writing at the time of Tender, including any extra costs associated with compliance. Under no circumstances will any claim be accepted based on lack of knowledge of the existing site conditions.

5.3 Car Interior

The Lift Contractor shall state the maximum weight of finishes allowed for in Section 9.

Car Capacity Details	The details of capacity expressed in metric terms in compliance with BS EN81-20 and BS 5655 requirements shall be engraved in the car station panel and filled with an epoxy resin, colour to approval.
Operating Panel	Brushed stainless steel. Layout and design in accordance with EN81-70 for lifts using DCS. Concealed floor pushes for use during evacuation control or firefighting on lifts C & D.
Front Wall	Patterned stainless steel to approval.
Side Walls	Lower - Patterned stainless steel to approval Upper (COP Wall) – Back painted glass, colour to approval. Upper (Opposite COP) – Single piece safety mirror
Rear Walls	N/A
Hand Rail	Tubular stainless steel in accordance with EN81-70.
Ventilation	Ventilation apertures shall be provided at the upper and lower levels. These shall be designed such as to prevent the passing of a rigid rod of 10 mm in diameter from the car interior and shall be protected on the exterior of the car by the provision of deflectors to prevent foreign objects being passed through. The effective area of ventilation apertures shall be not less than 1% of the available car area at each of the upper and lower apertures. Clearance around the lift car doors may be utilized to provide up to 50% of the required effective area. 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 a key switch in the car station suitably engraved to depict its use. With the key switch in the off position, 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	White powder coated. Firefighting lift to incorporate access facility in accordance with EN81-72.
Lighting	LED downlights. The design of the lighting shall be such as to provide a minimum lighting intensity of 100 lux on the control devices and at any point 1 m above the floor and not less than 100 mm from any wall.
Emergency Lighting	The light fitting nearest the car operating panel shall act as an emergency light in the event of failure of the normal lighting supply and shall include an alternative supply from

	an auto recharge unit fitted with maintenance free nickel cadmium batteries. The light shall provide a minimum lighting intensity of 5 lux for 1-hour measured at a point 1 m above the floor in the centre of the lift car. The minimum duration for the light shall be 3 hours with a maximum re-charge time of 12 hours.
Skirting	Patterned stainless steel to selection.
Floor covering	Karndean or equal to approve. The flooring material shall be of matt finish incorporating a non-slip surface and fire characteristics in accordance with BS EN81-20

Final car details must be submitted for approval

5.4 Lift Car (Fire Fighting Additions)

The lift car and lift car equipment design shall be designed, constructed and installed in compliance with the requirements of BS EN 81-20, BS EN 81-50, BS EN 81-70, BS EN 81-72, BS 9999, BS EN 81-73 and BS 8899.

Dual Entry Lift Cars

Where a firefighters lift has a dual entry lift car and all the firefighters lift safe areas are located on the same side as that of the fire service access level, and in the case of one car operating panel:

- the car operating panel shall have 2 door open buttons, which are easily identifiable as to which door they are associated.
- the door open button for the fire service access level side shall be illuminated in Phase 2 and the other door open button shall be made inoperative in Phase 2 and doors not located at the same side of the fire service access level shall not be able to open.

In the case of more than one car operating panel:

- the car operating panel adjacent to the fire service access level side shall be for firefighters use under Phase 2 operation and shall be marked with the firefighters lift pictogram set out at Annex G of BS EN 81-72.
- the other car operating panel shall be made inoperative under Phase 2 operation.
- where the firefighters lift car operating panel includes more than one door open button, the door open button corresponding to the fire service access level side shall be illuminated under Phase 2 operation and the other door open button shall be made inoperative under phase 2 operation.
- doors which are not on the same side as the fire service access level shall not open.

Where a firefighter's lift has a dual entry lift car and all firefighters lift safe areas are not located on the same side as that of the fire service access level, only one car door shall be open at a time and only on the side of the firefighters lift safe area at that level; and the following additional requirements shall apply:

In the case of a single lift car operating panel:

- the lift car operating panel shall incorporate two door open buttons, which are easily identifiable as to with which door these are associated.
- under Phase 2 operation, when the lift is standing at a level or the lift is in motion with a car call registered, the available sides of the safe area at the destination landing shall be indicated by illuminating the corresponding door open buttons and other door open buttons shall be made inoperative.

In the case of more than one lift car operating panel:

- only one of the lift car operating panels shall be for firefighters use under Phase 2 operation and shall be marked with the firefighters lift pictogram set out at Annex G of BS EN 81-72, and the car operating panel for firefighters' use shall serve all intended floors and incorporate two door open buttons.
- when the lift car is standing at the floor level, the available safe area sides on that level shall be indicated by illuminating the corresponding door open button under Phase 2 operation, and other door open buttons shall be made inoperative.

- when the lift is in motion and a car call registered, the available sides of the safe area at the destination landing shall be indicated by illuminating the corresponding door open buttons under Phase 2 operation.
- other lift car operating panels shall be made inoperative under Phase 2 operation.

Operational Design Provisions

The Firefighters lift, together with its shaft, enclosure and all associated equipment shall be designed such as to operate correctly for the time period equal to that required for the structure, and to travel between the fire fighters access level and the highest landing served under firefighting control in not more than 60 seconds.

Electrical devices at lift landings, other than the fire service access level, shall be designed to operate correctly in an ambient temperature range of 0° to 65°, or shall be rendered non-operational whilst the lift is under firefighting control. Any malfunction of landing devices shall not prevent operation of the lift whilst under firefighting control. All other electrical lift components shall be designed and constructed to operate correctly in an ambient temperature range of 0° to 40°.

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

In cases in which the vertical distance, measured between landing sills, exceeds 7 m intermediate emergency doors, designed and constructed in accordance with the requirements of BS EN 81-20 and BS EN 81-50, shall be provided such that the distance between any two adjacent landing sills does not exceed 7 m.

Non-firefighting lifts, which are part of the same interconnected lift group or system as the firefighting lift, shall operate in accordance with the requirements of BS EN 81-73.

Lift machine rooms and machinery spaces, both inside and outside of the well, shall be fire protected to the same level as that of the building structure.

In cases in which hydraulic lifts are applied as firefighting lifts the hydraulic piping and electrical wiring between the machinery spaces and the lift well shall be fire protected to the same level as that of the building structure.

Car Roof and Trap Door

The car roof shall be designed to prevent accumulating water and facilitate controlled draining from

the roof. Electrical equipment within the car roof and outer walls shall be classified to at least IPX3.

A roof trap shall be provided complying with BS EN 81-72. The trap shall be of minimum clear opening dimensions 0.5 m x 0.7 m (0.4 m x 0.5 m in the case of lift cars of 630 kg rated load), measured with the ladder in the rescue position in accordance with BS EN 81-72.

Access to the trap from the lift car interior shall be unobstructed and free of the presence of any permanent fitting or lighting. Any suspended ceiling shall be easily openable or removable without recourse to special tools. The ceiling shall be openable when persons are present in the lift car and shall be secured such that the fall of the ceiling shall not create a hazard. The handling force of any part of the ceiling and trap shall be less than 250 N. The trap release point, in the lift car and on the roof of the lift car, shall be clearly identified including when the trap is in the open position.

The trap shall be electrically interlocked and shall be openable from the inside of the lift car using a key as described in BS EN 81-20. Whenever the trap door is opened further operation of the lift shall be prevented. Closing of the trap door, including closing of the electrical interlock, shall not, in itself, permit reinstate the lift, which shall require an additional positive action.

Electrical Equipment

All electrical equipment, installed 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 EN 60529.

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 lift landing signals, and operating devices shall de designed, constructed and installed such that these shall not register false signals due to the effects of heat, smoke, water or moisture.

The landing signal and operating devices shall be arranged so that their failure and/or malfunction shall not affect the operation of the lift in its firefighting mode.

All of the lift landing signals, indicators and operating devices shall be designed, constructed and installed such as to provide a minimum level of protection in accordance with IPX3 of BS EN 60529.

Lift buffer condition electrical monitoring switches and stop switches in the lift well pit shall have a minimum rating of IP67.

Firefighter Rescue

The recue procedure adopted by the Lift Contractor shall be in compliance with the requirements of BS EN 81-72 and shall be possible for all positions in the lift where the lift car could be blocked throughout the full travel of the lift.

Ladders

Ladders shall be designed and constructed in accordance with EN 131-1 and stored in such location to avoid the creation of tripping hazards during normal maintenance operations and such that these may be safely deployed.

An electrical safety device which is designed and constructed in accordance with the requirements of BS EN 81-20 shall be provided in order to prevent the lift from operating if the ladder is not in its stored position.

Where a moveable ladder is provided for rescue procedures between the car and the car roof, the length of the ladder shall be at least 1 m longer than the height of the lift car and shall be installed to the shorter side of the emergency trap door opening.

The length of any such moveable ladder which is provided for rescue procedures between the car roof and the landing shall be such as to enable a firefighter to release the lift landing door lock mechanism of the next floor from the car, in order to enable a firefighter to egress the roof of the lift car. The maximum length of any moveable ladder shall not exceed 6 m.

When deployed that ladder shall not rest against any landing doors and shall be supported from suitable points on the lift car roof. It shall be possible to open the landing door(s) by the use of one hand only.

Rescue from outside the car

A ladder shall be provided to enable safe descent into the lift car from the car roof. The ladder shall comply with the general provisions set out here above and shall be deployed from the car roof. This ladder may be the same ladder used for rescue from inside the car.

Self-rescue from inside the car

Access shall be provided to enable the full opening of the emergency trap door from inside the car.

A ladder or stepping points shall be provided in order to allow safe ascent onto the lift car roof and the ladder shall be positioned on the shorter side of the emergency trap door opening.

In cases in which a ladder is provided for ascent onto the lift car roof this ladder comply with the general provisions set out here above and shall be deployed from inside the lift car.

In cases in which stepping points are provided the maximum step rise shall be 0.4 m and each stepping point shall be capable of supporting a load of 1500 N. The free distance between stepping points and the vertical wall shall not be less than 0.15 m.

A ladder which is in compliance with the general provisions set out here above shall be provided in order to enable safe ascent from the lift car roof to the next landing above.

A simple diagram or symbol shall be provided inside the well at each landing entrance, close to the lock, clearly showing how to unlock the landing door.

SECTION 6

TECHNICAL SPECIFICATION

6 INFORMATION FOR APPROVAL, NOTICES AND TECHNICAL SPECIFICATION

6.1 Information for Approval and Notices

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

Before commencing work, copies of the following working drawings shall be submitted for approval of the Engineer.

Item Description

a) General arrangement and builders work detail, shaft and machine room.

b) Car enclosure, car doors, landing entrance complete with frame fixing details (where applicable).

c) Landing architrave and threshold details including the 25 mm ramp for Firefighters' lift(s).

d) Landing door frame firestopping details.

e) Car design, Perspective and Manufacturing Drawings.

f) Sketch drawing of proposals for landing protective hoardings.

g) Car operating panel engraving details.

h) Landing call stations and lift identifier details.

After approval copies of each shall be submitted for use during the duration of the Contract. Electronic copies shall also be provided in Auto Cad 2000 format or equal as advised.

In conjunction with drawing submittals detailed above the Lift Contractor shall submit for approval the following details as appropriate to the scope of this specification.

1. Evaluation of traction to BS ISO8100-2.

2. Evaluation of factor of safety for suspensions means to BS ISO8100-2.

3. Evaluation of suspension means lifetime.

4. Machine sheave shaft.

5. Machine motor power.

In cases where the installation is to be a 'model lift' as defined by The Lifts Regulations 2016 as amended, the Lift Contractor shall provide full details of the type of examination and limitations of application.

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 encapsulated 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.

6.2 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 shall be relief engraved 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.

6.2.1 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.

6.2.2 Car Top and Pit Access and Egress

The Lift Contractor shall provide onsite full site-specific details of the process and method of access and egress for the car top and pit.

Details shall be fixed inside the control panel or Emergency and Test Panel.

In addition, details of the site-specific pit egress and pit inspection reset procedure shall be securely fixed adjacent to the pit inspection station.

6.2.3 Notices - Electrical

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 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.

6.2.4 Machine Area

Lift Machine

The gearless machine shall comprise a traction sheave directly coupled to an electric motor and incorporating an electro-mechanical brake. 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 their 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 EN 81-20.

The hoisting motor shall be either a permanent magnet synchronous motor or an induction motor which is designed specifically for use with inverters and rated for the duty set out in this Specification. The synchronous speed of the motor shall not exceed 1500 rpm. The design and construction of the motor shall be in accordance with the requirements of the BS EN 60034 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 in the event of a fault condition arising.

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

All moving parts of the lift machine shall be suitably guarded in accordance with the requirements of this Specification and those of BS EN ISO 14120 and BS EN 81-20. 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 under any load condition between 0% and 110% shall not exceed 150 N.

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, constructed, and tested in accordance with the requirements of BS EN 81-20 and BS EN 81-50

The machine brake, unassisted by any other equipment of the lift, shall be such that it 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.

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.

6.2.5 Motor (VVVF)

The hoisting motor shall be either a permanent magnet synchronous motor or an induction motor which is designed specifically for use with inverters and rated for the duty set out in this Specification. The synchronous speed of the motor shall not exceed 1500 rpm. The design and construction of the motor shall be in accordance with the requirements of the BS EN 60034 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 nameplate 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.

6.2.6 Traction and Diverter 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 shall not be less than 40:1.

The roping system shall be 2:1

6.2.7 Roping Arrangement (Machine Roomless)

Each lift shall be designed such that the lift car is configured in an underslung arrangement and applying a 2:1 suspension roping arrangement. Lifts cars configured in an overslung 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.

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.

6.2.8 Machinery Guarding – General Requirements

The design and construction of machinery guards shall meet with all of the requirements of The Supply of Machinery (Safety) Regulations as amended, and with the requirements of PUWER, BS EN81-20 and BS EN81-50, the Lifts Regulations 2016 as amended, 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.

6.2.9 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 The Supply of Machinery (Safety) Regulations 2008 as amended, and with the requirements of PUWER, BS EN81-20 and BS EN81-50, the Lifts Regulations 2016 as amended, 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.

6.2.10 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 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 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 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.

6.2.11 Stop Switches

The Lift Contractor shall supply and install a stopping device which is in accordance with the requirements of BS EN81-20.

The design and construction of the stopping device shall be in accordance with the requirements of BS EN60947-1-1.

The Lift Contractor shall supply and install, on or near to the stopping device, a suitable sign marked ‘STOP’.

The stopping device shall be installed adjacent to the lift machine in a position and at a height where this is readily accessible to personnel in an emergency situation.

6.2.12 Emergency Electrical Operation

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 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 BS EN81-20.

The emergency electrical operation shall be supplied from the main electrical supply and, where building requirements are such, from any stand-by or secondary electrical supply.

The means of emergency operation shall incorporate an emergency electrical operation switch, designed and constructed in accordance with the requirements of BS EN81-20, which when operated shall enable the control of lift car movement through constant pressure buttons which are design such that these are protected against accidental operation. The emergency electrical operation control shall be designed and constructed to incorporate a minimum level of protection of IPXXD in accordance with BS EN60529.

The lift car speed shall not exceed 0.3 m/sec. The lift machine shall be observed directly from the point at which the emergency operation controls are positioned or shall be observable by way of a display device which is designed and constructed in accordance with the requirements of BS EN81-20.

The operation of the emergency electrical operation switch shall be such as to prevent all movement of the lift car except for that controlled by the switch.

The functionality of the emergency operation system shall be dependent upon all inspection control devices being set to 'Normal' operation. Activation of the emergency electrical control switch whilst any inspection control device is set to 'Inspection' control shall NOT override the inspection control which will remain fully operative until such time as this is reset to 'Normal' control.

The functionality of the emergency operation shall be immediately overridden by the switching of any inspection control device to 'Inspection' control, and the inspection control device shall remain fully operative.

Whilst switched to emergency electrical operation the following devices shall be rendered inoperative:

- Slack rope or slack chain device.
- Lift car mounted safety gear operated switch.
- Governor overspeed detection switch.
- Ascending car protection switch.
- Buffer return switch.
- Final limit switch.

