



Custom House and London City Airport Escalator Repair Works

2018-055-01

Contract

Lump Sum Contract with Activity Schedule

Docklands Light Railway Limited and Kone PLC



FORM OF AGREEMENT

THIS CONTRACT AGREEMENT is made the day of 2021

BETWEEN

1. **Docklands Light Railway Limited**, having its registered number **02052677** and its registered office at **5 Endeavor Square, London, E20 1JN** (hereinafter called "**the Employer**") which expression shall include its successors in title and permitted assignees, and
2. **KONE PLC** a company incorporated in and in accordance with the laws of **ENGLAND AND WALES** having as its registered number **01372978** and its registered office at **Global House, Station Place, Fox Lane North, Chertsey KT16 9HW** (hereinafter called "**the Contractor**").

RECITALS

- (A) The *Employer* wishes to appoint the *Contractor* for the post-storage overhaul of 2No. escalators assets at Custom House DLR station and the mid life overhaul of 2No. escalator assets at London City Airport Escalators
- (B) The *Contractor* has submitted his tender in response to the *Employer's* invitation to tender. The *Employer* has examined the *Contractor's* said tender and subject to the provisions of this contract is willing to engage the *Contractor* to carry out the *works* in accordance with this contract.

OPERATIVE PROVISIONS

1. In this Contract Agreement, unless the context otherwise requires, words and expressions shall have the same meaning as set out in the *conditions of contract*.
2. The *conditions of contract* are the NEC Engineering and Construction Contract Option A: Priced Contract with Activity Schedule (Third edition June 2005 with amendments June 2006 and April 2013) together with Schedule 1 Amendments to Conditions of Contract and the Z Clauses.
3. This contract shall mean this document and the following documents which are hereby incorporated into and shall comprise this contract
 - 3.1 the *conditions of contract* (including, for the avoidance of doubt, the Amendments to Conditions of Contract, as set out in Schedule 1 to this document and Schedule 2 Insurance Table)
 - 3.2 the Contract Data Part One,
 - 3.3 the Contract Data Part Two,
 - 3.4 the Employer's Works Information,



- 3.5 the Site Information,
- 3.6 the Activity Schedule
- 4. The several documents forming this contract are to be taken as mutually explanatory of one another. In the event of any ambiguity they shall be construed in the order set out in Clause 3 of this Contract Agreement.
- 5. The *Contractor* provides the Works in accordance with this contract.
- 6. The *Employer* pays the *Contractor* for complying with his obligations to provide the Works the amount due in accordance with this contract.

Executed and delivered for and on behalf of **Docklands Light Railway Limited** (the *Employer*) on the date above by:

_____ (signed)
_____ Maitur Choudhury _____ (Delegated Procurement Authority)

Signed and delivered for and on behalf of **KONE PLC** (the *Contractor*) on the date above by:

_____ (signed)
_____ Brenda Msi _____ (Company Secretary)
_____ (signed)
_____ Andrew Miles _____ (Company Director)



**Custom House and London City Airport Escalator Repair
Works**

2018-055-01

Contract Data – Part One



This amended contract is based on the NEC Engineering and Construction Contract, the copyright in which standard form belongs to the Institution of Civil Engineers.

CONTRACT DATA

Part one - Data provided by the *Employer*

**Statements given in all
contracts**

1. General

- The *conditions of contract* are the NEC3 Engineering and Construction Contract (Third edition June 2005 with amendments June 2006 and April 2013) core clauses together with the clauses for main Option A, dispute resolution Option W2, secondary Options X5, X7, X15, X16, X18, Y(UK)2, Y(UK)3 and Amendments to Conditions of Contract in Schedule 1

- The *works* are:

The post-storage overhaul of 2No escalators assets at Custom House DLR station and the mid-life overhaul of 2No escalator assets at London City Airport DLR station

- The *Employer* is:

Name: Docklands Light Railway Limited

Address: Castor Lane, Poplar, London, E14 0BL

- The *Project Manager* is:

Name: Tim Vardy

Address: Docklands Light Railway, Castor Lane, Poplar, London, E14 0BL

- The *Supervisor* is

Name: As notified to the *Contractor* by the *Project Manager* from time to time

Address: Docklands Light Railway, Post Box 154, Poplar, London, E14 0BL

- The *Adjudicator* is: as appointed by the President or Vice



President of the Royal Institution of
 Chartered Surveyors.

- | | |
|----------------------------|---|
| 2. Works Information | <ul style="list-style-type: none"> • The Works Information is in the document entitled “Custom House and London City Airport Escalator Repair Works – 2018-055-01 – Works Information” appended hereto and includes all documents referenced to therein. |
| 3. Site Information | <ul style="list-style-type: none"> • The Site Information is in the document entitled “Custom House and London City Airport Escalator Repair Works – 2018-055-01 - Site Information” appended hereto and includes all documents referenced to therein. • The <i>boundaries of the site</i> are: The boundaries of the Working Areas as described and / or as shown in the Site Information |
| 4. Language | <ul style="list-style-type: none"> • The <i>language of this contract</i> is: English |
| 5. Period for Reply | <ul style="list-style-type: none"> • The <i>period for reply</i> is: 14 days |
| 6. Tribunal | <ul style="list-style-type: none"> • The <i>tribunal</i> is The courts of England and Wales |
| 7. Time | <ul style="list-style-type: none"> • The <i>starting date</i> is 22nd July 2021 • The <i>completion date</i> for the whole of the <i>works</i> is 31st January 2022 |
| 8. X5 Sectional Completion | <ul style="list-style-type: none"> • The completion date for Section 1 works is 6th December 2021 • The completion date for Section 2 works is 10th January 2022 |
| 9. Programme | <ul style="list-style-type: none"> • If no programme is identified in part two of the Contract Data the Contractor is to submit a first programme for acceptance within 2 weeks of the Contract Date. • The Contractor submits revised programmes at intervals no longer than 4 weeks. • The <i>Contractor’s</i> programme complies with all dates and timescales |



set out in the Contract Data.