6.2.13 Automatic Rescue Device ARD (Electrical Emergency Operation)

The Lift Contractor shall provide for the installation of a suitable battery-operated automatic rescue system, which is designed and constructed in accordance with the requirements of BS EN81-20.

In the event of mains power failure, and after a short delay, the system shall recover the lift at slow speed to the nearest suitable floor and open the doors. The lift will remain out of service until mains power is restored, at which point the lift will recover and return to normal service.

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 affected.

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.

In all cases the means of operation and/or rescue shall function such as to provide for movement of the lift car through the full operational load range of the lift car from 0% to 110% lift car load.

6.2.14 Floor Level Indication During Hand-Winding

In order to assist emergency hand-winding/lowering operations, the Lift Contractor shall supply and install a unit which incorporates an activation switch, a digital lift car position indicator and an audible electronic sounder. The unit shall be installed adjacent to the lift machinery hand lowering device. When the activation switch is placed in the 'ON' position and the lift car is position which is within the unlocking zone of any landing, the digital indicator will read the floor of the particular landing, and the audible sounder shall activate. The unit shall have a separate electrical supply which is configured to supply a self-contained low voltage, auto re-charge battery pack with rechargeable nickel cadmium batteries.

The hand-winding activation switch is to be of the changeover type, with the normally open contacts configured to operate the audible sounder and the normally closed contacts configured to open the lift safety circuit preventing operation of the lift whilst the activation switch is in the 'ON' position.

6.2.15 Over-speed Governor (Machine Roomless)

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.

The overspeed governor shall be subject to Type Examination in accordance with the requirements of BS EN81-50, the Lifts Regulations 2016 as amended, and a Type Examination Certificate which is in accordance with the requirements 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 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 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.

6.2.16 Control Panels (Machine Roomless)

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 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 labelling, and a nomenclature compatible with the circuit diagrams shall be provided.

The hoist/pump 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 by 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.

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 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 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 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.

Where required, and/or where required by this Specification, an Emergency Electrical Control Operation device shall be provided, and shall be designed and constructed in accordance with the requirements 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 room 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.

6.2.17 PESSRAL Devices

The use of PESSRAL devices for the operation of safety components as defined in BS EN81-20 shall be subject to prior approval of the Engineer.

The Lift Contractor shall be responsible for informing the Engineer of any PESSRAL devices to be contained within the works.

All PESSRAL devices shall satisfy the requirements of BS EN81-20 and BS EN81-50.

Where a PESSRAL device is provided, security controls and countermeasures, which satisfy the requirements of BS ISO 8102-20 for safety functions, shall apply.

The Lift Contractor shall provide full details of the proposed PESSRAL device with their tender including detailed description of the device operation together with type test certification including all referenced appendices.

6.2.18 Drive System (VVVF Regenerative)

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, stepless acceleration/deceleration and stopping cycles and to achieve a floor level stopping accuracy of $\pm$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 lift drive control system shall incorporate a regenerative function such that energy which is generated when the lift drive motor is in braking mode is transferred back into the building electrical supply as clean energy, without the introduction of undue distortion or harmonics.

The lift drive control system shall incorporate means to ensure regenerated energy remains in full synchronization with the supply at all times.

Prior to commencement of material procurement, the lift contractor shall be responsible for ascertaining the suitability of the building electricity supply network to supply lifts which have regenerative type variable voltage variable frequency motor drive systems.

In cases where the lift can be supplied by a back-up generator the lift drive system shall be arranged such that when supplied by a back-up generator it is automatically reconfigured so that the regenerative

unit becomes temporarily disabled and the system shall operate in a dynamic resistive braking mode. The lift contractor shall provide all details of interfacing requirements for this feature at the time of tender.

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 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 EN61800-5-1, BS EN61800-5-2, 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.

6.2.19 Rope Stretch Re-levelling

The lift control and drive system shall incorporate a means to re-level the lift car after this has stopped and in order to allow correction of the stopping position in relation to rope stretch variations during loading or unloading.

Movement of the lift car with the doors open shall be restricted to a speed not exceeding 0.3 m/sec, shall be limited to within the unlocking zone, and shall be controlled by a device which is designed and constructed in accordance with the requirements of BS EN81-20.

The lift car, during loading and unloading, shall be retained with 10 mm of level, outside of which the re-levelling shall be initiated. Upon the operation of re-levelling the lift car shall be automatically corrected to within 5 mm of level.

6.2.20 Destination Control System - New Lift

A group control system shall be provided drawn from the lift manufacturer's top range of equipment and shall incorporate the following features:

The group control system shall incorporate a destination call control algorithm which is designed to optimise service capability under all conditions of service including Up-Peak, Down-Peak and Light-Traffic situations. The system shall incorporate an element of artificial intelligence such as to enhance and refine the system response to historical traffic patterns and shall minimise round trip times by reducing the number of stops. An automatic master/slave back up system shall be deployed in order to ensure continuous lift service and prevent total system failure should a single element fail.

The group control shall allow passengers to register their chosen floor, and to be directed to their assigned lift car, and travel with the minimum number of stops to their destination floor.

Touch screens and/or key pads shall be provided at all landing lobbies in order to enable passengers to register their chosen floor destination. An associated indicator screen shall direct passengers to the assigned lift car. In order to reassure passengers that they are entering the correct lift car, the allocated destination floors shall be duplicated in the appropriate lift car display. Without any requirement to register any further calls the lift car shall travel, with the minimum number of stops, to the selected destination call(s).

A separate means shall be provided in order to ensure that disabled persons are directed to specific lift cars which are fully compliant with the requirements of the Equality Act 2010. These lift cars shall incorporate audible and visual means of floor destination signalling.

The system shall incorporate an optional facility to register destination calls by means of a security ID card or alternative proximity detected device.

The door dwell time shall form part of the system control algorithm with the doors remaining open for the minimum time period necessary in order to ensure that all passengers have boarded and shall incorporate door failure protection and door nudging features.

The system shall incorporate a facility for future installation of 'fault logging' and remote monitoring equipment complying with BS EN627.

The system shall be designed and installed to guarantee uninterrupted lift service to all floors served should any single element fail and shall incorporate automatic self-testing of all microprocessor systems with automatic 'failover' to back-up systems. Single element failure shall include failure of the power supply and as such any servers shall be supplied by an uninterruptable power supply.

A means of incorporating changes to system parameters and analysing management diagnostics and system response times shall be provided.

6.2.21 Controller Overlay System – Modernisation

The control system shall be arranged to incorporate an efficient means of allocating landing calls between lifts whilst the lift controllers are being replaced and modernized. This system shall be designed to prevent lifts 'chasing' calls, double call allocation and/or similar inefficiencies.

This shall be achieved by means of an overlay system or similar which shall take over the functionality of the existing lift system dispatcher in order to ensure that all operational lifts operate and perform as a single group, utilising the new call allocation algorithm.

The proposed solution shall be installed at the beginning of the project such as to ensure a seamless transition between the old and new lift control systems.

6.2.22 Diagnostics

The lift control system shall incorporate facilities for fault and event diagnostics in the form of a microprocessor 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 it is possible 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 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.

6.2.23 Disabled Evacuation (Assisted Evacuation) – LIFT C

The following feature specification considers only the evacuation using the lift for persons with impaired mobility (or persons requiring assistance) assisted by a specially trained person (evacuation assistant). The system shall comply fully with the requirements of BS 9999 and DD CEN/TS 81-76.

Evacuation Lift Switch

The Lift Contractor shall provide a switch at the Main Evacuation Exit Floor (MEEF) clearly marked "Evacuation Lift."

The Evacuation Lift switch, associated control system and equipment shall be designed, constructed, and installed in compliance with the requirements of BS 9999 and DD CEN/TS 81-76.

The only functions which shall override this shall be Firefighters Control (if installed) and maintenance control or any safety device.

Communication System

The Lift Contractor shall provide a two-way communication system for interactive two-way speech communication, whilst the lift is in evacuation mode.

This shall allow communication between each floor served by the evacuation lift, the evacuation exit floor, the evacuation lift car, and any machine room or emergency and rescue panel.

The communication equipment within the lift car and at the MEEF shall be a built-in microphone and speaker, and not a telephone handset.

Special Features – Emergency Powering of Lifts with Evacuation Control

The Lift Contractor shall include the equipment to operate the lift, lighting, and communication system on both a primary and secondary power supply. The automatic changeover of which shall be by others.

When power supply failure occurs and is re-established the lift shall become available for service within 1 min. If the lift needs to move to establish its position, it shall not move more than one floor and towards MEEF and indicate its position.

Special Features – Protection of electrical equipment against water.

Where a lift provided with Evacuation Control is not a Firefighters Lift the electrical equipment shall be protected against water in compliance with BS EN81-72.

Faceplates, Indication and Notices - Evacuation System

All faceplates and notices shall be of the minimum size feasible and shall be of a design sympathetic with the other lift fixtures.

Within the car operating panel and above or adjacent to each landing door an illuminating sign shall be installed in compliance with the requirements of CEN/TS 81-76.

Within the car the sign shall be located between 1.6 m and 1.8 m from the car floor and on the landings the sign shall be located between 1.8 m and 2.5 m from the floor,

The signs shall be at least 60 mm x 30 mm and shall have a green background and use black and white pictograms as described in CEN/TS 81-76.

Main Evacuation Exit Floor

The designed MEEF shall be the ground floor.

6.2.24 Fire Fighting Control – D LIFT

The lift shall be provided with a firefighting control switch at the Fire Service Access Level.

The firefighting control switch and associated control system and equipment shall be designed, constructed and installed in compliance with the requirements of BS EN81-20, BS EN81-50, BS EN81-70, BS EN81-72, BS9999 and BS 8899.

On operation of this switch the operation of the firefighting control switch shall render all landing calls and the lift door protection system inoperative. The lift door system mechanical pressure sensing equipment shall remain operational at all times.

The lift car, if travelling towards the fire service access level, shall immediately continue to the fire service access level without stopping or answering any calls. If travelling away from the fire service access level, the lift shall stop at the next available floor where the doors shall remain closed and then return to the fire service access level. On arrival at the fire service access level, the lift car shall park with the doors open.

On arrival at the fire service access level the lift car interior push buttons shall be made activate and it shall be possible to register only one call at a time and to operate the lift by way of sustained pressure

on a car call button until the lift doors have fully closed. In the case that the call button is released before the doors are fully closed the doors shall immediately re-open.

Registration of a car call shall cause the lift to travel to the selected floor immediately and stop at that floor with the doors closed.

Whilst the lift car is in motion it shall be possible to register further calls from within the car. The lift shall stop at the nearest selected floor level in its current direction of travel. When the lift car stops all calls shall be cancelled automatically and the lift shall not depart the floor until a new call is registered.

When the car is stationary at the landing with its doors closed the application of a continuous pressure on the door open push button shall cause the doors to open. Should the door open button be released prior to the doors reaching the fully open condition the doors shall automatically re-close. Once fully open in the fully open condition the doors shall remain open until a new car call is registered.

6.2.25 Fire Alarm Automatic Recall (BS EN 81-73)

Behaviour of Lifts in the Event of Fire.

The lifts shall operate in accordance with the requirements of BS EN 81-73.

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 EN 81-73, 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.

6.3 Lift Car Frame and Enclosure

6.3.1 Car Frame

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.

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

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 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.

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.

The design of the lift car frame, platform 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 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.

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.

6.3.2 Car Enclosure (Steel Panels)

The car enclosure shall be constructed in zinc-coated mild sheet steel and each panel shall be flanged and bolted to give an enclosure of rigid and robust construction which is design and constructed in accordance with the requirements of BS EN81-20. The exterior of the panels is to 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 as to ensure that each wall of the lift car shall resist, without permanent deformation in excess of 1 mm and elastic deformation in excess

of 15 mm, a force of 300 N evenly distributed over an area of 5 cm^2 in round or square section and applied at right angles at any point from within the lift car.

The design and construction of the car enclosure shall be 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.

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 the requirements of BS EN81-20. 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.

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 external 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.

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
- Car walls – C-s2, d1
- Ceiling – C-s2, d0

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.

The flooring material shall be of matt finish incorporating a non-slip surface and fire characteristics in accordance with BS EN81-20

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.

6.3.3 Car enclosure (Fire Fighting Lift)

The lift car and lift car equipment design shall be designed, constructed and installed in compliance with the requirements of BS EN81-20, BS EN81-50, BS EN81-70, BS EN81-72, BS 9999, BS EN81-73 and BS8899.

Car Décor

The car enclosure shall be designed and constructed in accordance with the requirements of BS EN81-72 and BS EN81-20.

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
- Car walls – C-s2, d1
- Ceiling – C-s2, d0

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.

The flooring material shall be of matt finish incorporating a non-slip surface and fire characteristics in accordance with BS EN81-20.

Roof Trap

A roof trap shall be provided complying with BS EN81-72. The trap shall be of minimum clear opening dimensions 0.5 m x 0.7 m (0.4 m x 0.5 m in the case of lift cars of 630 kg rated load), measured with the ladder in the rescue position in accordance with BS EN81-72.

Access to the trap from the lift car interior shall be unobstructed and free of the presence of any permanent fitting or lighting. Any suspended ceiling shall be easily openable or removable without recourse to special tools. The ceiling shall be openable when persons are present in the lift car and shall be secured such that the fall of the ceiling shall not create a hazard. The handling force of any part of the ceiling and trap shall be less than 250 N. The trap release point, in the lift car and on the roof of the lift car, shall be clearly identified including when the trap is in the open position.

The trap shall be electrically interlocked and shall be openable from the inside of the lift car using a key as described in BS EN 81-20. Whenever the trap door is opened further operation of the lift shall be prevented. Closing of the trap door, including closing of the electrical interlock, shall not, in itself, permit reinstate the lift, which shall require an additional positive action.

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 firefighting control the lift shall operate correctly regardless as to smoke ingress to the lift wells or machinery spaces.

Firefighter Rescue

The recue procedure adopted by the Lift Contractor shall be in compliance with the requirements of BS EN81-72 and shall be possible for all positions in the lift where the lift car could be blocked throughout the full travel of the lift.

Ladders

Ladders shall be designed and constructed in accordance with EN 131-1 and stored in such location to avoid the creation of tripping hazards during normal maintenance operations and such that these may be safely deployed.

An electrical safety device which is designed and constructed in accordance with the requirements of BS EN 81-20 shall be provided in order to prevent the lift from operating if the ladder is not in its stored correct position.

In case in which a moveable ladder is provided for rescue procedures between the car and the car roof, the length of the ladder shall be at least 1 m in excess of the height of the lift car and shall be installed to the shorter side of the emergency trap door opening.

The length of any such moveable ladder which is provided for rescue procedures between the car roof and the landing shall be such as to enable a firefighter to release the lift landing door lock mechanism of the next floor from the car, in order to enable a firefighter to egress the roof of the lift car. The maximum length of any moveable ladder shall not exceed 6 m.

When deployed that ladder shall not rest against any landing doors and shall be supported from suitable points on the lift car roof. It shall be possible to open the landing door(s) by the use of one hand only.

Rescue from outside the car

Means of rescue may include portable ladders; or safety rope systems when suitable safe fixing points for the rescue are provided at each of the lift landings. The final design shall meet with the approval of the responsible Local Authorities and the Lift Contractor shall, where applicable and/or required, seek and obtain such approvals.

The design of the means shall be such as to allow the lift car roof to be safely reached whatever the distance of the car roof is from the nearest accessible landing sill.

A ladder shall be provided to enable safe descent into the lift car from the car roof. The ladder shall comply with the general provisions set out here above and shall be deployed from the car roof. This ladder may be the same ladder used for rescue from inside the car.

Self-rescue from inside the car

Access shall be provided to enable the full opening of the emergency trap door from inside the car.

A ladder or stepping points shall be provided in order to allow safe ascent onto the lift car roof and the ladder shall be positioned on the shorter side of the emergency trap door opening.

In cases in which a ladder is provided for ascent onto the lift car roof this ladder comply with the general provisions set out here above and shall be deployed from inside the lift car.

In cases in which stepping points are provided the maximum step rise shall be 0.4 Mm and each stepping point shall be capable of supporting a load of 1500 N. The free distance between stepping points and the vertical wall shall not be less than 0.15 m.

A ladder which is in compliance with the general provisions set out here above shall be provided in order to enable safe ascent from the lift car roof to the next landing above.

A simple diagram or symbol shall be provided inside the well at each landing entrance, close to the lock, clearly showing how to unlock the landing door.

6.3.4 Car Enclosure (Protective Drapes) – One Set

The lift car shall be provided with a complete set of padded protective drapes, which are custom manufactured to suit the car interior. These shall include a cut out for the lift car operating panel/s and if required warning notices of the presence of glass or mirrors behind the drapes.

The design shall avoid the use of permanently fixed hanging studs, and any fixings shall be in a material to match the metal work finishes of the lift car interior. Concealed fixings to hook onto false ceilings/expanding poles fixed into the drapes with protective ends to avoid damage to the wall may form the basis of acceptable proposals. The design and all finishes shall be to the approval of the Engineer.

The drapes shall be provided in a suitably labelled storage bag or, should space permit by way of a hanging rack to be located to meet the Purchaser's instruction.

6.3.5 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 Approved Body, may be applied. Such designs shall incorporate electrical interlock safety switches, which are designed and constructed in accordance with 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.

6.3.6 Lift Car Apron

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

The apron shall extend for at least the full width of the clear landing entrance and shall extend vertically downwards by at least 750 mm. The lowest edge of the apron shall be formed to provide a chamfer of angle of at least 60° and which shall extend in the horizontal plane for not less than 20 mm.

Only countersunk screws will be accepted such that the surface, at all points on each panel, is smooth and flush. Any projections on the face of the apron shall not exceed 5 mm and any projections in excess of 2 mm shall be chamfered at least 75° to the horizontal.

The design, construction and installation of the apron shall be in accordance with the requirements of BS EN81-20 and such that this is capable of withstanding a force of 300 N, which is applied at right-angles to the fascia from the landing side, and at any point on the lower edge, and evenly distributed over an area of 5 cm^2 in round or square section. The apron shall resist without permanent deformation in excess of 1 mm and without elastic deformation in excess of 35 mm.

6.3.7 Safety Gear (Traction)

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.

The safety gear shall be subject to Type Examination in accordance with the requirements of BS EN81-50, the Lifts Regulations 2016 as amended, and a Type Examination Certificate which is in accordance with the requirements 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.

6.3.8 Protection Against Unintended Movement of the Lift Car

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 in 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 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 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 BS EN81-50, and the Lifts Regulations 2016 as amended.

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 BS EN81-50, and the Lifts Regulations 2016 as amended.

The Lift Contractor shall state the type of device and the means detection, means of actuation and stopping means in Section 9 of this document.

6.3.9 Ascending Car Over-Speed 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 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 in 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 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 BS EN81-50, and the Lifts Regulations 2016 as amended.

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 BS EN81-50, and the Lifts Regulations 2016 as amended.

The Lift Contractor shall state the type of device and the means detection, means of actuation and stopping means in Section 9 of this document.

6.3.10 Suspension Rope (Machine Roomless)

The requirements regarding suspension are as follows:

a) In the case of traction lifts at least four suspension ropes shall be used, and in the case of hydraulic lifts at least four suspension ropes for each hydraulic jack. 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 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 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 (6 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 UK Approved Body, and in accordance with the Lifts Regulations 2016 as amended 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.

6.3.11 Compensation (New)

In cases where rope compensation is required the Lift Contractor shall supply and install compensating pulleys/weights together with pit mountings, fixings and guide rails suitably designed to meet the hoisting, traction and power design requirements of the lift. In all cases the ratio of the pitch diameter of the tension pulleys and the nominal diameter of the compensating ropes shall be no less that 30:1.

Slack compensating rope switches shall be provided with the switches designed and installed in accordance with the requirements of BS EN81-20.

Compensating ropes, which match the characteristics and design of the compensating pulley and weights, shall be installed. The ropes shall be manufactured and constructed in accordance with the requirements of BS EN12385-5.

Compensating ropes shall be applied in all cases in which the lift car speed exceeds 3.0 m/sec.

In cases in which the lift car speed is less than 3.0 m/sec suitably designed chain compensation may be provided using encapsulated chains ('Whispaflex' or similar approved) together with proprietary fixings and guides, pulleys and/or pit rollers.

In all cases in which the lift car speed exceeds 1.75 m/sec the compensation means shall, as a minimum, be guided at the loop.

In all cases the design and construction of the compensation means, and associated terminations shall be such as to provide a minimum safety factor of 5:1 in relation to the static forces arising.

The entire arrangement shall be painted to an approved colour with the pulley being repainted safety yellow.

The compensating ropes, chains and their terminations shall be installed in full compliance with the manufacturer's instructions and data, a copy of which shall be made available to the Engineer on demand and shall be provided as part of the content of the Operation & Maintenance Manual.

The compensating pulleys and weights shall be guarded in accordance with the requirements of BS EN81-20 and in accordance with the requirements of this Specification.

6.3.12 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 (re-levelling shall remain operative in the case of hydraulically driven lifts) 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 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.

6.3.13 Guide Shoes (Roller)

The lift car and counterweight shall be fitted with fully adjustable roller guide shoes. The design of the shoe shall incorporate a keeper plate to ensure the retention of the lift car and counterweight in the correct relationship to the guide rails in the event of roller, tyre or bearing failure. Contact pressure between the roller tyres and the surface of the guiderails, in all planes, shall be achieved by the provision of fully adjustable external springs in conjunction with slots in the fixing baseplate of the shoe assembly. All bearings utilised shall be lubricated and sealed for life by the manufacturer.

6.3.14 Car Top Inspection Control Station

An Inspection Control Station, which is in compliance with the requirements of BS EN 81-20, and the requirements of BS 7255, shall be installed on the lift car top.

The Inspection Control Station shall incorporate an 'Inspection Control Switch' which is designed in accordance with the requirements of BS EN 81-20. The Inspection Control Switch shall be of bi-stable design and shall be suitably protected against involuntary or accident operation.

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

In addition, the Inspection 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 BS EN 81-20, 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 Car Top Inspection Control Station shall incorporate a stopping device which is designed and constructed in accordance with the requirements of BS EN 81-20.

The Car Top Inspection Control Station shall be designed with a minimum level of protection of IPXXD in accordance with BS EN 60529.

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 Inspection Control Station; or additional switches, incorporated into the Car Top Inspection 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 Inspection 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 Inspection 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 Inspection Control Station.

The Inspection 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 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 Car Top Inspection Control Station if this is located with 1.0 m of the car top entry point or may be a separate device.

Incorporated into the Inspection 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-hour 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 EN 81-20 and BS EN 81-28, shall be incorporated into, or mounted adjacent to the Car Top Inspection Station, together with clear instructions as to its use.

6.3.15 Pit Inspection Control Station

An Inspection Control Station, which is in compliance with the requirements of BS EN 81-20, and the requirements of BS 7255, shall be installed in the lift well pit.

The Inspection Control Station shall incorporate an 'Inspection Control Switch' which is designed in accordance with the requirements of BS EN 81-20. The Inspection Control Switch shall be of bi-stable design and shall be suitably protected against involuntary or accident operation.

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

In addition, the Inspection 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 BS EN 81-20, 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 Inspection Control Station shall incorporate a stopping device which is designed and constructed in accordance with the requirements of BS EN 81-20.

The Mechanic's Control Station shall be design with a minimum level of protection of IPXXD in accordance with BS EN 60529.

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
- 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 Inspection 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 Inspection 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 Inspection Control Stations.

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

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 is located outside of the well, at the pit access landing, 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.

A lift well pit communication system, designed and constructed in accordance with the requirements of BS EN 81-20 and BS EN 81-28, shall be incorporated into, or mounted adjacent to the Station, together with clear instructions as to its use.

6.4 Car Signal and Operating Devices

6.4.1 Car Signal and Operating Devices (Fire Fighting Lift)

All lift car signals, and operating devices shall de designed, constructed and installed such that these shall not register false signals due to the effects of heat, smoke, water or moisture.

All of the lift car signals, indicators and operating devices shall be designed, constructed and installed such as to provide a minimum level of protection in accordance with IPX3 of BS EN60529.

The 'Fire Service Access Level' or 'FSAL' shall be clearly marked on or immediately adjacent to the relevant push button by way of a Pictogram the design of which is set out in BS EN81-72. The Pictogram shall be in a matching white type face to the other markings on the operating panel and in-filled with red epoxy resin.

The car operating panel shall include an indicator reading 'Lift under Fire Service Control' which shall illuminate all the time that the firefighting lift switch is in the on position. The message should not be visible until the indicator is illuminated.

6.4.2 Car Operating Panel (Destination Control System)

Since the destination control system registers calls for intending passengers at destination input devices on the landings there are no car call pushes.

All operating devices shall be incorporated within the side wall of the lift car and integral with it, in a position to comply with Part M2 of the Building Regulations and BS EN 81-70. These shall include a key operated independent service switch, door open push and alarm push buttons. Faceplates will not be accepted.

The car operating panel shall also incorporate a means to register car calls when the lift is switched to Independent service or when on Fireman's control. These controls shall not normally be activated and shall be hidden behind a locked panel but shall automatically become accessible and operable when required.

An indicator showing the allocated destinations of that lift shall be incorporated into the car operating or front return panels to enable intending passengers to check they are entering the correct lift.

Audio-visual indication shall be provided in order to signify 'car overloaded'. The alarm and door open push buttons shall be illuminated under emergency lighting operation. The alarm and door open push buttons shall be the lowest of the push buttons in the lift car in order to aid accessibility.

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

The Alarm button system shall be provided with a 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.

An alphanumeric digital lift car position indicator shall be provided within each lift car operating panel at a height in compliance with BS EN81-70.

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

6.4.3 Car Lighting Supply Monitoring

The lift car lighting supply and controls shall be arranged such that in the event of failure of the normal car lighting supply the lift shall not accept any further car or landing calls whilst in Normal operating mode.

The lift shall complete its current journey and then go out of service upon arrival at the **next stop** and display 'lift out of service' on the car control station and landing indicators.

Firefighters' and Recall operation to BS EN 81-72 and BS EN 81-73 shall override this function.

6.4.4 Emergency Signal (Audible Alarm)

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.

6.4.5 Emergency Signal (Fire Fighting)

Audible and visible indicators shall be provided at each lift machinery space, on the lift car top, and in the lift pit.

The audible and visible indicators shall operate immediately upon initiation of the Phase 1 and only when the lift is under inspection control, under emergency electrical operation and/or under any other maintenance control. The audible and visual indicators shall remain operative until the lift is returned to normal control whereupon the lift shall immediately revert to Phase 1 Fire Control, and the audible and visual signal shall cease.

The audible warning devices 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. This 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.

All of the equipment shall be designed, constructed and installed such as to provide a minimum level of protection in accordance with IPX3 of BS EN60529.

6.4.6 Emergency Auto Dialling (GSM)

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 as amended, shall be provided in each lift car and electrically connected to the machine room/machinery space. The system shall be compatible with operation on a digital line following digital switch over and 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 pre-programmed voice message shall identify the lift number and its precise location. e.g. 'Lift alarm activated on passenger lift 3 at TÜV SÜD House, 95 Spencer Street, Birmingham B18 6DA, 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
- 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) Yellow and green illuminated pictograms as required by BS EN81-28.

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.

6.4.7 Fire Fighting Intercom

The firefighting lift shall be fitted with a permanently installed 'hands free' intercom system to provide interactive two-way communication between the Firefighters lift car and:

- the Fire Service Access Level with the system permanently active (without any requirement for manual intervention and/or push button or other operation) at all times whilst the firefighting control is activated;
- the lift machine room, or in the case of a machine room less lift design at the emergency and test panel. The microphone shall be activated only by the manual pressing of a control button located on the intercom unit;

- other/additional locations as may be determined under the Building Fire Strategy. In the case of other/additional locations the microphone shall be activated only by the manual pressing of a control button located on the particular intercom unit.

The system electrical wiring shall be installed within the lift well.

All of the intercom systems and equipment shall be designed, constructed and installed such that the units and equipment shall be protected to a minimum of IPX3 in accordance with BS EN60529.

6.4.8 GSM Provision

In cases where digital cellular technology (GSM or similar) is provided for the emergency communications system the Lift Contractor shall ensure that any transmitter or extension antenna is located such that sufficient signal strength is available to guarantee reliable connection to a rescue service irrespective of position of the lift car within the shaft.

The Lift Contractor shall include for the supply and installation of all necessary cabling & power supply requirements where necessary to locate the antenna remotely from the emergency communication equipment.

To ensure the optimum network signal is utilized the Lift Contractor shall install and configure the equipment for automatic selection of network operator. Systems which operate on 2G/3G only or with a single network operator will not be accepted.

The Lift Contractor shall include within the operation and maintenance manual all details relating to each SIM card, such as phone number, SIM card identification number, primary network operator, etc.

The Lift Contractor shall include within the maintenance price all costs related to maintaining and operating the SIM card.

6.4.9 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.

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.

6.4.10 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 BS7594 and BS EN60118-4: 2015 and shall be capable of providing a minimum magnetic field strength, over a covered area, of 100mA 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 300mm 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.

6.5 Car & Landing Entrances – Selcom Pegasus

6.5.1 Automatic Power Operation of Car and Landing Doors (with 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. Where an alternative mounting arrangement is proposed it shall only be accepted by prior approval of the Engineer. 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.

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) In the event of the doors being obstructed or held open, then after a pre-determined period, the doors shall close at reduced speed and an audible warning will sound until the doors are closed. The lift shall normally 'park' with the doors closed.

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

i) 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.

j) 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.

k) 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 BS EN81-20 and shall be subject to Type Examination in accordance with the requirements of BS EN81-50 and the Lift Contractor shall provide a Type Examination Certificate which is in accordance with BS EN81-50.

6.5.2 Locking Devices and Switches for Car and Landing Entrances

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 BS EN 81-20 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 BS EN81-20.

All locking devices shall be designed and constructed in accordance with the requirements of BS EN81-20 and shall be subject to Type Examination in accordance with the requirements of BS EN81-50.

Landing entrance interlocks shall be UKCA Marked and Certified in accordance with the requirements of BS EN81-20, BS EN81-50 and the Lifts Regulations 2016 as amended. The Lift Contractor shall provide a valid UKCA Certificate which is to be in accordance with the requirements of BS EN81-50 and the Lifts Regulations 2016 as amended.

The lock circuit voltage shall be given in the Tender Particulars in Section 9 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.

6.5.3 Locking Devices and Switches for Car and Landing Entrances (Fire Fighting Lifts)

In addition to the previous clause, 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 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.

6.5.4 Door Detector - Panachrome

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 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 in Section 9.

6.5.5 Car and Landing Doors (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 and mechanical strength of the lift car and landing entrance door panels and frames shall be such that these meet the requirements of BS EN81-20.

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 BS EN81-20 and BS EN81-50. The Lift Contractor shall provide a Test Report in accordance with BS EN 81-50.

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 BS EN81-20. 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.

6.5.6 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.

6.5.7 Car & Landing Sills

The lift car and landing door sills 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 treadplate 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.

6.5.8 Landing Fascia

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 in accordance with the requirements of BS EN81-20 and such that this is capable of withstanding a force of 300 N applied at right-angles to the fascia, and evenly distributed over an area of 5 cm^2 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.

6.5.9 Architraves (Stainless) – Small Frame Type

Architraves shall be provided at each lift landing entrance at each level served. These shall be manufactured from 16 SWG stainless sheet steel. Following site erection these shall be supported by form work and shall be backfilled with cement grout for a minimum of two thirds of their height.

Side uprights and header members shall be bolted together, and welding will NOT be accepted. The finish and pattern of the stainless-steel material shall be as identified in the Finishes Schedule of this Specification.

The design and construction shall be such as to meet with the requirements of the Lift Contractor's landing entrance fire rating and Fire Certificate.

6.5.10 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.

6.5.11 Landing Signal & Operating Devices (Firefighters Lift)

All lift landing signals, and operating devices shall de designed, constructed and installed such that these shall not register false signals due to the effects of heat, smoke, water or moisture.