- | | |
|---------------------------------|--|
| 10. Testing and Defects | <ul style="list-style-type: none"> • The <i>defects date</i> is 52 weeks after Completion of the whole of the <i>works</i>. • The <i>defect correction period</i> is 48 hours. |
| 11. Payment | <ul style="list-style-type: none"> • The <i>currency of this contract</i> is GBP Sterling • The <i>assessment interval</i> is every 4 weeks (not more than five) accounting period of the <i>Employer</i>, such periods to be advised to the <i>Contractor</i> annually. • Payment is made in accordance with the Payment Schedule in the Activity Schedule • The <i>interest rate</i> is 3% per annum above the base lending rate of the Bank of England • The <i>Contractor</i> submits invoices on the basis of certification and such invoices contain the Contractor's Vendor Number and the contract Purchase Order Number. The <i>Contractor</i> also submits a copy of the relevant Payment Certificate signed by the <i>Project Manager</i> with his invoice. • The period for payment is Within 30 days of invoice date
 <hr style="border-top: 1px dotted black;"/> |
| 12. Additional Employer's Risks | <ul style="list-style-type: none"> • There are no additional <i>Employer's</i> risks: |
| 13. Delay Damages | <ul style="list-style-type: none"> • Delay damages for each <i>section</i> of the <i>works</i> are £600 per day or part there of as sole and exclusive remedy for delay • X7 Delay damages for Completion of the whole of the <i>works</i> are:
 <div style="text-align: center; margin-top: 5px;"> £0 per day or part thereof </div> |
| 14. Possession Overrun | <ul style="list-style-type: none"> • Not Used |
| 15. X4 Parent Company | <ul style="list-style-type: none"> • Not Used. |



Guarantee

16. X15 Limitation of Contractor's Design liability
- Option X15 is applicable
17. X16 Retention
- Retention is applied to all interim payments of the Amount Due and will be held at **0%** until Completion when the amount will be reduced to **0%** until the end of the *defects date*. The Contractor to provide a LEIA Bond Guarantee.
18. X18 Limitation of Liability
- The *Contractor's* liabilities are limited as follows:

For any one event, the *Contractor's* liability to the *Employer* for loss of or damage to the *Employer's* property is limited to 300% of the final total of the Prices.

The *Contractor's* liability for Defects due to his design which are not listed on the Defects Certificate is limited to 300% of the final total of the Prices.

The *Contractor's* total liability to the *Employer* for all matters arising under or in connection with this contract, other than excluded matters, is limited to 300% of the final total of the Prices.

The end of liability date is 12 years after the Completion of the whole of the *works*
19. Insurance
- The *Employer* provides the insurances as stated in Schedule 2 hereto to be provided by the *Employer*. The insurances being provided by the *Employer* are subject to the following deductibles which the Contractor is liable for:

Construction All Risks

£250,000.00 each occurrence in respect of loss or damage caused to the works by defects in design, plan, specification, materials or workmanship.

£25,000.00 each occurrence in respect of loss or damage caused by storm tempest, water damage, subsidence or collapse.



£25,000.00 each occurrence in respect of loss or damage caused by defect in design, plan, specification, materials or workmanship.

£5,000.00 each occurrence all other losses

Public Liability

£10,000.00 each and every occurrence

- 20. Y(UK)2 Housing Grants Construction and Regeneration Act 1999
 - The period for payment is 28 days after the date when payment becomes due in accordance with clause 51.1A of the conditions of contract.

- 21. Y(UK)3 The Contracts (Rights of Third Parties) Act 1996
 - For the purpose of secondary Option Y(UK)3 the terms and persons or organisations are:
 - All terms of this contract** **TfL Group**
 - All terms of this contract** **DfT**

 - *TfL* is Transport for London of 5 Endeavour Square, London E20 1YN.
 - *DfT* is Department for Transport of Great Minster House, 33 Horseferry Rd, Westminster, London SW1P 4DR.

- 22. Additional Conditions
 - The *additional conditions of contract* are those set out in Schedule 1 to the Contract Agreement and Z clauses.

Part two - Data provided by the Contractor

Statements given in all contracts

1. General

- The Contractor is

Name KONE PLC

Address Global House, Station Place, Fox Ln N, Chertsey
KT16 9HW

2. Fee Percentages

- The direct fee percentage is 15 %
- The subcontracted fee percentage is 15 %

3. Working Areas

- Custom House and London City Airport DLR Stations

4. Key People

- The key people are

(1) Name Elliot Groom

Job Escalator Modernisation Sales Manager

Responsibilities

(2) Name John Eccles

Job Senior Project Manager

Responsibilities

(3) Name Rupert Baker

Job Health & Safety Specialist

Responsibilities

5. Risk Register
- The following matters will be included in the Risk Register: Not Used
-

6. Contractor's Design
- The *Works* Information for the *Contractor's* design is in the Works Information titled "*Contractor's Works Information*"
-

7. Activity Schedule / Price
- The *activity schedule* is in the Activity Schedule and also contains the contract Payment Profile and payment Schedule.

8. Prices
- The tendered total of the Prices is: £307,015

**Data for the Shorter
Schedule of Cost
Components**

The percentage for people overheads is 15%

The published list of Equipment is the last edition of the list published by:

The percentage for adjustment for Equipment in the published list is (state plus or minus)

The rates for other Equipment are N/A

Equipment	size or capacity	rate
-----------	------------------	------

The hourly rates for Defined Cost of design outside the Working Areas are

category of employee	hourly rate
<u>Project Director</u>	<u>£ Included</u>
<u>Lead Engineer</u>	<u>£ 71.58 per hour</u>
<u>Project Manager</u>	<u>£ Included</u>
<u>Senior Engineer</u>	<u>£ Included</u>
<u>Managers / Supervisors</u>	<u>£ Included</u>
<u>Installation Technician</u>	<u>£ 71.58 per hour</u>
<u>Design Manager</u>	<u>£ Included</u>

The percentage for design overheads is N/A

The uplift to labour rates are as follows:

- Working Day Overtime: %
- Saturday / Sunday working: %



Engineering and Construction Contract

This contract should be used for the appointment of a contractor for engineering and construction work, including any level of design responsibility

Option A: Priced contract with activity schedule

An NEC document

June 2005

OGC endorsement of NEC3

OGC advises public sector procurers that the form of contract used has to be selected according to the objectives of the project, aiming to satisfy the *Achieving Excellence in Construction* (AEC) principles.

This edition of the NEC (NEC3) complies fully with the AEC principles. OGC recommends the use of NEC3 by public sector construction procurers on their construction projects.

NEC is a division of Thomas Telford Ltd, which is a wholly owned subsidiary of the Institution of Civil Engineers (ICE), the owner and developer of the NEC.

The NEC is a family of standard contracts, each of which has these characteristics:

- Its use stimulates good management of the relationship between the two parties to the contract and, hence, of the work included in the contract.
- It can be used in a wide variety of commercial situations, for a wide variety of types of work and in any location.
- It is a clear and simple document – using language and a structure which are straightforward and easily understood.

NEC3 Engineering and Construction Contract is one of the NEC family and is consistent with all other NEC3 documents. Also available are the Engineering and Construction Contract Guidance Notes, Flow Charts and Options A, B, C, D, E and F.

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SCHEDULE OF OPTIONS

	One of the following dispute resolution Options must be selected to complete the chosen main Option.
Option W1	Dispute resolution procedure (used unless the United Kingdom Housing Grants, Construction and Regeneration Act 1996 applies).
Option W2	Dispute resolution procedure (used in the United Kingdom when the Housing Grants, Construction and Regeneration Act 1996 applies).
	The following secondary Options should then be considered. It is not necessary to use any of them. Any combination other than those stated may be used.
Option X1	Price adjustment for inflation
Option X2	Changes in the law
Option X3	Multiple currencies
Option X4	Parent company guarantee
Option X5	Sectional Completion
Option X6	Bonus for early Completion
Option X7	Delay damages
Option X12	Partnering
Option X13	Performance bond
Option X14	Advanced payment to the <i>Contractor</i>
Option X15	Limitation of the <i>Contractor's</i> liability for his design to reasonable skill and care
Option X16	Retention
Option X17	Low performance damages
Option X18	Limitation of liability
Option X20	Key Performance Indicators (not used with Option X12)
	The following Options dealing with national legislation should be included if required.
Option Y(UK)2	The Housing Grants, Construction and Regeneration Act 1996
Option Y(UK)3	The Contracts (Rights of Third Parties) Act 1999
Option Z	<i>Additional conditions of contract</i>
Note	Options X8 to X11, X19 and Y(UK)1 are not used.

CORE CLAUSES

1 General

Actions 10

10.1 The *Employer*, the *Contractor*, the *Project Manager* and the *Supervisor* shall act as stated in this contract and in a spirit of mutual trust and co-operation.

Identified and defined terms 11

11.1 In these conditions of contract, terms identified in the Contract Data are in italics and defined terms have capital initials.

11.2 (1) The Accepted Programme is the programme identified in the Contract Data or is the latest programme accepted by the *Project Manager*. The latest programme accepted by the *Project Manager* supersedes previous Accepted Programmes.

(2) Completion is when the *Contractor* has

- done all the work which the Works Information states he is to do by the Completion Date and
- corrected notified Defects which would have prevented the *Employer* from using the *works* and Others from doing their work.

If the work which the *Contractor* is to do by the Completion Date is not stated in the Works Information, Completion is when the *Contractor* has done all the work necessary for the *Employer* to use the *works* and for Others to do their work.

(3) The Completion Date is the *completion date* unless later changed in accordance with this contract.

(4) The Contract Date is the date when this contract came into existence.

(5) A Defect is

- a part of the *works* which is not in accordance with the Works Information or
- a part of the *works* designed by the *Contractor* which is not in accordance with the applicable law or the *Contractor's* design which the *Project Manager* has accepted.

(6) The Defects Certificate is either a list of Defects that the *Supervisor* has notified before the *defects date* which the *Contractor* has not corrected or, if there are no such Defects, a statement that there are none.

(7) Equipment is items provided by the *Contractor* and used by him to Provide the Works and which the Works Information does not require him to include in the *works*.

(8) The Fee is the sum of the amounts calculated by applying the *subcontracted fee percentage* to the Defined Cost of subcontracted work and the *direct fee percentage* to the Defined Cost of other work.

(9) A Key Date is the date by which work is to meet the Condition stated. The Key Date is the *key date* stated in the Contract Data and the Condition is the *defects date* stated in the Contract Data unless later changed in accordance with this contract.

(10) Others are people or organisations who are not the *Employer*, the *Project Manager*, the *Supervisor*, the *Adjudicator*, the *Contractor* or any employee, Subcontractor or supplier of the *Contractor*.

(11) The Parties are the *Employer* and the *Contractor*.

(12) Plant and Materials are items intended to be included in the *works*.

(13) To Provide the Works means to do the work necessary to complete the *works* in accordance with this contract and all incidental work, services and actions which this contract requires.