All of the lift landing signals, indicators and operating devices shall be designed, constructed and installed such as to provide a minimum level of protection in accordance with IPX3 of BS EN60529.

The landing signal and operating devices shall be arranged so that their failure and/or malfunction shall not affect the operation of the lift in its firefighting mode.

A firefighters lift control unit shall be provided adjacent to the lift within 2 M horizontally, and at a height of between 1.4M and 2.0M above the finished floor level, at the Fire Service Access Level. The control unit shall bear a clear indication of which lift it is associated with and, shall be clearly marked with a Pictogram, the design of which is set in BS EN81-72. The Pictogram shall be in a white type face and in-filled with red epoxy resin.

The control unit shall incorporate the firefighters lift switch, the firefighters intercom and a lift car position indicator for the firefighters lift.

Within the unit the Lift Contractor shall provide two LED's to indicate whether the lift is running on Primary or Secondary power supplies. The electrical signal to these shall be provided by others in a separate termination box at the fire service access level adjacent to the unit. The Lift Contractor shall be responsible for wiring from the termination to the indicators and connecting up.

The fixings shall be vandal resistant secret type to approval. The materials and finish of the faceplates shall match the remaining landing fixtures.

Full details of the unit including illustration shall be provided at the time of Tender.

The operation of the firefighters lift switch shall be by way of an unlocking key the design of which shall be in accordance with the requirements defined in BS EN81-20. The switch operating positions shall be bi-stable and shall be clearly marked '1' and '0'.

When the firefighters lift switch is operated it shall initiate Phase 1: Priority Recall. Upon activation of Phase 1 all the lift safety devices shall remain operational with the exception of any heat and/or smoke sensitive door reversal devices, which shall be disabled. Should the lift at the time be parked at a landing the doors shall close automatically, and at a reduced speed, and an audible warning signal shall be activated during the door closing cycle. The lift shall then travel non-stop to the fire service access level. A lift travelling away from the fire service access level shall stop at the next available floor and reverse its direction, travelling non-stop to the fire service access floor. A lift travelling towards the fire service access level shall travel non-stop to the fire service access floor.

On arrival at the fire service access level the firefighters lift shall remain at that floor with the doors open ready for use by the firefighters under Phase 2 operation.

In addition, the operation of the firefighters lift switch shall initiate the following:

- Automatic illumination of the lift well and all machinery spaces;
- Render inoperative all lift car controls (excepting for the door open and emergency alarm push buttons) and all landing controls and shall cancel all existing calls in the system;
- The firefighters lift shall function independently of all other interconnected lifts;
- The fire service communication system shall automatically be made operative;
- 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 the lift is on inspection control, under emergency electrical operation and/or under any other maintenance control, the audible and visual indicators 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 Phase 1 Fire Control, and the audible and visual signal shall cease.

Under Phase 2 operation:

- it shall not be possible to register more than one lift car call simultaneously;
- it shall be possible, at any time, to register a new call from within the lift car, the previous call being cancelled;
- the lift shall travel in the shortest time to the most recently registered call;
- the application of constant pressure on a car call button or the door close button shall cause the lift doors to close. Release of the button prior to the doors being fully closed shall cause the doors to automatically re-open;
- if the lift car is stationary at a landing it shall be possible to open the doors only by the application of constant pressure on the door open button. Should the door open button be released before the doors are within 50 mm of the fully open position the doors shall automatically reverse and reclose;
- all of the lift safety devices and door reversal devices shall remain operational with the exception of any heat and/or smoke sensitive door reversal devices, which shall be disabled.
- The switching of the firefighters switch at the fire service access level from position '1' to position '0' for a period of 5-seconds, followed by switching to position '1' shall cause the lift to be returned to the fire service access level;
- The registered call shall be displayed visually on the car operating panel;

- whenever power is available the lift car position shall be displayed at the car operating panel and at the firefighting control unit at the fire service access level;
- the lift car shall remain at the destination floor until a new car call is registered or until the car is recalled to the fire service access level;
- the fire service communication system shall remain fully operative throughout Phase 2 operation.

6.5.12 Landing Signal and Operating Devices (Destination Control System)

Destination input devices consisting of either touch screens and/or key pads shall be provided, to enable passengers to register their chosen floor destination. An associated indicator screen will direct passengers to the assigned lift car.

Each lift car shall be identified by an alphabetical symbol installed above each landing entrance which shall project from the wall so as to be clearly visible from all directions. The letters shall be large enough for intending passengers to identify their assigned lift when entering the lift lobby. These lift identification plates shall be fully compliant with BS EN81-70 and designed to match the building décor and other landing furniture and be subject to the Architect's approval.

Destination input devices shall include a means to enable disabled persons to enter their destination and be directed to appropriate lifts that are compliant with the Equality Act 2010. These lifts shall have both audible and visual means of floor destination signalling preferably as part of the lift identification plate.

Destination input devices shall have a design life of at least 1,000,000 operations.

Destination input device mountings and fixings shall be such that the application of a force of 300N of any part of the housing shall not result in any permanent deflection. Each of the units shall be designed so that there are no visible means of fixing.

Each destination input device mounting shall allow for on-site adjustment of screen angle to mitigate screen glare and/or reflections due to local lighting conditions.

Three destination input devices shall be provided at the main floor level and two at all other landing levels with final locations to the approval of the engineer.

6.6 Lift Shaft, Counterweight & Pit

6.6.1 Guides and Fixings (Existing)

The existing lift car and counterweight guide rails and brackets shall be thoroughly cleaned and all dirt, dust and lubricant removed.

The guide brackets shall then be checked for security and horizontal accuracy and the guide rails for plumbness and alignment.

The Lift Contractor shall take appropriate corrective action where errors are identified. Linishing or such other appropriate method shall be applied in order to remove any damage to the machined faces of the guide rails. If, during the course of re-plumbing of the guide rails, it is identified that at the time of the original installation these had been 'tram lined', this must be referred to the Engineer for consideration **before** corrective action is taken.

The Lift Contractor shall check the guide rail section and pitch of fixings to ensure compliance with the maximum deflections detailed in BS EN81-20.

In the case that the Lift Contractor should find that the existing arrangement does not comply with the BS EN81-20 requirements they shall advise at the time of Tender, providing proposals, calculations and costs to rectify the condition.

Under no circumstances will any claims be considered after any Tender is accepted.

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.

6.6.2 Counterweight and Screen (Existing)

The Lift Contractor shall suitably adjust the existing counterweight such that, once the refurbishment of the lift car is complete, and with 45% - 50% of the contract load placed in the lift car, the correct balance shall be achieved.

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 BS EN ISO 13857.

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.

A sign shall be placed on or near the counterweight screen stating the maximum allowed clearances between the counterweight and counterweight buffer when the car is at its utmost landing level in order to maintain the required clearances above the car.

6.6.3 Buffers (Energy Dissipation)

The Lift Contractor shall supply and install energy dissipation (hydraulic) 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 stroke of the buffers shall be not less than the gravity stopping distance corresponding to 115% of the rated speed of the lift. 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 without permanent deformation.

In the case of lift car speeds in excess of 2.5 m/sec, and where terminal slowdown is monitored in accordance with BS EN81-20, the striking speed of the lift car and counterweight may be used to calculate the buffer stroke. However, in no case shall the buffer stroke be less than 0.42 m.

The Lift Contractor shall supply and install all associated steelwork and up-stands 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.

The design of the buffers shall incorporate electrical monitoring switches which shall prevent operation of the lift unless the buffers are in their fully extended condition. The switches shall be design and constructed in accordance with the requirements of BS EN81-20

Each buffer shall incorporate readily accessible means of checking the fluid level together with a permanently fixed data plate which sets out the name of the manufacturer of the buffer; the number of the associated Type Examination Certificate; the type of the buffer; and the type and designation of the hydraulic fluid.

A Certificate of Type Test, in accordance with the requirements of BS EN81-50, shall be provided in relation to energy dissipation buffers.

6.6.4 Buffers (Fire Fighting Lift)

In addition to the above the buffer condition electrical monitoring switches shall be water proof to IP67 rating in order to ensure that the lift remains in firefighting service even if the pit is flooded.

6.6.5 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 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.

6.6.6 Limits and Switches (Fire Fighting Lift)

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.

6.6.7 Stop Switches (Pit)

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 BS EN81-20 and shall be of mushroom headed, 'push to stop, pull to release' type.

6.6.8 Stop Switches (Fire Fighting)

In addition, the design of the stop switches in the lift well pit shall be water resistant to IP67 and shall be designed, constructed and installed such as to prevent lift failure in the event of the lift pit becoming flooded.

6.6.9 Pit Communications

A communications unit shall be provided in the lift well pit which will enable two-way communication with a permanently manned rescue service in the event of a person being trapped in the lift pit.

The unit shall meet with the requirements of BS EN81-20.

The communication device may form part of the lift car trapped passenger and lift 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 of 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.

6.7 Electrical Installation Method

6.7.1 Electrical Installation Method (Pre-loomed LSZH)

The Lift Contractor shall install all necessary wiring, trunking and conduit for the lifts from the main riser termination point.

All wiring must comply with the current Edition of BS 7671 of the IEE Regulations where applicable.

All wiring, including trailing flexes, shall be insulated with halogen-free low smoke emission insulation, in compliance with BS 7211, BS EN50525-1 and BS50525-3

Any wiring which is exposed and vulnerable during normal maintenance (i.e. control panel to shaft, car top, pit and machine room), shall be mechanically protected to prevent damage.

All travelling cables in the shaft and on the car shall be supported by purpose made clamps or suspension devices. Excessively tight bends will **not** be acceptable.

All cables shall be obtained from an approved manufacturer. Only one make of travelling cable shall be used in this installation.

Any coil of cable or travelling cable manufactured more than twelve months prior to delivery on site will not be accepted. The Lift Contractor may be required to furnish satisfactory evidence of the date of batch manufacture of any coil.

Where round flexes are fitted, prior to termination on the car they shall be hung, suitably weighted and free to rotate in order to relieve these cables from any tendency to twist during service.

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 plugs and sockets shall be permanently and indelibly factory labelled to show the plug and corresponding socket.

Where trailing cables are suspended from a point above halfway, restraints shall be fitted between the suspension anchorage and the halfway point to eliminate the possibility of the trailing cable moving into the path of the car or counterweight. Any such restraints shall allow vertical movement of the trailing cable to accommodate stretch.

Provision shall be made within the travelling cables for any specialist conductors necessary for the car communication system.

All travelling cables shall be delivered on a cable reel and stored in site in a cable rack protected from moisture.

Travelling cables delivered in loose coils and subject to kinking shall be rejected.

The Lift Contractor shall include for connection of all extraneous metalwork to earth bonding and lightning protection systems terminated in the lift pits.

6.7.2 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.

All of the earth points shall be identified using coloured tags.

6.7.3 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.

6.8 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.

6.9 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 9 of this Specification, the proposed methods which they propose 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.

6.10 BRE Environmental Assessment Method (BREEAM) for Buildings

The lift system shall meet the criteria for best practice in sustainable design and hence contribute to the environmental performance of the building. All of the following features shall be incorporated into the lift installation to maximise the award of BREEAM credits:

- Provision of PIR or standby control of car lights and ventilation fan to ensure automatic shutdown when not in use.
- Provision of low energy LED lift car lighting or similar low energy light fitments with an average luminous efficacy across all fittings in the car of > 70 luminaire lumens per circuit Watt
- Standby mode on controllers and drives to reduce power consumption to a minimum during periods of inactivity.
- Variable Voltage Variable Frequency Regenerative drives.

SECTION 7

COMMISSIONING, ACCEPTANCE PROCEDURE AND SERVICE MANUALS

7 COMMISSIONING, ACCEPTANCE PROCEDURE AND SERVICE MANUALS

7.1 Commissioning and Acceptance Procedure

The Lift Contractor shall agree a full commissioning and testing programme with the Engineer. Prior to offering the installation to the Engineer for acceptance tests, the Lift Contractor shall carry out full tests in compliance with the requirements of BS 8486, BS EN81-20, BS EN81-50, the Lifts Regulations 2016 as amended and the specific requirements of the Specification. Any defects identified during or arising from the Lift Contractor's inspection and testing shall be remedied prior to the installation being offered for acceptance tests. The Lift Contractor shall further ensure that the whole installation fully satisfies the design criteria and functionality in accordance with the requirements of the Specification.

The Lift Contractor shall make complete records of the tests utilising test sheets, which shall be in full compliance with BS 8486. In the case of a modernisation of existing installations the Lift Contractor shall provide **additional** updated test sheets in the form applicable to the original installation of the lift.

The Lift Contractor shall be responsible for providing all of the instruments necessary to undertake the commissioning and the tests as required by the Engineer, including, but not limited to, test weights, thermometers, noise and vibration measurement devices, induction loop test unit, electrical test meters, force measurement gauges, deflection gauges and jigs, all of which shall be accurately calibrated and accompanied by current (within 12-months) Calibration Certificates, and to the satisfaction of the Engineer.

The Lift Contractor shall provide the Engineer with not less than five full working days prior notice of their intention to offer the installation for acceptance tests. The Lift Contractor shall confirm this in writing.

The Lift Contractor shall be responsible for all the tests to ensure the proper function and operation of the lift under this Contract. Prior to acceptance and placing into service the lift shall, under the supervision of the Engineer, pass all of the tests detailed within this Specification or as may be required by the Engineer during commissioning.

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 and RCD test.
f) Earth continuity resistance test.
g) Full load, full speed safety gear test.
h) Ascending car overspeed test.
i) Full load and empty car test of the unintended movement protection device.
j) Brake test full load and redundant shoe/disc test.
k) Buffer test carried out with contract load and at contract speed.
l) Overload test (electrical).
m) RCD electrical protective device tests.
n) Electrical protective device tests.
o) Levelling device tests.
p) Car balance tests.
q) Noise and vibration tests as specified.

r) Fire Recall systems

s) Firefighting, disabled evacuation and communication system tests.

In cases where the veracity and/or strength of the mechanical design of elements of the lift structure and/or lift equipment or components under the requirements of BS EN81-20 and BS EN81-50 are determined by the assessment of material deflection the Lift Contractor shall, at the request of the Engineer, demonstrate compliance as part of the commissioning tests, providing all tools and test equipment required to demonstrate compliance.

The Lift Contractor shall also carry out any other tests required by the Engineer in order to prove that the equipment complies with the requirements of the Contract and with all codes and Regulations relating to the equipment supplied and its installation under the Contract.

The Lift Contractor shall generally demonstrate the lift in operation under various loading conditions from no load to 25% overload in order to check the operation and floor levelling accuracy.

The lift shall also be subject to a 60-minute test such as to prove the adequacy of all components in terms of achieving the rated duty and minimum starts per hour. The test shall be conducted with the lift 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 of 10 seconds maximum duration and with the doors operational. During the test, the equipment should not overheat, spark excessively, become noisy or operate in a faulty or deficient manner.

All the tests shall be carried out in the presence of the Engineer and the results shall be recorded in a tabulated form for easy checking and reference with the form signed by the Lift Contractor's representative undertaking the tests.

Health & Safety File and Service Manuals

The Lift Contractor shall provide a separate Health & Safety File as is required under the CDM 2015 Regulations, including residual risks, risk assessments, COSHH data, accident records and all 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 requirements of the Lifts Regulations 2016 as amended, BS EN13015 and all applicable UK Regulation.

Duplicate copies of the Manuals, which shall be in full compliance with the requirements of BS EN13015 and the requirements of this Specification, shall be provided and these shall include the following:

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 or in relation to the equipment and to 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 wear and tear. The minimum information provided shall ensure that ordering of replacement components can be achieved.
- Maintenance schedules detailing all areas of planned preventative maintenance, routine servicing and including all settings and adjustments together with control and component software parameters.

- Wherever any hand held, or portable device is used to service, interrogate, alter, modify, adjust, reset and/or recalibrate the lift system and/or components the Lift Contractor shall supply one of these devices for each lift together with clear instructions for the use of the device and all necessary data sheets for the interpretation of information shall be included. The device shall be supplied free of license for the duration of the life of the lift installation, and free of any hire, lease, rental or servicing charges.
- Full details of recommended methods of cleaning all finishes, including any special materials required.