(14) The Risk Register is a register of the risks which are listed in the Contract Data and the risks which the *Project Manager* or the *Contractor* has notified as an early warning matter. It includes a description of the risk and a description of the actions which are to be taken to avoid or reduce the risk.

(15) The Site is the area within the *boundaries of the site* and the volumes above and below it which are affected by work included in this contract.

(16) Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in.

(17) A Subcontractor is a person or organisation who has a contract with the *Contractor* to

- construct or install part of the *works*,
- provide a service necessary to Provide the Works or
- supply Plant and Materials which the person or organisation has wholly or partly designed specifically for the *works*.

(18) The Working Areas are those parts of the *working areas* which are

- necessary for Providing the Works and
- used only for work in this contract

unless later changed in accordance with this contract.

(19) Works Information is information which either

- specifies and describes the *works* or
- states any constraints on how the *Contractor* Provides the Works

and is either

- in the documents which the Contract Data states it is in or
- in an instruction given in accordance with this contract.

(20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract.

(22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether work is subcontracted or not excluding the cost of preparing quotations for compensation events.

(27) The Price for Work Done to Date is the total of the Prices for

- each group of completed activities and
- each completed activity which is not in a group.

A completed activity is one which is without Defects which would either delay or be covered by immediately following work.

(30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

**Interpretation and
the law 12**

- 12.1 In this contract, except where the context shows otherwise, words in the singular also mean in the plural and the other way round and words in the masculine also mean in the feminine and neuter.
- 12.2 This contract is governed by the *law of the contract*.
- 12.3 No change to this contract, unless provided for by the *conditions of contract*, has effect unless it has been agreed, confirmed in writing and signed by the Parties.
- 12.4 This contract is the entire agreement between the Parties.

Communications 13

- 13.1 Each instruction, certificate, submission, proposal, record, acceptance, notification, reply and other communication which this contract requires is communicated in a form which can be read, copied and recorded. Writing is in the *language of this contract*.
- 13.2 A communication has effect when it is received at the last address notified by the recipient for receiving communications or, if none is notified, at the address of the recipient stated in the Contract Data.
- 13.3 If this contract requires the *Project Manager*, the *Supervisor* or the *Contractor* to reply to a communication, unless otherwise stated in this contract, he replies within the *period for reply*.
- 13.4 The *Project Manager* replies to a communication submitted or resubmitted to him by the *Contractor* for acceptance. If his reply is not acceptance, the *Project Manager* states his reasons and the *Contractor* resubmits the communication within the *period for reply* taking account of these reasons. A reason for withholding acceptance is that more information is needed in order to assess the *Contractor's* submission fully.
- 13.5 The *Project Manager* may extend the *period for reply* to a communication if the *Project Manager* and the *Contractor* agree to the extension before the reply is due. The *Project Manager* notifies the *Contractor* of the extension which has been agreed.
- 13.6 The *Project Manager* issues his certificates to the *Employer* and the *Contractor*. The *Supervisor* issues his certificates to the *Project Manager* and the *Contractor*.
- 13.7 A notification which this contract requires is communicated separately from other communications.
- 13.8 The *Project Manager* may withhold acceptance of a submission by the *Contractor*. Withholding acceptance for a reason stated in this contract is not a compensation event.

**The Project Manager
and the Supervisor 14**

- 14.1 The *Project Manager's* or the *Supervisor's* acceptance of a communication from the *Contractor* or of his work does not change the *Contractor's* responsibility to Provide the Works or his liability for his design.
- 14.2 The *Project Manager* and the *Supervisor*, after notifying the *Contractor*, may delegate any of their actions and may cancel any delegation. A reference to an action of the *Project Manager* or the *Supervisor* in this contract includes an action by his delegate.
- 14.3 The *Project Manager* may give an instruction to the *Contractor* which changes the Works Information or a Key Date.
- 14.4 The *Employer* may replace the *Project Manager* or the *Supervisor* after he has notified the *Contractor* of the name of the replacement.

Adding to the Working Areas 15

15.1 The *Contractor* may submit a proposal for adding an area to the Working Areas to the *Project Manager* for acceptance. A reason for not accepting is that the proposed area is either not necessary for Providing the Works or used for work not in this contract.

Early warning 16

16.1 The *Contractor* and the *Project Manager* give an early warning by notifying the other as soon as either becomes aware of any matter which could

- increase the total of the Prices,
- delay Completion,
- delay meeting a Key Date or
- impair the performance of the *works* in use.

The *Contractor* may give an early warning by notifying the *Project Manager* of any other matter which could increase his total cost. The *Project Manager* enters early warning matters in the Risk Register. Early warning of a matter for which a compensation event has previously been notified is not required.

16.2 Either the *Project Manager* or the *Contractor* may instruct the other to attend a risk reduction meeting. Each may instruct other people to attend if the other agrees.

16.3 At a risk reduction meeting, those who attend co-operate in

- making and considering proposals for how the effect of the registered risks can be avoided or reduced,
- seeking solutions that will bring advantage to all those who will be affected,
- deciding on the actions which will be taken and who, in accordance with this contract, will take them and
- deciding which risks have now been avoided or have passed and can be removed from the Risk Register.

16.4 The *Project Manager* revises the Risk Register to record the decisions made at each risk reduction meeting and issues the revised Risk Register to the *Contractor*. If a decision needs a change to the Works Information, the *Project Manager* instructs the change at the same time as he issues the revised Risk Register.

Ambiguities and inconsistencies 17

17.1 The *Project Manager* or the *Contractor* notifies the other as soon as either becomes aware of an ambiguity or inconsistency in or between the documents which are part of this contract. The *Project Manager* gives an instruction resolving the ambiguity or inconsistency.

Illegal and impossible requirements 18

18.1 The *Contractor* notifies the *Project Manager* as soon as he considers that the Works Information requires him to do anything which is illegal or impossible. If the *Project Manager* agrees, he gives an instruction to change the Works Information appropriately.

Prevention 19

19.1 If an event occurs which

- stops the *Contractor* completing the *works* or
- stops the *Contractor* completing the *works* by the date shown on the Accepted Programme,

and which

- neither Party could prevent and
- an experienced contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable for him to have allowed for it,

the *Project Manager* gives an instruction to the *Contractor* stating how he is to deal with the event.

2 The Contractor's main responsibilities

Providing the Works 20

20.1 The *Contractor* Provides the Works in accordance with the Works Information.

The Contractor's design 21

21.1 The *Contractor* designs the parts of the *works* which the Works Information states he is to design.

21.2 The *Contractor* submits the particulars of his design as the Works Information requires to the *Project Manager* for acceptance. A reason for not accepting the *Contractor's* design is that it does not comply with either the Works Information or the applicable law.

The *Contractor* does not proceed with the relevant work until the *Project Manager* has accepted his design.

21.3 The *Contractor* may submit his design for acceptance in parts if the design of each part can be assessed fully.

Using the Contractor's design 22

22.1 The *Employer* may use and copy the *Contractor's* design for any purpose connected with construction, use, alteration or demolition of the *works* unless otherwise stated in the Works Information and for other purposes as stated in the Works Information.

Design of Equipment 23

23.1 The *Contractor* submits particulars of the design of an item of Equipment to the *Project Manager* for acceptance if the *Project Manager* instructs him to. A reason for not accepting is that the design of the item will not allow the *Contractor* to Provide the Works in accordance with

- the Works Information,
- the *Contractor's* design which the *Project Manager* has accepted or
- the applicable law.

People 24

24.1 The *Contractor* either employs each key person named to do the job stated in the Contract Data or employs a replacement person who has been accepted by the *Project Manager*. The *Contractor* submits the name, relevant qualifications and experience of a proposed replacement person to the *Project Manager* for acceptance. A reason for not accepting the person is that his relevant qualifications and experience are not as good as those of the person who is to be replaced.

24.2 The *Project Manager* may, having stated his reasons, instruct the *Contractor* to remove an employee. The *Contractor* then arranges that, after one day, the employee has no further connection with the work included in this contract.

Working with the Employer and Others 25

25.1 The *Contractor* co-operates with Others in obtaining and providing information which they need in connection with the *works*. He co-operates with Others and shares the Working Areas with them as stated in the Works Information.

25.2 The *Employer* and the *Contractor* provide services and other things as stated in the Works Information. Any cost incurred by the *Employer* as a result of the *Contractor* not providing the services and other things which he is to provide is assessed by the *Project Manager* and paid by the *Contractor*.

25.3 If the *Project Manager* decides that the work does not meet the Condition stated for a Key Date by the date stated and, as a result, the *Employer* incurs additional cost either

- in carrying out work or
- by paying an additional amount to Others in carrying out work

on the same project, the additional cost which the *Employer* has paid or will incur is paid by the *Contractor*. The *Project Manager* assesses the additional cost within four weeks of the date when the Condition for the Key Date is met. The *Employer's* right to recover the additional cost is his only right in these circumstances.

Subcontracting 26

26.1 If the *Contractor* subcontracts work, he is responsible for Providing the Works as if he had not subcontracted. This contract applies as if a Subcontractor's employees and equipment were the *Contractor's*.

26.2 The *Contractor* submits the name of each proposed Subcontractor to the *Project Manager* for acceptance. A reason for not accepting the Subcontractor is that his appointment will not allow the *Contractor* to Provide the Works. The *Contractor* does not appoint a proposed Subcontractor until the *Project Manager* has accepted him.

26.3 The *Contractor* submits the proposed conditions of contract for each subcontract to the *Project Manager* for acceptance unless

- an NEC contract is proposed or
- the *Project Manager* has agreed that no submission is required.

The *Contractor* does not appoint a Subcontractor on the proposed subcontract conditions submitted until the *Project Manager* has accepted them. A reason for not accepting them is that

- they will not allow the *Contractor* to Provide the Works or
- they do not include a statement that the parties to the subcontract shall act in a spirit of mutual trust and co-operation.

Other responsibilities 27

27.1 The *Contractor* obtains approval of his design from Others where necessary.

27.2 The *Contractor* provides access to work being done and to Plant and Materials being stored for this contract for

- the *Project Manager*,
- the *Supervisor* and
- Others notified to him by the *Project Manager*.

27.3 The *Contractor* obeys an instruction which is in accordance with this contract and is given to him by the *Project Manager* or the *Supervisor*.

27.4 The *Contractor* acts in accordance with the health and safety requirements stated in the Works Information.

3 Time

Starting, Completion and Key Dates 30

- 30.1 The *Contractor* does not start work on the Site until the first *access date* and does the work so that Completion is on or before the Completion Date.
- 30.2 The *Project Manager* decides the date of Completion. The *Project Manager* certifies Completion within one week of Completion.
- 30.3 The *Contractor* does the work so that the Condition stated for each Key Date is met by the Key Date.