Test Certificates

The Lift Contractor shall supply a minimum of two copies of the BS 8464 test sheets together with the site test certificates in respect of the tests carried out at the time of commissioning of the equipment. These shall 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 (Each certificate identified with its lift number)

c) Overspeed governor

d) Hoisting motor

e) Lift machine brake and brake monitoring

f) Door gear motor

g) Car and counterweight buffers

h) Safety gears lift car (ascent and descent) and counterweight

i) Unintended movement protection

j) Reports of pendulum tests relating to lift car and landing entrances and doors, lift car enclosure panels, shaft enclosure panels and any glass panels.

k) Fire Certificate for lift landing and car doors

l) Lifting beam or eyes (where applicable)

m) Electrical completion certificate to BS 7671

n) UK Certificate of Conformity for the lift installation

o) UK Certificates of Conformity complete with annexes for all of the lift safety components.

Drawings and Circuit Wiring Diagrams

The Lift Contractor shall provide a full set of electrical circuit diagrams which shall incorporate any and all amendments which have been carried out prior to the equipment being accepted by the Engineer.

The Lift Contractor shall supply a complete set of wiring and ‘as built’ drawings in respect of the completed lift installation.

The Lift Contractor shall supply a complete set of builders work and general arrangement drawings, including landing entrances and lift car interior perspective.

The ‘as-built’ drawings shall record details of any significant residual hazards and risks affecting the installation, the works and the design, which could not be eliminated and/or adequately mitigated in the design, on the final ‘as built’ record drawings and in the H&S File.

Inspection Certificates

This section shall be provided for the future retention of Inspection Certificates in accordance with SAFed Recommendations.

Maintenance Contract and Inspection Reports

This section shall be provided for the future retention of maintenance reports and the maintenance contract documents.

Warranties & Guarantees

Each Manual shall include copies of the manufacturer's or supplier's guarantees or warranties in relation to products as described in the Preliminaries Section of this Specification.

7.2 Commissioning (Fire Fighting)

The operation and functions of the Fire Fighting lift shall be fully checked and tested in accordance with the requirements of BS EN81-72, BS9999 and BS EN81-73.

The Manuals provided with the lift shall form part of the handover documentation and shall include descriptions of the behaviour of the lift in the event of fire and the instructions in relation to use of the lift under BS EN81-72, BS9999 and BS EN81-73.

Noise & Vibration Tests

Where specified, carry out a Lift Noise & Vibration test to verify the performance criteria detailed in Section 9 have been met.

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 as described in BS ISO 8100-34 at 1.5m from the floor and approximately 1m from the door face.

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.

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 as defined in BS ISO 8100-34. Measurements are to be made, using an approved measuring instrument which satisfies the requirements of BS ISO 8100-34 and has a valid calibration certificate. Measurement of noise and vibration levels shall be made 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 at least 0.5s before the doors start to close at one level, to at least 0.5s after the completion of door opening at the final level.

Vibration levels are to be measured in mg, as peak to peak values and shall be frequency weighted with the whole-body **x, y** and **z** weighting factors and band limiting as defined in ISO 8041.

Acceleration, deceleration and jerk rates shall also be measured in accordance with BS ISO 8100-34 and confirmed.

7.3 Handover Procedure

Prior to offering the equipment for acceptance, the Lift Contractor shall ensure that all works identified during the witness tests as remedial items have been satisfactorily completed and that the Operating and Maintenance Manuals with complete with all Certification and the complete CDM 2015 H&S File are available.

Should the handover be delayed because remedial items are outstanding, the commencement of the Defects Liability Period shall be deferred until such time as all outstanding works and items are complete to the satisfaction of the Engineer.

At handover, the Lift Contractor shall provide for the Purchaser's use the following:

a) 3 sets of keys for each key switch on each lift installation.

b) 3 landing door release keys.

c) A typed document, which is encapsulated in plastic, providing full details of the Lift Contractor's local and national emergency breakdown and call out procedure inclusive of phone numbers.

Levels of acceleration, deceleration and jerk rate shall also be measured and recorded.

SECTION 8

MAINTENANCE

8 MAINTENANCE

8.1 Maintenance and Continuity of Lift Service During the Works

The following provisions and duties will form part of the contracted Works.

- On the date of possession, the Lift Contractor shall assume full responsibility for the condition and safe operation of all of the lifts until such time as their duties under the Contract are wholly discharged.
- Dismantling of equipment and all removals and replacements shall be carried out by the Lift Contractor as part of the Works and shall be so undertaken as to maintain continuity of lift service at all times.
- Maintenance of the existing lift/s during the site works shall be undertaken by the Lift Contractor who will provide a service corresponding to the requirements of the Comprehensive Form of Maintenance Contract as detailed in this Specification.
- On completion of each lift, and upon the dismantling of the next lift, the newly completed lift will be made available for general use and the maintenance service corresponding to the requirements of the Comprehensive Form of Maintenance Contract, as detailed in this Specification, shall be applied to that lift. These arrangements shall remain in place and continue until the completion of the Works and the commencement of the Defects Liability Period.

The Defects Liability Period is to be deferred and will not commence until the final lift is complete and commissioned.

8.2 Comprehensive Form of Contract

8.2.1 Maintenance

Multiple Lifts

On the date of possession, the Lift Contractor shall assume full responsibility for the condition and safe operation of all of the lifts until such time as their duties under the Contract are wholly discharged.

Dismantling of equipment and all removals and replacements shall be carried out by the Lift Contractor as part of the Works and shall be so undertaken as to maintain continuity of lift service at all times.

Maintenance of the existing lift/s during the site works shall be undertaken by the Lift Contractor who will provide a service corresponding to the requirements of the Comprehensive Form of Maintenance Contract as detailed in this Specification.

On completion of each lift, and upon the dismantling of the next lift, the newly completed lift will be made available for general use and the maintenance service corresponding to the requirements of the Comprehensive Form of Maintenance Contract, as detailed in this Specification, shall be applied to that lift. These arrangements shall remain in place and continue until the completion of the Works and the commencement of the Defects Liability Period.

The Defects Liability Period will not commence until the final lift is complete and commissioned.

The Lift Contractor shall provide for monthly maintenance visits and repair service in full compliance with the Comprehensive Form of Contract, for the duration of the Defects Liability Period.

At monthly intervals throughout the Defects Liability Period the Lift Contractor shall provide computer generated reports in relation to breakdowns and call outs for the previous period, with detail of each breakdown.

Maintenance Provision from Point of Signed Contracts – Optional Cost

The Lift Contractor shall provide an optional cost to undertake all maintenance and breakdown provisions from the date of signing of the contractors until modernisation works commence on the first lift. The cost shall include for monthly service visits under a basic contract. All attendances for lift failures and replacement parts shall be chargeable.

8.2.2 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 negligence and/or misuse or abuse.

b) Cleaning of the lift shaft fabric and enclosure walls.

c) Buried piping and cylinders which are located below the level of the pit floor on hydraulic lifts.

d) The incoming electrical mains power supply cable to both power and lighting circuits in connection with the lift installations.

e) Failure of the lift equipment due to misuse with such repairs, where established as due to misuse, will be chargeable as an extra to the Contract.

Included in the Lift Contractor's responsibility is the provision of all labour and materials required for the correct adjustment, repair and/or replacement, as conditions warrant, of all other component parts of the lift installation which are not specifically excluded here above.

Lifts shall be subject to monthly maintenance visits during the 24-month warranty maintenance period.

Attendances to lift failures shall be included within the tendered sum 24/7.

Cleaning of all equipment in the lift machine room, machinery spaces, lift shaft and lift pit, such as to ensure that the areas and equipment are kept clean at all times and free of rubbish and potentially inflammable material.

Provision of all cleaning materials and the correct lubricants, which are in accordance with the equipment manufacturer's specifications, such as to ensure the correct maintenance of the lift equipment. No stocks of lubricating oil or lubricants of an inflammable nature are to be retained on site at any time.

Whenever the lift is not available for service due to this being in the control of the Lift Contractor during works or inspections, the Lift Contractor shall provide a suitable barrier at each lift entrance under inspection to indicate that the installation is not available for service. A sample design of the barrier shall be submitted for approval to the Purchaser's Representative. When not in use, the barrier shall be retained in the lift machine room or machinery space and mounted on purpose made brackets, or at an agreed location on the site. At the expiry of the maintenance contract, the barrier shall remain as the property of the Purchaser. The barrier shall be collapsible in design, painted safety yellow and be fitted with a suitable 'DANGER' notice and designed and constructed in accordance with the requirements of BS7255.

'Out of service' indication notices shall be placed on each landing whenever a lift is removed from service for either maintenance or repair.

The lift contractor shall include for the replacement of all rechargeable batteries included within the lift system, including (but not limited to) controllers, intercoms, emergency lighting, emergency brake release or recovery systems within the time periods and/or dates recommended by the

manufacturer/supplier. The lift contractor shall provide a schedule of recommended replacement periods with the contract.

The lift contractor shall include for all SAFed supplementary tests as defined in Section 5 Annex A of the Guidelines on the supplementary tests of in-service lifts 2020, issued by the Safety Assessment Federation and endorsed by the Health & Safety Executive.

Test No.	Supplementary Test
A1	Earth Continuity
A2	Electric Safety Devices
A3	Terminal Speed Reduction Systems
A4	Landing Door Interlocks
A5	Lift Machine – Investigatory Test (Type A)
A6	Lift Machine – Comprehensive Test (Type B)
A7	Overspeed Governors
A8	Governor Operated Safety Gear – Instantaneous Type
A9	Governor Operated Safety Gear – Progressive Type
A10	Safety Gear Operated by Other Means
A11	Devices to Prevent Overspeed of Ascending Car
A12	Unintended Car Movement
A13	Energy Dissipation Buffers
A14	Suspension System
A15	Car Overload Detection Warning Devices
A16	Hydraulic System
A17	Hydraulic Cylinder in Boreholes or Similar Location
A18	Hydraulic Rupture/Restrictor Valves
A19	Electrical Anti-creep Device
A20	Mechanical Anti-creep Device (Pawl or Clamp)
A21	Low Pressure Detection Devices
A22	Traction, Brake & Levelling
A23	Car/Counterweight Balance
A24	Automatic Power Operated Doors
A25	Other Supplementary Tests

On completion of an Examination, two original signed certificates shall be provided; one copy for the Client's file, the other to be displayed within the maintenance records, by the Lift Contractor.

A reasonable stock of replacement lamps, LED luminaires and fluorescent tubes for use within the motor room, machinery spaces, lift shaft, lift car and all indicators and push units shall be retained in the lift machine room and/or machinery space.

Within one month following each maintenance visit a Report shall be forwarded to the Purchaser's Representative. All reports shall:

a) Relate to one visit to each of the lifts.

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 visit.

c) Certify that the lift is in a satisfactory safe and serviceable condition, or in the alternative suitably advise the Purchaser's Representative.

d) Give details of attendance to any breakdowns during the period since the date of the preceding Report.

The Lift Contractor shall include for providing full instruction as to the running and operation of the lifts to the Purchaser's appointed staff, including safe passenger release and emergency hand-winding/lowering procedures. Each person trained shall be issued with a Certificate by the Lift Contractor. This training shall be carried out annually under the Maintenance Contract.

The Lift Contractor shall include for annual re-programming of the auto dialler.

The Comprehensive Contract shall include for operational guarantees by the Lift Contractor to the Employer for:

a) 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 occurred

3 hours – outside normal office hours where no trapping has occurred

b) Guarantees against failure. This will be a maximum number of:

5 failures per lift, per annum maximum.

c) The Lift Contractor shall refund to the Purchaser as financial compensation a sum equivalent to 1% of the contract sum for the lift for each failure above the agreed rate. This provision shall be operational immediately following the 12 months Defects Liability Period.

d) Repair and replacement component availability to be stated, including an agreed schedule of 'down' time.

e) Maintenance during agreed periods as determined by the Purchaser's requirements.

f) Rebate in full, or rescheduling, at the Purchaser's discretion, of any missed maintenance visits.

g) Maintenance visits planned and advised in advance by means of annual planner provided at handover.

h) 6 sets of encapsulated details to be provided at handover giving full details of contact procedure for trappings, breakdowns and routine maintenance.

9 CONTRACT AWARD CRITERIA

60% Quality/40% Price.

10 SOCIAL VALUE

The Lift Contractor shall detail what social value outcomes will be delivered through the contract and how these outcomes will be delivered.

The outcomes must be measurable and reported on as part of overall contract management. Please note that social value statements forming part of your tender submission will form part of the contract obligations and are therefore required to be delivered, like any other contractual obligations.

For this tender, the social value outcomes which could be created include:

- In-kind donation to local charity.
- Skills and career development support sessions delivered in local community asset (school, community centre, church).

TENDER

Liverpool City Region –
Mann Island Lift Replacement

Qualitative Response Document

Guidance:

Bidders should consider the information presented in the procurement documents and give responses to the questions in this section that demonstrate how the bidder's proposal meets the requirements of Liverpool City Region Combined Authority.

In responding, the bidder is expected to present its response in a narrative form, covering all points listed and giving examples as it sees fit. Bidders should only include examples where they are relevant and pertinent to matters being referred to in the response to this RFQ.

For sections that require a written response, you may make the section for your response bigger to fit the response. Responses should be relevant to the questions asked and presented in a concise manner: please refrain from supplying generic promotional material.

Where an attachment is required, please enter the document name and attach the document along with this document to the Quality Section on the Chest project.

Total quality evaluation weighting: 60%

No.	Question	Form of Response	Weighting
1.	Describe how your organisation will ensure full compliance with the technical specification sections 2, 3, 4, 5, 6, and 7 from the design stage through to installation and commissioning. The response shall include detail of the following key components so as an assessment can be made of the quality of the proposed technical solution. Complete Appendix B - Tender Particulars.	Written Response / Attachment	15%
Written response to Q1 / Please state name of file if an attachment: The Appendix B Tender Particulars are also attached separately.			

At time of tender enquiry the specification is closely reviewed to ensure understanding of whats being asked for and all engineering and logistical aspects that need to be considered. A short over view of same is produced for when site survey is arranged.

Attendance to site arranged with the main supplier to ensure they have full understanding of requirements site specific and avoid any oversights or mistakes. Close liaison between the Rubax project engineering team, design team and manufacturer help to produce the best quality and commercially most sensible solution in which to compile a robust offer that will provide a long term operationally reliable solution.

Correct and detailed assessment of layout drawings ensure there are no engineering delays and more importantly no engineering mistakes or significant problems discovered after site commencement that will have an impact on program and handover.

Equipment to be provided is open protocol, industry proven and heavily engineered. All have UK based product support and have been used by Rubax for over 10 years and hence come with known and proven high levels of technical, reliability characteristics.

As an overview based on submission;

NEW LIFT FST2 controller and signalisation being TFT 110 displays (spares for both held at Rubax Head Office in Warrington)

NEW LIFT DHC screens

Elevision remote monitoring capability available to client and Rubax technical team

Ziehl- Abegg Gearless machines

Ziehl- Abegg VF Drives included for efficiency, high reliability and

Car balance ARD included for ease in emergency situations

Closed Loop digital shaft positioning

Robust purpose designed mechanical/steel work packages to suit lift car size and weight

Bespoke car finishes as either specified or agreed including heavy duty floor covering

Open protocol Dewhurst US range pushes (off the shelf/van stock and sensibly costed if damaged requiring replacement)

Selcom Pegasus door system, added CAT 1 security for robustness.

Aluminium steel sills are robustly supported with additional brackets where required.

Spare hanger rollers, shoes, air-cords are all engineer van stock and spare door motor and control board are Head Office stock items.

All have UK based representation and field operatives that can provide hands on technical support if required and as Rubax have such long standing working relationships also have direct contact with the main Manufacturer facilities and management in Germany for a higher level of technical insight, training and knowledge

Site installation is managed daily by the lead engineer who has a copy of the specification of work and regular site visits by the Rubax Project Manager ensures site safety, correct working practices are being adhered too, progress is in line with program and that all aspects of work are in parallel with the specification and offer of works. Progress reports are typically provided to the client and consultant every fortnight unless there is a site progress meeting held whereby specifics will be discussed and exampled, sometimes buy photo on the computer so all can see progress.

On the latter stages of the project/each lift, the site engineers will inform the Rubax PM as to when they will be ready to commence domestic test and set up and then one of the Rubax NVQ4 test engineers will be assigned to attend site to commence setting up works, functionality checks and dynamics in line with BS5655, EN81 and Lift Regulations and generating an internal snag list of items requiring attention, completion or correction in line with the specification of works and Rubax's own internal high standards of finish. When all internal domestic testing and commissioning is nearing completion a request for consultant witness test is arranged by the Rubax PM. On the agreed date the lead engineer, test engineer and PM will meet the consultant to go through thorough dynamic, system and aesthetic checks.

Any snagging items that can be addressed there and then are so and any others are agreed to be carried out at a date perhaps after the lift has entered service but to be agreed by the Consultant and client and then signed off and photo evidenced as complete by Rubax Test engineer or PM. In the unlikely event of a significant issue, this would be addressed prior to the lift entering service and the DOC (Declaration of conformity) being issued, where applicable and faulty components replaced and returned to the relevant manufacturer under warranty. The same applies during DLP, with all components and support of the equipment being covered under contract and supported by local in house engineers.

No.	Question	Form of Response	Weighting
2.	Provide a detailed RAMS for the installation as detailed in the specification sections 2, 3, 4, 5, 6, and 7 showing activity from start up to handover of each individual lift and an end-to-end programme for the total lot showing all areas/phases of the works. Please upload any supporting documentation such as programmes, reports, organigram, training matrix that would be relevant to the project to support your answer.	Written Response / Attachment	15%

Written response to Q2 / Please state name of file if an attachment:

Works in Compliance with CDM Regs 2015

The project will have its own specifically produced Construction Phase Plan that will be compliant with the requirements of CDM regs 2015 and will detail all key aspects of works and health and safety and risk management will be applied and managed, who is responsible, site contacts and responsibilities/position (Principle Designer etc), emergency procedures and locations, communication channels etc.

The various phases of CDM are then covered so that all parties are clear on their roles and responsibilities from Concept Phase through to Handover/Post Construction Phase and for Rubax as Principal Contractor, our specific role and responsibilities and how we intend to both deliver and manage them along with a clear record thereof.

Program length for each lift is as indicatively as outlined in the technical & commercial return documents.

Receipt of order & Mobilisation

Rubax are well experienced, nearly 40 years, in delivering successful modernisation and replacement projects in live buildings and with varying site specific circumstance and have carried out such works for other similar schemes such as Port of Liverpool, India Buildings, Tithebarn House, Wythenshawe Hospital, Manchester Northern, Manchester Met University etc;

An overall company organogram is attached, Appendix 2a 25-26 Organization chart.

At the time of instruction a specific sequence/process commences and involves several members of the overall team who will handle the scheme from cradle to grave;

• Director – Dave Verey (over 25 years in the lift industry), will oversee the works and consult with the team of what the projects consists of

• Project Manager – Mike Verey(over 35 years in the lift industry, NVQ4), will familiarize himself with the property, working environment and specification

• HSEQ Manager – Laura Rose (over 20 years in a Health & Safety Role) – will develop the Construction Phase Plan (CPP)

• Lead Design Engineer – Aaron Heath (20 years in the Lift industry)– will carry out technical surveys and produce detailed shaft construction GA's

• Project Administration/co-ordination – Leanne Gardener Over 7 years with Rubax)– logistics, orders, communications and site arrangements with suppliers

For this to flow & progress correctly, in agreement of Merseytravel, a site survey is organised and attended by the Project Manager, Design Engineer and HSEQ Manager to ascertain site specific information, photographs and plan of works based around individual site circumstance and customer/tenant expectations who will be in the premises during the works. This ensures that any plans and site lay out are correctly communicated in advance to help/ensure customer satisfaction and avoid any complaints. At this time as well as technical survey of the shaft and landings to establish dimensions, required builders works and possible up front planning with Merseytravel of moving any live services such as smoke detectors, fire alarm points, cctv on landings that maybe with the hoardings etc are identified and resolve planned in advance.

With the guidance of the Project Manager and Design Engineer the HSEQ Manager is briefed on work methodology and requirements in order that correct and specific RAMS can be formulated with adequate control measures in place along with bespoke specific site information such as welfare facility, storage, delivery times and routes etc so this can be discussed and agreed with Merseytravel before final compilation of the RAMS and CPP. All of this would form not only part of the CPP but an integral part of the site inductions to ensure all operatives are fully aware of specific site circumstances.

Program length/activity & Communal Areas

Program length will be dictated by number of floors served and potentially individual shaft builders works but site times and activities will follow the same path and duration and as indicated in the technical Section returns within the submission. Activity steps would be;

Receipt and logging of order

Internal review meeting with team members as above

Liaison with Merseytravel & Consultant to agree sequencing of sites to be worked on and then agreement for attendance and access to conduct full technical surveys

Production of shaft GA's and info sharing with manufacturers to agree final design elements and any required builders works

PO issued to manufacturers

Receipt of engineering drawings from the Manufacturer reviewed internally for correctness under a 4 eye principal (i.e. at least two people review and agree correctness) and cross referenced with envisaged building work requirements foreseen

Engineering GA's supplied to consultant for review

Once signed off by Consultant Rubax PM or Director sign off drawings to manufacturer and lead in time window starts for manufacturer and delivery

Program then produced and issued to all by Rubax PM/Project Co-ordinator

Continued liaison with manufacturers and suppliers through production time frame.

Circa 10 weeks before delivery, the Rubax team look at labour planning

Engineering team selected and advised and specification shared and discussed along with arrangements made for Rubax PM to take engineers to site for familiarisation and iron out any design/technical queries in advance and agreement of RAMS

Fabrication and building contractor/scaffolder advised of project dates and requirements from them

Pre start meeting held with Merseytravel and consultant on site, perhaps 5-6 weeks before start

Communal areas are assessed and appropriate control measures agreed to suit the working environment. From this agreed times of material movement may be established, noisy works and agreed access routes for all parties to abide by.

Site rules in the communal areas are agreed and supported with signage and barriered off areas as maybe applicable and are the Rubax site teams responsibility to be maintained but also checked by the Rubax PM on site visits.

Similar in nature the Rubax lead engineer will be responsible for dynamic daily checks to ensure hoarding security, no trip hazards and all Rubax responsible areas of work are secure and hazard free/controlled.

Engineers or any representative of Rubax will have appropriate Logo PPE along with ID badges.

Any hazards identified are to be reported to site where possible and Rubax PM/Merseytravel and works stop if so required until the risk has been suitably addressed. (this is a very rare scenario)

Minor consumables ordered 2 weeks before start by Project Administrator, this is approved by Rubax PM.

1st day on site hoardings erected, CPP placed on site, site diary commenced, site introduction as required and safety signage put in place.

Works carried out in line with RAMS and Rubax PM visits to monitor

Design team and PM assist site engineers if queries arise

Lift is domestic tested and snagged

Offered for witness test when complete and handed over with the Director issuing the Declaration of Conformity (for complete replacement) on day of entering service

Any snagging works are completed and signed off within 2 weeks and the lift is then supported under DLP as per specification, with calls and service included and supported by local field engineers.

Communication & escalation

Initial communication, info sharing and co-ordination will be handled by meetings and co-operation between the Rubax PM & Director, Lift Consultant and the Merseytravel team involved in agreeing process and planning in advance of execution and then the involvement of the site to share the plans and process and adapt where practical to specific requests and queries to ensure seamless delivery for all parties. From this collaborative approach, work approach/methodology and control measures are adopted on a per site specific basis and built into the specific RAMS and CPP for the site.

In the event of an issue or shortfall being identified then work is to stop as required and the issue communicated to all while assessment and control is implemented. This will likely require a site meeting with Rubax and Lift consultant and possibly Merseytravel. Any amendments are issued as variations to the CPP and an alternate method of approach agreed and communicated between all parties.

Some of the wider field team envisaged/planned to be a part of have a snap shot of their training matrix status (Appendix Q2c Training Matrix) by way of progression and continual improvement for expertise and safe working which helps drive the extremely good accident statistics also attached as Appendix Q2d Accident Statistics.

A specific CPP would be produced for Merseytravel for this project before commencement and would take the format as indicated in Appendix Q2b sample CPP, the same produced and worked to in busy hospital major lift project recently.

No.	Question	Form of Response	Weighting
3.	Explain how you will support the installation during the procurement phase, if required, the construction phase, section 2 and during the warranty maintenance period, section 8.	Written Response / Attachment	10%

Written response to Q1 / Please state name of file if an attachment:

Existing Lifts & Then DLP/Service Support

All clients and field resource has access to a manned 24/7 call centre to handle calls and dispatch them to the most appropriate person/operative.

In terms of technical support during the warranty period, our current directly-employed resource levels across this region are:

- Field engineers – 19 (average time served in field 18 years)
- Repair engineers – 4 men (two two-man teams for immediate response and quality control)
- Technicians – 3 in the North West Region
- Some sample Qualifications of engineers/technicians, Directors to be involved and HSEQ Manager are attached as Appendix Q3.

Planned preventative maintenance visits and call-outs would be attended by local field engineers. They would also carry out any minor repairs.

Larger repairs would be carried out by our two two-man repair teams led by Ray Smith with over 35 years industry experience.

Higher-level technical support for breakdowns/fault finding would be provided by the regional technicians:

- Karl Delaney
- Chris Wilkinson
- Peter Muir

It should be noted that the existing equipment is OEM specific but as the existing equipment is provided by Rubax's parent company (Rubax operates as a completely separate stand alone company and field staff are employed by Rubax and equipment offered for the project all 3rd party respected and established open protocol components) then we will have the additional benefit of direct technical support if required and fast track identification and receipt of replacement components for the old equipment until replaced.

Anticipated response times:

- Entrapments – 30-45 minutes, maximum
- Breakdowns (normal working hours) – maximum two hours, typically 60-90 mins
- Breakdowns (out of hours) – two hours

Our policy is to only fill 70% of our engineers' allocated work time with planned preventative maintenance visits.

This safeguards our ability to deliver contractual KPIs and meet response times.

The remaining 30% 'buffer time' means that, if there are any emergency situations or repairs that take longer than expected, our engineers have flexibility to adjust their work schedule accordingly.

On call regional rota so there will always be an engineer available in the area to respond to call-outs when required.

There is also a Duty Manager on call to handle any out of hours emergencies or escalations.

In the event of any sudden shortfall, such as illness or unforeseen holiday periods, we would call on the support of additional engineers from elsewhere in the city or neighbouring regional teams.

This approach works. In the last 12 months our average response times (24/7) for the team that would be supporting Mann Island were as follows:

- Entrapments – 27 minutes
- Breakdowns – 1 hour 21 minutes*

*= please note for the majority of regional contracts we are working to self-imposed SLAs of 60 minutes and 3 hours, so we know we can deliver the response for you when you need it, where you need it.

All vehicles are fitted with real-time tracking devices so that, at a click of a button, Rubax office can see at a glance which engineer is where and who can attend in the shortest time.

This avoids unnecessary delay, enabling us to achieve SLA time after time.

SPARES/COMPONENT REPLACEMENT

There are a number of key and consumable components that Rubax keep as both rolling van stock and Head Office spares ensuring high levels of 1st time fix or minimal downtime. The replacement of rolling stock is managed and overseen by Purchasing, Service Management and Project Management within the Rubax team. With Rubax using a limited number of suppliers for project work, this not only enhances in house knowledge and technical understanding of the equipment but also standardisation of spares held, though to be clear, it is highly unlikely that any new equipment fitted will need to be replaced either during the course of the works or DLP.

If a failed component is not held locally then the strong ties with the UK based suppliers can be called upon for both fast response, correct component identification and priority delivery from the factory which typically will be 24-48 hours from time of order.

As eluded to above, we will be in a strong position to liaise with the OEM of the equipment being replaced and as such have knowledge and guidance of any critical spares that should be kept during the works until all the old equipment is changed out.

Communication

The Project Manager for the scheme will always be the primary contact for Merseytravel team but from a service and callout/repair perspective he will be further support by the Regional Manager Steve Carson and the Head Office Service Desk and Key Accounts team to ensure that updates and responses are always free flowing and the Mersey travel team are always up to speed with plans and timelines be it via email, phone call or site meeting.

Field worksheets, both PPM and reactive are completed in real time by the field engineers and on completing the job as detailed worksheet is sent electronically to the nominated email addresses provided by Mersey Travel during mobilisation.

No.	Question	Form of Response	Weighting
4.	Drawing on your previous experience from similar occupied environments, provide what you consider are the key risks in this project. Detail any particular challenges you expect to	Written Response / Attachment	10%

	encounter and how you intend to address them.		

Written response to Q1 / Please state name of file if an attachment:

A lift replacement project always has high risks associated with the works if not correctly approached and work methodology followed to mitigate and minimise the risk. Being a live Building and working environment, further potential risk has to be considered for both the Rubax operatives and employees/visitors to the property. The key risks are identified, listed and managed in the RAMS/CPP but will typically all into certain categories;

Asbestos – should not be an issue due building type/age

Deliveries & Storage

Storage will be identified and agreed as part of the mobilisation & pre start meet, ideally a storage container spot confirmed but envisaged as staged out of hours delivery. Due to environment, the staged deliveries will be agreed with the manufacturers and suppliers to ensure as much as practical goes into the lift shaft/hoardings on delivery. This will be communicated in good time with the Merseytravel teams to ensure no conflict of interest. It is envisaged that out of hours deliveries will be organised & also allow free and safer movement of the components through the building to the lift shaft.

Waste Management & Removal

All materials are disposed of in official and traceable manner, through recycling, specialist waste collection or waste notes

Waste oil is collected form site by a specialist agent

Scrap metal is segregated and collected by a local scrap merchant

General waste is placed in a holding area on site (as assumed no skips) and collected by an approved agent who provides a waste note via a official web portal

Hazardous waste is transported back to head office, under a waste transit note, for correct storage until collection/official disposal, such as old fluorescent light tubes etc

Completing the replacements consecutively.

A specific construction crew would be allocated, Liverpool based. They would be long term experienced associates of Rubax with a proven track record and all necessary industry qualifications and certificates of competence, as outlined in the Appendix Q3 folder. Similar, approved specialist suppliers such as scaffolders, builder and Fabricators would be advised and secured. As part of the mobilisation process on contract award, the labour and any specialist trades would be identified and secured in advance to meet program start dates/completion. In house Test/Commissioning engineers allocated in advance to ensure timely sign off and handover. Such approach has been delivered on several schemes over the years, not least on some of the local buildings such as Port Of Liverpool, Cunard Building, India Building and Tithebarn House.

Communication & escalation

Initial communication, info sharing and co-ordination will be handled by meetings and co-operation between the Rubax PM & Director, Lift Consultant & Merseytravel team involved in agreeing process and planning in advance of execution and then the involvement of the site teams to share the plans and process and adapt where practical to specific requests and queries to ensure seamless delivery for all parties. From this collaborative approach, work approach/methodology and control measures are adopted on a per site specific basis and built into the specific RAMS and CPP for the site. Landing Hoardings will also provide communication via poster for foot traffic over what is being done and why.

In the event of an issue or shortfall being identified then work is to stop as required and the issue communicated to all while assessment and control is implemented. This will likely require a site meeting with Rubax & Lift consultant & possibly Merseytravel. Any amendments are issued as variations to the CPP and an alternate method of approach agreed and communicated between all parties.

Potential impacts on the programme, such as defects or unforeseen delays.

Significant risks are, late delivery, incorrect components, damage, labour. Our procurement strategy is designed to maximise resilience across our supply chain, we have developed & stuck with certain suppliers & manufacturers based upon not only the quality & reliability of the equipment provided but also their ability and willingness to deliver on time, correct components & logistics company that also add dependability & reliability to arrive at site when arranged.

Correct up front in house design teams mitigate against incorrect components/design issues & delays and working with long term proven construction crews engaged and arranged many weeks in advance along with site preparedness ensures seamless progress & minimises risks.