The programme 31

- 31.1 If a programme is not identified in the Contract Data, the *Contractor* submits a first programme to the *Project Manager* for acceptance within the period stated in the Contract Data.
- 31.2 The *Contractor* shows on each programme which he submits for acceptance
- the *starting date*, *access dates*, Key Dates and Completion Date,
 - planned Completion,
 - the order and timing of the operations which the *Contractor* plans to do in order to Provide the Works,
 - the order and timing of the work of the *Employer* and Others as last agreed with them by the *Contractor* or, if not so agreed, as stated in the Works Information,
 - the dates when the *Contractor* plans to meet each Condition stated for the Key Dates and to complete other work needed to allow the *Employer* and Others to do their work,
 - provisions for
 - float,
 - time risk allowances,
 - health and safety requirements and
 - the procedures set out in this contract,
 - the dates when, in order to Provide the Works in accordance with his programme, the *Contractor* will need
 - access to a part of the Site if later than its *access date*,
 - acceptances,
 - Plant and Materials and other things to be provided by the *Employer* and
 - information from Others,
 - for each operation, a statement of how the *Contractor* plans to do the work identifying the principal Equipment and other resources which he plans to use and
 - other information which the Works Information requires the *Contractor* to show on a programme submitted for acceptance.
- 31.3 Within two weeks of the *Contractor* submitting a programme to him for acceptance, the *Project Manager* either accepts the programme or notifies the *Contractor* of his reasons for not accepting it. A reason for not accepting a programme is that
- the *Contractor's* plans which it shows are not practicable,
 - it does not show the information which this contract requires,
 - it does not represent the *Contractor's* plans realistically or
 - it does not comply with the Works Information.

The programme 31

- 31.4 **The *Contractor* provides information which shows how each activity on the Activity Schedule relates to the operations on each programme which he submits for acceptance.**

Revising the programme 32

- 32.1 The *Contractor* shows on each revised programme
- the actual progress achieved on each operation and its effect upon the timing of the remaining work,
 - the effects of implemented compensation events,
 - how the *Contractor* plans to deal with any delays and to correct notified Defects and
 - any other changes which the *Contractor* proposes to make to the Accepted Programme.
- 32.2 The *Contractor* submits a revised programme to the *Project Manager* for acceptance
- within the *period for reply* after the *Project Manager* has instructed him to,
 - when the *Contractor* chooses to and, in any case,
 - at no longer interval than the interval stated in the Contract Data from the *starting date* until Completion of the whole of the *works*.

Access to and use of the Site 33

- 33.1 The *Employer* allows access to and use of each part of the Site to the *Contractor* which is necessary for the work included in this contract. Access and use is allowed on or before the later of its *access date* and the date for access shown on the Accepted Programme.

Instructions to stop or not to start work 34

- 34.1 The *Project Manager* may instruct the *Contractor* to stop or not to start any work and may later instruct him that he may re-start or start it.

Take over 35

- 35.1 The *Employer* need not take over the *works* before the Completion Date if it is stated in the Contract Data that he is not willing to do so. Otherwise the *Employer* takes over the *works* not later than two weeks after Completion.
- 35.2 The *Employer* may use any part of the *works* before Completion has been certified. If he does so, he takes over the part of the *works* when he begins to use it except if the use is
- for a reason stated in the Works Information or
 - to suit the *Contractor's* method of working.
- 35.3 The *Project Manager* certifies the date upon which the *Employer* takes over any part of the *works* and its extent within one week of the date.

Acceleration 36

- 36.1 The *Project Manager* may instruct the *Contractor* to submit a quotation for an acceleration to achieve Completion before the Completion Date. The *Project Manager* states changes to the Key Dates to be included in the quotation. A quotation for an acceleration comprises proposed changes to the Prices and a revised programme showing the earlier Completion Date and the changed Key Dates. The *Contractor* submits details of his assessment with each quotation.
- 36.2 The *Contractor* submits a quotation or gives his reasons for not doing so within the *period for reply*.
- 36.3 When the *Project Manager* accepts a quotation for an acceleration, he changes the Prices, the Completion Date and the Key Dates accordingly and accepts the revised programme.**

4 Testing and Defects

Tests and inspections 40

- 40.1 The subclauses in this clause only apply to tests and inspections required by the Works Information or the applicable law.
- 40.2 The *Contractor* and the *Employer* provide materials, facilities and samples for tests and inspections as stated in the Works Information.
- 40.3 The *Contractor* and the *Supervisor* each notifies the other of each of his tests and inspections before it starts and afterwards notifies the other of its results. The *Contractor* notifies the *Supervisor* in time for a test or inspection to be arranged and done before doing work which would obstruct the test or inspection. The *Supervisor* may watch any test done by the *Contractor*.
- 40.4 If a test or inspection shows that any work has a Defect, the *Contractor* corrects the Defect and the test or inspection is repeated.
- 40.5 The *Supervisor* does his tests and inspections without causing unnecessary delay to the work or to a payment which is conditional upon a test or inspection being successful. A payment which is conditional upon a *Supervisor's* test or inspection being successful becomes due at the later of the *defects date* and the end of the last *defect correction period* if
- the *Supervisor* has not done the test or inspection and
- the delay to the test or inspection is not the *Contractor's* fault.
- 40.6 The *Project Manager* assesses the cost incurred by the *Employer* in repeating a test or inspection after a Defect is found. The *Contractor* pays the amount assessed.

Testing and inspection before delivery 41

- 41.1 The *Contractor* does not bring to the Working Areas those Plant and Materials which the Works Information states are to be tested or inspected before delivery until the *Supervisor* has notified the *Contractor* that they have passed the test or inspection.

Searching for and notifying Defects 42

- 42.1 Until the *defects date*, the *Supervisor* may instruct the *Contractor* to search for a Defect. He gives his reason for the search with his instruction. Searching may include
- uncovering, dismantling, re-covering and re-erecting work,
 - providing facilities, materials and samples for tests and inspections done by the *Supervisor* and
 - doing tests and inspections which the Works Information does not require.
- 42.2 Until the *defects date*, the *Supervisor* notifies the *Contractor* of each Defect as soon as he finds it and the *Contractor* notifies the *Supervisor* of each Defect as soon as he finds it.