Specific people risks are;

Lifting and transport of heavy equipment

This is best managed via technique and vast experience of the planned operatives, correctly certified/tested lifting equipment and trolley trucks to avoid manual handling injuries. Suitable and agreed access routes are prepared and appropriate segregation via barriers and warning signage is put in place as well as out of hours planning were required.

Fall protection

Controlled by robust hoardings to avoid unauthorised access but also secondary fall protection for anyone entering the hoardings. Correctly installed, tagged and inspected scaffolding is used and lanyards and harnesses used where applicable and required.

Electrical hazards

Dealt with by using only appropriate and certified tools that are PAT tested, equipment is only worked on live when required and correct lock and tag out procedures followed the rest of the time to prevent inadvertent activation.

Moving equipment and uncontrolled movement

Can lead to cuts and trapping injuries is controlled by working process, good communication on site between operatives and dynamic risk assessment from the engineers to identify and mitigate placing themselves at any risk and ensuring correct control of shorts in the safety circuits and LOTO plays a part of this also.

COSHH

Controlled and managed by upfront assessment of the product by the Rubax HSEQ manager but also engineer awareness and ensuring in the event of spillage, the spill kit which forms part of any site hit along with fire extinguisher and first aid kit.

Suitable and sufficient welfare facilities

Essential for the work force and on these projects and it is assumed facilities will be made available for use and will be kept clean and tidy by the Rubax operatives.

No.	Question	Form of Response	Weighting

5.	Read the Social Value Specification and complete the Social Value Tender Submission Template.	Written Response / Attachment	10%
Written response to Q1 / Please state name of file if an attachment: Uploaded separately as - 7. Mann Island Lift Replacement - Social Value Tender Submission - Rubax Lifts			

Mann Island Lift Replacement

Social Value Tender Submission

Please complete this template and return as part of tender submission.

Instructions for Completion

Bidders are **required** to complete the following sections as part of tender submission:

- Contract Details
- Contract Social Value Requirements

Bidders are welcome to deliver social value measures additional to the minimum requirement. Please complete the following section to outline any proposed additional social value delivery:

- Additional Social Value

Contract Details

Contract Name	Replacement of Mann Island Lifts
Contract Timeframe	Based on the current plan to complete one lift at a time we anticipate a timeframe for the project of 60-70 weeks
Supplier Name	Rubax Lifts Limited

Contract Social Value Requirements

Complete the following tables for each social value measure specified in tender specification

NT	Measure	Amount
NT1	No. of full time equivalent direct local employees (FTE) hired or retained for the duration of the contract	Six
Delivery		
Securing this prestigious installation project would help to safeguard the employment of six local FTEs for the duration of the contract. These would be involved not only in the direct installation of the new lifts but also working very closely on the project to monitor each phase of the programme, provide technical support and ultimately complete all testing of the lifts prior to completion and handover.		

Delivery Schedule
Based on the current plan to complete one lift at a time we anticipate a timeframe for the project of 60-70 weeks. The direct involvement of each FTE will vary during the course of the installation programme according to role and areas of responsibility. Once the contract has been awarded and a firm schedule established we will be able to provide an initial forecast. This can then be revised and reported as the project unfolds.
Evidence
We will provide confirmation of the number of employees engaged on the project at each stage with details of hours worked and in what capacity.
Evidence Schedule
We can be flexible on this, either providing the above information at predetermined intervals during the installation programme or alternatively submitting evidence once all the lifts have been commissioned and handed over.

Additional Social Value

Complete the following table for each measure you propose to deliver additional those specified in the tender specification

NT	Measure	Amount
NT11	No. of hrs supporting unemployed people into work	16
Delivery		
Our National Sales Manager, Steve Watkins will support local unemployed people back into work. To achieve this we will liaise with job centres in the Liverpool area to set up one-to-one mock interviews. This will benefit long-term job seekers who are either inexperienced at attending interviews or perhaps lack confidence.		

If the job seekers are preparing for a specific opportunity the interview will be tailored to that role and business sector. Our general approach is to use competency-based questions.

Steve has worked in a number of sales and management roles within the lift industry, as well as having wide experience in other industry sectors. He has also completed a City & Guilds qualification in teaching basic adult literacy and numeracy.

He has previously delivered this social value theme very successfully whilst working for another lift service provider.

Delivery Schedule

The plan will be to schedule two eight-hour sessions – we anticipate being able to support six job seekers at each session. (The 16 hours under "Amount" do not take into account preparation time and collating evidence of delivery)

We are open to when these sessions are scheduled during the project period, and will aim to be flexible to support the needs of the Icoal job centre(s)

Evidence

Our HR team will produce a report confirming the dates and locations of the sessions, the number of hours and attendees.

We can also include any notes taken by Steve during the interviews. These would, of course, be anonymised

Evidence Schedule

We can be flexible on this, either providing the above information after each session has been completed or alternatively submit evidence of both sessions at the end of the lift replacement project.

NT	Measure	Amount
NT12	No. of weeks spent on meaningful work placements (unpaid)	Two

Delivery

We will liaise with schools and colleges in the Liverpool area to identify students interested in experiencing what it is like to work in our sector.

We will then offer two one-week placements during the lifetime of the lift replacement project.

Because our office is in Warrington we anticipate this will be field-based shadowing field engineers whilst they carry out planned maintenance and reactive work.

If a student is able to commute to Warrington we could extend this to include an office-based work placement working with/shadowing one of our administrators, the sales team or key account team.

This is an excellent opportunity for students to not only experience working life but also gain an understanding of what it is like to work on an engineering environment, specifically within the lift industry.

Delivery Schedule

We are open to when these sessions are scheduled during the project period, and will aim to be flexible to support the the academic timetable.

Evidence

Our HR team will produce a report confirming the dates and locations of the placements.

We can also provide details of the work experience so that the student can add this to their CV when they are ready to apply for a job.

Evidence Schedule

We can be flexible on this, either providing the above information after each of the two weeks has been completed or alternatively submit evidence of both placements at the end of the lift replacement project.

Pricing Sheet Lift 1 (Lift A)

SUMMARY OF PRICES - TOTAL COSTS FOR NO.1 LIFT	
All prices to be net and fixed for the duration of the contract programme	
Contract Preliminaries	£500.00
Compliance with CDM 2015 Regulations	£97.00
Approved Body Approvals	none ID'd at tender
Compliance with BS EN81-20 & 50, Lifts Regulations 2016 as amended	Included
Design, Manufacture, Deliver, Install and Commission	£218,750.00
Removal of Existing Equipment	included
Builders Work	£29,250.00
Electrical Work	£3,250.00
Additional price for ARD (Specification Paragraph 6.2.13)	Included
TOTAL	£ 251,847.00

MAINTENANCE		
Price for basic maintenance contract from point of contract signing to newly completed Lift being available for general use ('Pre-Defects Liabilty Period Maintenance')	£102.50	per month
Maintain Lift Equipment from newly completed Lift being available for general use to the expiry of the Defects Liability Period ('Defects Liability Period Maintenance')	£580.00	one-off fixed cost
Comprehensive Maintenance after expiry of Defects Liability Period ('Post-Defects Liability Period Maintance')	£1,700.00	per annum

LEIA INDEX AT TIME OF TENDER	
Contracts	5.44%
Maintenance	7.11%

Pricing Sheet Lift 1 (Lift A)

We undertake to execute any works specifically authorised to be charged at daywork rates at net cost plus the following percentages:

Labour	Plus £134p/h
Fares & Allowances	Inclusive
Materials	Plus 20 %
Plant	Plus 15 %
Sub-Contractors	Plus 20 %

NOTE:

On-costs include establishment charges and all insurance and holiday with pay contributions.
Labour to be wages of work people (i.e. chargehands, fitters and mates, but not weekly or monthly paid Person in Charge, Supervisors, Draughtsperson, Store person and Clerks) based on trade union rates including overtime and payments in respect of travelling based on time or distance.
Allowances will comprise outworking lodgings, out of pocket expenses and dirty money payments. Fares and allowances for broken days are to be calculated on the percentage of a full week's labour excluding overtime.
Materials to be at net cost (delivered to site) and after deducting all discounts.

The Lift Contractor shall enter below the net basic labour rates on which the tender is based and shall add rates of any work people which it is proposed to bring onto site.	**Normal Working Hours**		**Out of Normal Working Hours**	
	a	**b**	**c**	**d**
	Between 0800-1700	**Between 1700-1900**	**After 1900 hrs & Saturday**	**Sundays & Bank Holidays**
Fitter	£81 p/h	£ 81 p	£ 113 p	£130 p/h
Mate	£53 p/h	£53 p	£ 76 p	£87 p/h
C/hand	£88 p/h	£88 p	£ 129	£ 150 p/h
Specilists Contractor enhancement	?	?	?	?

Pricing Sheet Lift 2 (Lift B)

SUMMARY OF PRICES - TOTAL COSTS FOR NO.1 LIFT	
All prices to be net and fixed for the duration of the contract programme	**£**
Contract Preliminaries	£500.00
Compliance with CDM 2015 Regulations	£97.00
Approved Body Approvals	none ID'd at tender
Compliance with BS EN81-20 & 50, Lifts Regulations 2016 as amended	Included
Design, Manufacture, Deliver, Install and Commission	£218,750.00
Removal of Existing Equipment	included
Builders Work	£29,250.00
Electrical Work	£3,250.00
Additional price for ARD (Specification Paragraph 6.2.13)	Included
TOTAL	£251,847.00

MAINTENANCE		
Price for basic maintenance contract from point of contract signing to newly completed Lift being available for general use ('Pre-Defects Liabilty Period Maintenance')	£102.50	per month
Maintain Lift Equipment from newly completed Lift being available for general use to the expiry of the Defects Liability Period ('Defects Liability Period Maintenance')	£580.00	one-off fixed cost
Comprehensive Maintenance after expiry of Defects Liability Period ('Post-Defects Liability Period Maintance')	£1,700.00	per annum

LEIA INDEX AT TIME OF TENDER	
Contracts	5.44%
Maintenance	7.11%

We undertake to execute any works specifically authorised to be charged at daywork

Pricing Sheet Lift 2 (Lift B)

Labour	Plus	£134p/h
Fares & Allowances	Inclusive	
Materials	Plus 20	%
Plant	Plus 15	%
Sub-Contractors	Plus 20	%

NOTE:

On-costs include establishment charges and all insurance and holiday with pay contributions
Labour to be wages of work people (i.e. chargehands, fitters and mates, but not weekly or
Allowances will comprise outworking lodgings, out of pocket expenses and dirty money
Materials to be at net cost (delivered to site) and after deducting all discounts.

The Lift Contractor shall enter below the net basic labour rates on which the tender is based and shall add rates of any work people which it is proposed to bring onto site.	**Normal Working Hours**		**Out of Normal Working Hours**	
			c	**d**
			After 1900 hrs & Saturday	**Sundays & Bank Holidays**
			£ 113	£130 p/h
			£ 76	£87 p/h
	a	**b**	£ 129	£ 150 p/h
	Between 0800-1700	**Between 1700-1900**	?	?
Fitter	£81	£ 81 p/h		
Mate	£53	£53 p/h		
C/hand	£88	£88 p/h		
Specilists Contractor enhancement	?	?		

Pricing Sheet Lift 3 (Lift C)

SUMMARY OF PRICES - TOTAL COSTS FOR NO.3 LIFT	
All prices to be net and fixed for the duration of the contract programme	**£**
Contract Preliminaries	£500.00
Compliance with CDM 2015 Regulations	£97.00
Approved Body Approvals	none ID'd at tender
Compliance with BS EN81-20 & 50, Lifts Regulations 2016 as amended	Included
Design, Manufacture, Deliver, Install and Commission	£218,750.00
Removal of Existing Equipment	included
Builders Work	£29,250.00
Electrical Work	£3,250.00
Additional price for ARD (Specification Paragraph 6.2.13)	Included
TOTAL	£251,847.00

MAINTENANCE		
Price for basic maintenance contract from point of contract signing to newly completed Lift being available for general use ('Pre-Defects Liabilty Period Maintenance')	£102.50	per month
Maintain Lift Equipment from newly completed Lift being available for general use to the expiry of the Defects Liability Period ('Defects Liability Period Maintenance')	£580.00	one-off fixed cost
Comprehensive Maintenance after expiry of Defects Liability Period ('Post-Defects Liability Period Maintance')	£1,700.00	per annum

LEIA INDEX AT TIME OF TENDER	
Contracts	5.44%
Maintenance	7.11%

We undertake to execute any works specifically authorised to be charged at daywork rates at net cost plus the following

Labour	Plus £134p/h	
Fares & Allowances	Inclusive	
Materials	Plus 20	%
Plant	Plus 15	%
Sub-Contractors	Plus 20	%

NOTE:

On-costs include establishment charges and all insurance and holiday with pay contributions.

Labour to be wages of work people (i.e. chargehands, fitters and mates, but not weekly or monthly paid Person in Charge, Supervisors,

Allowances will comprise outworking lodgings, out of pocket expenses and dirty money payments. Fares and allowances for broken days are

Materials to be at net cost (delivered to site) and after deducting all discounts.

Out of Normal Working Hours	
c	**d**
After 1900 hrs & Saturday	**Sundays & Bank Holidays**

Pricing Sheet Lift 3 (Lift C)

The Lift Contractor shall enter below the net basic labour rates on which the tender is based and shall add rates of any work people which it is proposed to bring onto site.	Normal		£ 113	£130	p/h
	Working Hours		£ 76	£87	p/h
	a	b	£ 129	£ 150	p/h
	Between 0800-1700	Between 1700-1900	?	?	
Fitter	£81	£ 81	p/h		
Mate	£53	£53	p/h		
C/hand	£88	£88	p/h		
Specilists Contractor enhancement	?	?			

Pricing Sheet Lift 4 (Lift D)

SUMMARY OF PRICES - TOTAL COSTS FOR NO.4 LIFT	
All prices to be net and fixed for the duration of the contract programme	**£**
Contract Preliminaries	£500.00
Compliance with CDM 2015 Regulations	£97.00
Approved Body Approvals	
Compliance with BS EN81-20 & 50, Lifts Regulations 2016 as amended	included
Design, Manufacture, Deliver, Install and Commission	£218,750.00
Removal of Existing Equipment	included
Builders Work	£29,250.00
Electrical Work	£3,250.00
Additional price for ARD (Specification Paragraph 6.2.13)	included
TOTAL	£251,847.00

MAINTENANCE		
Price for basic maintenance contract from point of contract signing to newly completed Lift being available for general use ('Pre-Defects Liabilty Period Maintenance')	£102.50	per month
Maintain Lift Equipment from newly completed Lift being available for general use to the expiry of the Defects Liability Period ('Defects Liability Period Maintenance')	£580.00	one-off fixed cost
Comprehensive Maintenance after expiry of Defects Liability Period ('Post-Defects Liability Period Maintance')	£1,700.00	per annum

LEIA INDEX AT TIME OF TENDER	
Contracts	5.44%
Maintenance	7.11%

We undertake to execute any works specifically authorised to be charged at daywork rates at net cost plus the following

Labour	Plus £134p/h	
Fares & Allowances	Inclusive	
Materials	Plus 20	%
Plant	Plus 15	%
Sub-Contractors	Plus 20	%

NOTE:

On-costs include establishment charges and all insurance and holiday with pay contributions.

Labour to be wages of work people (i.e. chargehands, fitters and mates, but not weekly or monthly paid Person in Charge,

Allowances will comprise outworking lodgings, out of pocket expenses and dirty money payments. Fares and allowances for

Materials to be at net cost (delivered to site) and after deducting all discounts.

Out of Normal Working Hours
c

Pricing Sheet Lift 4 (Lift D)

				After 1900 hrs & Saturday
The Lift Contractor shall enter below the net basic labour rates on which the tender is based and shall add rates of any work people which it is proposed to bring onto site.	**Normal**			£ 113 p/h
	Working Hours			£ 76 p/h
	a	**b**		£ 129 p/h
	Between 0800-1700	**Between 1700-1900**		?
Fitter	£81	£ 81	p/h	
Mate	£53	£53	p/h	
C/hand	£88	£88	p/h	
Specilists Contractor enhancement	?	?		