Correcting Defects 43

- 43.1 The *Contractor* corrects a Defect whether or not the *Supervisor* notifies him of it.
- 43.2 The *Contractor* corrects a notified Defect before the end of the *defect correction period*. The *defect correction period* begins at Completion for Defects notified before Completion and when the Defect is notified for other Defects.

43.3 The *Supervisor* issues the Defects Certificate at the later of the *defects date* and the end of the last *defect correction period*. The *Employer's* rights in respect of a Defect which the *Supervisor* has not found or notified are not affected by the issue of the Defects Certificate.

43.4 The *Project Manager* arranges for the *Employer* to allow the *Contractor* access to and use of a part of the *works* which he has taken over if they are needed for correcting a Defect. In this case the *defect correction period* begins when the necessary access and use have been provided.

Accepting Defects 44

44.1 The *Contractor* and the *Project Manager* may each propose to the other that the Works Information should be changed so that a Defect does not have to be corrected.

44.2 If the *Contractor* and the *Project Manager* are prepared to consider the change, the *Contractor* submits a quotation for reduced Prices or an earlier Completion Date or both to the *Project Manager* for acceptance. If the *Project Manager* accepts the quotation, he gives an instruction to change the Works Information, the Prices and the Completion Date accordingly.

Uncorrected Defects 45

45.1 If the *Contractor* is given access in order to correct a notified Defect but he has not corrected it within its *defect correction period*, the *Project Manager* assesses the cost to the *Employer* of having the Defect corrected by other people and the *Contractor* pays this amount. The Works Information is treated as having been changed to accept the Defect.

45.2 If the *Contractor* is not given access in order to correct a notified Defect before the *defects date*, the *Project Manager* assesses the cost to the *Contractor* of correcting the Defect and the *Contractor* pays this amount. The Works Information is treated as having been changed to accept the Defect.

5 Payment

Assessing the amount due 50

- 50.1 The *Project Manager* assesses the amount due at each assessment date. The first assessment date is decided by the *Project Manager* to suit the procedures of the Parties and is not later than the *assessment interval* after the *starting date*. Later assessment dates occur
- at the end of each *assessment interval* until four weeks after the *Supervisor* issues the Defects Certificate and
 - at Completion of the whole of the *works*.
- 50.2 The amount due is
- the Price for Work Done to Date,
 - plus other amounts to be paid to the *Contractor*,
 - less amounts to be paid by or retained from the *Contractor*.
- Any tax which the law requires the *Employer* to pay to the *Contractor* is included in the amount due.
- 50.3 If no programme is identified in the Contract Data, one quarter of the Price for Work Done to Date is retained in assessments of the amount due until the *Contractor* has submitted a first programme to the *Project Manager* for acceptance showing the information which this contract requires.
- 50.4 In assessing the amount due, the *Project Manager* considers any application for payment the *Contractor* has submitted on or before the assessment date. The *Project Manager* gives the *Contractor* details of how the amount due has been assessed.
- 50.5 The *Project Manager* corrects any wrongly assessed amount due in a later payment certificate.

Payment 51

- 51.1 The *Project Manager* certifies a payment within one week of each assessment date. The first payment is the amount due. Other payments are the change in the amount due since the last payment certificate. A payment is made by the *Contractor* to the *Employer* if the change reduces the amount due. Other payments are made by the *Employer* to the *Contractor*. Payments are in the *currency of this contract* unless otherwise stated in this contract.
- 51.2 Each certified payment is made within three weeks of the assessment date or, if a different period is stated in the Contract Data, within the period stated. If a certified payment is late, or if a payment is late because the *Project Manager* does not issue a certificate which he should issue, interest is paid on the late payment. Interest is assessed from the date by which the late payment should have been made until the date when the late payment is made, and is included in the first assessment after the late payment is made.
- 51.3 If an amount due is corrected in a later certificate either
- by the *Project Manager* in relation to a mistake or a compensation event or
 - following a decision of the *Adjudicator* or the *tribunal*,
- interest on the correcting amount is paid. Interest is assessed from the date when the incorrect amount was certified until the date when the correcting amount is certified and is included in the assessment which includes the correcting amount.
- 51.4 Interest is calculated on a daily basis at the *interest rate* and is compounded annually.

Defined Cost 52

52.1 All the *Contractor's* costs which are not included in the Defined Cost are treated as included in the Fee. Defined Cost includes only amounts calculated using rates and percentages stated in the Contract Data and other amounts at open market or competitively tendered prices with deductions for all discounts, rebates and taxes which can be recovered.

The Activity Schedule 54

54.1 Information in the Activity Schedule is not Works Information or Site Information.

54.2 If the *Contractor* changes a planned method of working at his discretion so that the activities on the Activity Schedule do not relate to the operations on the Accepted Programme, he submits a revision of the Activity Schedule to the *Project Manager* for acceptance.

54.3 A reason for not accepting a revision of the Activity Schedule is that

- it does not comply with the Accepted Programme,
- any changed Prices are not reasonably distributed between the activities or
- the total of the Prices is changed.

6 Compensation events

Compensation events 60

60.1 The following are compensation events.

(1) The *Project Manager* gives an instruction changing the Works Information except

- a change made in order to accept a Defect or
- a change to the Works Information provided by the *Contractor* for his design which is made either at his request or to comply with other Works Information provided by the *Employer*.

(2) The *Employer* does not allow access to and use of a part of the Site by the later of its *access date* and the date shown on the Accepted Programme.

(3) The *Employer* does not provide something which he is to provide by the date for providing it shown on the Accepted Programme.

(4) The *Project Manager* gives an instruction to stop or not to start any work or to change a Key Date.