Appendix B - Tender Particulars

Tender Particulars – Machine Room-less Lift

The Lift Contractor must submit the following information at the time of Tender.

Technical and Constructional Details of Equipment

The Tenderer shall supply the following information.

COMPLIANCE WITH STANDARDS		**Based on lifts A, B & C**
In addition to compliance with the requirements of the Lifts Regulations 2016 as amended, BS EN81-20 & BS EN81-50 the Lift Contractor shall confirm compliance in full with the following:		
BS EN81-70 Accessibility		**YES**
BS EN81-71 – Vandal Resistance – Category 1		**NO**
BS EN81-71 – Vandal Resistance – Category 2		**NO**
BS EN81-72 – Fire Fighting	**LIFT D**	**YES**
BS EN81-73 – Fire Recall		**YES**
BS EN81-21 – Existing Building (Lift Contractor to include details of headroom & pit refuge space safety provisions)		**YES**
Compliance with NHS HTM 08-02		**N/A**
BASIS OF LIFT DESIGN		
Passenger Lift to BS EN81-20 & 50		**YES**
Passenger Lift to BS EN81-20 & 50 (with Mobility Scooter loading)		**YES**
Goods Passenger Lift to BS EN81-20 & 50		**NO**
Lift Car Capacity		**1000kg 13Pers**
Speed		**2.5 m/s**
Car Dimensions		**W x 1100MM D x 2100MM**
LIFT MACHINE		
Machine bearers, type and size		**Machine Frame**
Method of vibration isolation		**Tiko pads**
Type and size of pockets or pad stones required for support		**N.R**
METHOD OF EMERGENCY OPERATION		
Manual means		**Remote B.R**
Electrical means		**A.R.D into next floor**
MOTOR		
Type, including Trade Name Rating in HP or kW		**ZA Gearless @ 26.4kw**
Speed in RPM		**252**
Duty Cycle (starts per hour)		**240**
Heat output at full load/duty		**<0.78kw**
F.L. starting current		**Est @ 84A**
F.L. running current		**Est@ 69A**
Power factor		**0.91**
Name of manufacturer		**Ziehl Abegg**
MOTOR PROTECTION		
Type, state number of protective devices		**CP monitor and in line stats**
Time for protection to trip on stall		**Site set**
REGULATOR		
Manufacturer		**Ziehl Abegg**
Reference		**Zetadyn 4CS**
Type		**Full vector**
Rating		**Est @ 53A**
Starting Current		**Est @ 37A**
F.L running current		**Est @ 27.3A**
Power factor		**0.89**
UKCA marking		**Yes**
Regeneration to mains?		**YES**
Maximum regeneration current		**Est @ 36A**
TRACTION AND DIVERTER SHEAVES		
Maximum suspended load on drive sheave		**Est @ 5000kg**
Traction sheave diameter		**450mm**
Diverter sheave diameter		**Est @ 380mm**
Calculated Safety Factor		**12:01**
BRAKE ASSEMBLY		
Number of brake shoes		**Discs**
Number of springs		**As EN**
Coil voltage and current		**207 Volts 1.9 Amps**
Manufacturer		**Mayr-Roba**
OVERSPEED GOVERNOR		
Method of remote tripping/resetting		**Remote**
Electrical trip speed		**As EN**
Mechanical trip speed		**As EN**
Rope diameter and construction		**6mm o/l**
Manufacturer and type No.		**PEB200**
CONTROLLER		
Location		**Floor Level tba**
Entrance Frame / Front Wall / Other (provide details)		**TBA**
Dimensions		**1.7H X 110mm W**
Manufacturer		**New Lift**
Type		**FST 2XT**
Voltage		**400-24V**
Method of achieving lamp reliability		**LEDs**
Expected life of solid-state components		**25 years**
Method of temperature monitoring		**External Stats**
Heat output		**<0.37kw**
UKCA marked?		**Yes**
Programming/Interrogation Device provided to be Purchaser?		**YES**
GUIDE SHOES		
Make and type		**ELCO roller**
Dimensions of guide shoe		**//**

Diameters of rollers (if applicable)	150mm
Method of self-adjustment	Spring loaded
Method of lubrication	N.R
BUFFERS	
Car: type and number	1 No Hydraulic
Counterweight: type and number	1No Hydraulic
CAR AND FRAME	
Total weight of car and sling	Est @ 1050kg
Load weighing devices, type and number	1 no Electronic
Method of car balancing	Pre balanced
Method of car body isolation	TIKO upstands
Maximum weight of car finishes	Incl above
SAFETY GEAR	
Description	Progressive
Makers name and type number	Atwell VG Range
UNINTENDED MOVEMENT	
Means of detection	Monitor on OSG
Means of prevention	Application of brake
Stopping means	Application of brake
SUSPENSION ROPES	
Number and diameter	7 @ 10mm
Tensile strength	As test cert
Construction and lay	Drako 250T
Breaking force per rope/chain	As test cert
Method of rope isolation/equalising	Adjustable anchors
Current selling price per/M rope/chain/belt	£5.30
COMPENSATION (IF FITTED)	
Type	Plastic chain
Manufacturer	Whisper flex
Method of anchorage isolation	Nylon guides
Method of restraint in pit	Fixed rollers
CAR ENCLOSURE	
Name of supplier/manufacturer	Century Fabricatons
Number of car top refuge spaces	1
MECHANICS CAR TOP CONTROL STATION	
Name of supplier/manufacturer	New Lift
Model of car top emergency light	Within module
Model of car top socket outlet	Within module
MECHANICS LIFT PIT CONTROL STATION	
Name of supplier/manufacturer	New Lift
Number of pit refuge spaces	1
PIT ACCESS LADDER	
Name of supplier/manufacturer	Existing
BS EN81-20 Design Type (Type 1, 2a, 2b, 3a, 3b or 4)	Existing
DOOR OPERATOR/DOOR EQUIPMENT	
Make and type number	Selcom pegaus*
Method of car/landing coupler	Retractable clutch
Rated starts per hour	300
Life expectancy of belts if used	//
AC or DC	VVVVF
Method of speed control and adjustment	Site set
Opening speed (std)	3s
Type of car door lock	Selcom
UKCA marked?	YES
Means of emergency release	Manual
Closing speed (std)	4s
Pre-opening?	Optional
Method of isolation from car bodywork	TIKO upstands
Method of self-closing	Spring
Minimum clear opening width	800 mm
Minimum clear opening height	2000 mm
Landing door BS EN 81-58 fire certificate rating	Yes 2hr
DOOR SAFETY DEVICES	
Type of landing lock	Selcom
Voltage of lock circuits	220V
UKCA marked?	Yes
Emergency release type	Euro
Means of releasing lowest lock from within the lift pit	Steel cable
DOOR SAFETY DEVICES	
Type of landing lock	Selcom
Voltage of lock circuits	220V
Firefighters Lift Lock IP rating	As spec
Emergency release type	Euro
Means of releasing lowest lock from within the lift pit	Steel cable
DOOR PROTECTIVE DEVICE	
Manufacturer and reference	Memco panachrome
Number of beams	98
Extent of detector field on to landing	Site set
Location of device (door edge/ back of sill)	Side of car doors
LIMITS AND SWITCHES	
Type and make of limit switches	Schmersal
Type and make of positioning system	Mechanical
AUTO RECHARGE UNITS	

Make and type number	**Within CP**
Total power output in watt/hours	**5W per hr**
Consumption of emergency lighting	**Self contained**
Consumption of alarm bell	**3W**
MAINS SUPPLY	
Main switch type and rating	**Hager Est @ 100A**
Fuses type and rating	**Est @ 63A HRC**
Mains riser rating and construction	**isting to be tested within tender ofer**
WIRING	
State method of wiring and protection	**Galvanised trunking an dconduits**
Shaft wiring LSZH	**YES**
TRAVELLING CABLES	
Type of trailer and construction	**PVC flatfrom**
Manufacturer	**Datwyler**
Number of ways	**Up to 24**
Make of travelling cable	**PVC**
Make of anchorage system	**PVC taper wedge**
LSZH	**YES**
PUSHES AND FIXTURES	
Manufacturer and reference of landing call units	**Dewhurst**
Location of braille/tactile markings illumination method	**push**
IPX rating	**/**
Manufacture and reference of position / direction indicators	**Dewhurst**
IPX rating	**/**
Manufacture and reference of car operating panel	
IPX rating	**/**
Grade of material and finish	
Manufacturer and reference of Fire Fighting Intercom	**Windcrest**
Manufacturer and reference of Disabled Evacuation System	**Windcrest**
Lift Contractor to supply illustrations and descriptions of all units in the supporting documents.	**Yes within O&M manual**
VOICE SYNTHESISER	
Manufacturer and model	**New Lift**
Method of voice reproduction	**chip**
Maximum number of messages	**64**
On site re-programmable?	**in part**
Location of speaker	**COP**
Location of inductive loop	**COP**
AUTO DIALER	
Manufacturer and model	**Windcrest EN4**
No. of numbers	**5**
Message enunciator	**Optional**
Line requirements	**GSM (included)**
Speaker/Mic location	**COP**
ADDITIONAL INFORMATION	
Safety Component Type Test Certification	

Component	Brake	Governor	Safety Gear	UCM Device	Buffer	PESSRAL Devices	Doors
Approved Body Number	**Contained within O&M Manual**						
Certificate Number							
Certificate Date							

LEIA Member	**YES**
Constructionline Member No.	**7056**
Quality system certification	**ISO9001:2015**
Environmental system certification	**ISO14001:2018**
Premises where a similar installation may be viewed and performance characteristics as given in 9.2 be checked	**Many within the Liverpool area**
Forecast of life of the installation based on anticipated usage	**30 years**
MAXIMUM HEIGHT OF EQUIPMENT	
(a) Hoisting unit	**415mm**
(b) Controller cabinet	**1.7m**

This Schedule must be completed in every particular, signed and dated and returned with the Tender. Any deviations from the Specification and any other information relevant to the Tender shall be set out by the Lift Contractor on a separate sheet as an additional Schedule of Particulars.

Appendix B - Tender Particulars

Performance Characteristics

This section must be completed by the Lift Contractor with a view to its incorporation within a future maintenance agreement. Completion of the lift installation will only be accepted if the performance of the system conforms to the information below.

TIME VARIABLES	
Time for doors to open with advance door opening	**3 secs**
Time for doors to close	**4 secs**
Acceleration time from standing to full speed based upon a rate of acceleration of	**Site set**
Deceleration time from full speed to standing	**Site set**
PASSENGER TRANSFER TIMES	
Loading (per person)	TBC on floor plate
Unloading (per person)	Dims and per floor occupancy
Probable number of stops	
Interval time morning peak	
Average round trip time	
Handling capacity in 5-minute period (no of passengers)	

Noise and Vibration – Machine Room-less

State **expected** levels of noise and vibration in the various conditions. The Lift Contractor shall be expected to provide all necessary instrumentation to demonstrate these criteria are met.

Minimum Standards Acceptable	**Minimum**	**Expected**
Noise level in shaft 1m from motor under all load conditions	65 dBA	65 dBA
Car interior fan on	55 dBA	55 dBA
Car interior fan off	50 dBA	50 dBA
1m from landing doors on landing during lock engagement	55 dBA	55 dBA
Acceleration rate **Site set**	1.0 m/s^2	m/s^2
Jerk rate **Site set**	1.5 m/s^2	m/s^2
Vibration in car ISO Filtered mg		
Maximum Peak to Peak Vertical	12 mg	12 mg
Maximum Peak to Peak Horizontal	10 mg	10 mg

Appendix B - Tender Particulars

Structural Loadings - Traction

Horizontal force X (Kilo Newtons) due to thrust of guide shoes on front face of guide rail at any one fixing.	**TBC ON GA DRAWINGS**
Horizontal force Y (Kilo Newtons) due to thrust of guide shoes on side face of guide rail at any one fixing.	
Downward force Z (Kilo Newtons) due to operation of safety gear imposed on any one fixing.	
Reaction (Equivalent Dead Load) on pit floor under any one guide rail due to operations of the car safety gear.	
Reaction (Equivalent Dead Load) on pit floor under any one buffer due to car buffering.	
Number of buffers	
Reaction (Equivalent Dead Load) on pit floor due to counterweight buffer.	
Number of buffers	2

Appendix B - Tender Particulars

Project Team

PROJECT MANAGER	
The Project Manager for the project will be (Name)	Mike and David Verey
The Project Manager is based at (full address)	Wilson House, Crab Lane, Warrington Cheshire WA2 0XP
Project Managers Qualifications	B.Eng & NVQ4
Frequency of Site Visits of Project Manager	2 times per week
	8 times per month
PROJECT DESIGN ENGINEERS	
The Project Design Engineer for the project will be (Name)	Aaron Heath
The Project Design Engineer is based at (full address)	Birmingham Office
Does the Company have Full Quality Assurance to Annex IX to the Lifts Directive?	Yes

Appendix B - Tender Particulars

Production Schedule

To be completed by the addition of the appropriate program dates and returned with the Tender.

Date of order instructions to proceed	Week 0
Lift car construction and design drawings submitted to Contract Administrator	Week 6
Commencement of materials procurement	Week 3
Commence deliveries to site	Week 19

The Lift Contractor, in completing this Schedule, is to state the most favourable deliveries and programme they are able to achieve. It should be noted that in evaluating the submitted Tender, programme and delivery will be taken into account.

Appendix B - Tender Particulars

Schedule of Site Works

	No. of Days Per Lift
Anticipated Labour on Site **Engineer & Assistant**	
Fit entrance protection hoardings	
Dismantle and remove all redundant equipment from site	
Builder's and electrical work	
Align guides	
Install car sling and platform	
Install new hoist machine	
Install new entrances	
Fit all shaft switches and fit landing signalisation	
Trunk tube and wire lift shaft	
Refurbish counterweight/car slings and safety gear and fit main suspension ropes	
Refurbish lift car and fit all internal and external equipment	
Fit landing fascia and all covers	
Clean down, paint and lubricate	
Final adjustments and domestic testing	
Witness tests	
Special requirements (if any)	
Total working days per lift	80

Total number of person days on site (CDM 2015 Regulations) **160 days**

The Lift Contractor is to provide separate method statement fully detailing the operations to achieve these periods.

Appendix B - Tender Particulars

Schedule of Working Hours

The Lift Contractor is to insert in the Schedule the starting and finishing hours for their operations to achieve the periods detailed in the Schedule of Site

Monday - Friday	**0800 am**	**1730 pm**
Saturday	**am**	**pm**
Sunday	**am**	**pm**

Appendix B - Tender Particulars

Schedule of Work to be Sub-Let

This Schedule must be completed and returned with the Tender.

Failure to comply may disqualify the Tender.

The Lift Contractor is to give below the names and addresses of those firms to whom it is proposed to sub-let portions of the work not normally carried out by themselves.

This Schedule shall not be subsequently modified without prior permission in writing from the Engineer.

The Engineer reserves the right to reject any proposed sub-contractor and to request an alternative.

The Lift Contractor shall provide copies of invoices from vendors or sub-contractors at the Engineer's request, showing an agreed-on cost as indicated.

15%

Name and address of proposed Sub-Contractor	**Work to be sub-let of proposed Sub-Contractor**
Century Fabrications. Chesterfield	Lift cars (A,B,C) & shaft fascias
	PUWER
PD Building Services, Manchester	All building and decoration works

Appendix B - Tender Particulars

Deviations from Specification

The Lift Contractor shall list any deviations from the specification in the schedule below.

Deviations from the required contractual or technical content of this specification tender shall be scored accordingly in the tender appraisal.

Where no deviations are listed 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 later requests for deviation will be considered.

Clause of Specification Deviated From	**Description of Deviation**
3.12	Within optional cost for this element of works as shaft access was restricted, we have included for a budget cost of £10k for the builders & structural engineers work
5.2	Schedule of equipment - Lift D due to design restrictions lift D has been included for complete replacment to full fire fighting standards
6.5.9	Excluded form our tender offer
6.7.1	Within our tender offer we have included for galvanised trunking and conduits throughout each installation
6.2.21	Within our tender costs we have included £25k to cover this requirement - this sum will