(5) The *Employer* or Others

- do not work within the times shown on the Accepted Programme,
- do not work within the conditions stated in the Works Information or
- carry out work on the Site that is not stated in the Works Information.

(6) The *Project Manager* or the *Supervisor* does not reply to a communication from the *Contractor* within the period required by this contract.

(7) The *Project Manager* gives an instruction for dealing with an object of value or of historical or other interest found within the Site.

(8) The *Project Manager* or the *Supervisor* changes a decision which he has previously communicated to the *Contractor*.

(9) The *Project Manager* withholds an acceptance (other than acceptance of a quotation for acceleration or for not correcting a Defect) for a reason not stated in this contract.

(10) The *Supervisor* instructs the *Contractor* to search for a Defect and no Defect is found unless the search is needed only because the *Contractor* gave insufficient notice of doing work obstructing a required test or inspection.

(11) A test or inspection done by the *Supervisor* causes unnecessary delay.

(12) The *Contractor* encounters physical conditions which

- are within the Site,
- are not weather conditions and
- an experienced contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable for him to have allowed for them.

Only the difference between the physical conditions encountered and those for which it would have been reasonable to have allowed is taken into account in assessing a compensation event.

(13) A *weather measurement* is recorded

- within a calendar month,
- before the Completion Date for the whole of the *works* and
- at the place stated in the Contract Data

the value of which, by comparison with the *weather data*, is shown to occur on average less frequently than once in ten years.

Only the difference between the *weather measurement* and the weather which the *weather data* show to occur on average less frequently than once in ten years is taken into account in assessing a compensation event.

(14) An event which is an *Employer's* risk stated in this contract.

(15) The *Project Manager* certifies take over of a part of the *works* before both Completion and the Completion Date.

(16) The *Employer* does not provide materials, facilities and samples for tests and inspections as stated in the Works Information.

(17) The *Project Manager* notifies a correction to an assumption which he has stated about a compensation event.

(18) A breach of contract by the *Employer* which is not one of the other compensation events in this contract.

(19) An event which

- stops the *Contractor* completing the *works* or
- stops the *Contractor* completing the *works* by the date shown on the Accepted Programme,

and which

- neither Party could prevent,
- an experienced contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable for him to have allowed for it and
- is not one of the other compensation events stated in this contract.

60.2 In judging the physical conditions for the purpose of assessing a compensation event, the *Contractor* is assumed to have taken into account

- the Site Information,
- publicly available information referred to in the Site Information,
- information obtainable from a visual inspection of the Site and
- other information which an experienced contractor could reasonably be expected to have or to obtain.

60.3 If there is an ambiguity or inconsistency within the Site Information (including the information referred to in it), the *Contractor* is assumed to have taken into account the physical conditions more favourable to doing the work.

**Notifying
compensation events 61**

61.1 For compensation events which arise from the *Project Manager* or the *Supervisor* giving an instruction or changing an earlier decision, the *Project Manager* notifies the *Contractor* of the compensation event at the time of giving the instruction or changing the earlier decision. He also instructs the *Contractor* to submit quotations, unless the event arises from a fault of the *Contractor* or quotations have already been submitted. The *Contractor* puts the instruction or changed decision into effect.

61.2 The *Project Manager* may instruct the *Contractor* to submit quotations for a proposed instruction or a proposed changed decision. The *Contractor* does not put a proposed instruction or a proposed changed decision into effect.

61.3 The *Contractor* notifies the *Project Manager* of an event which has happened or which he expects to happen as a compensation event if

- the *Contractor* believes that the event is a compensation event and
- the *Project Manager* has not notified the event to the *Contractor*.

If the *Contractor* does not notify a compensation event within eight weeks of becoming aware of the event, he is not entitled to a change in the Prices, the Completion Date or a Key Date unless the *Project Manager* should have notified the event to the *Contractor* but did not.

- 61.4 If the *Project Manager* decides that an event notified by the *Contractor*
- arises from a fault of the *Contractor*,
 - has not happened and is not expected to happen,
 - has no effect upon Defined Cost, Completion or meeting a Key Date or
 - is not one of the compensation events stated in this contract

he notifies the *Contractor* of his decision that the Prices, the Completion Date and the Key Dates are not to be changed.

If the *Project Manager* decides otherwise, he notifies the *Contractor* accordingly and instructs him to submit quotations.

If the *Project Manager* does not notify his decision to the *Contractor* within either

- one week of the *Contractor's* notification or
- a longer period to which the *Contractor* has agreed,

the *Contractor* may notify the *Project Manager* to this effect. A failure by the *Project Manager* to reply within two weeks of this notification is treated as acceptance by the *Project Manager* that the event is a compensation event and an instruction to submit quotations.

- 61.5 If the *Project Manager* decides that the *Contractor* did not give an early warning of the event which an experienced contractor could have given, he notifies this decision to the *Contractor* when he instructs him to submit quotations.

- 61.6 If the *Project Manager* decides that the effects of a compensation event are too uncertain to be forecast reasonably, he states assumptions about the event in his instruction to the *Contractor* to submit quotations. Assessment of the event is based on these assumptions. If any of them is later found to have been wrong, the *Project Manager* notifies a correction.

- 61.7 A compensation event is not notified after the *defects date*.

Quotations for compensation events 62

- 62.1 After discussing with the *Contractor* different ways of dealing with the compensation event which are practicable, the *Project Manager* may instruct the *Contractor* to submit alternative quotations. The *Contractor* submits the required quotations to the *Project Manager* and may submit quotations for other methods of dealing with the compensation event which he considers practicable.

- 62.2 Quotations for compensation events comprise proposed changes to the Prices and any delay to the Completion Date and Key Dates assessed by the *Contractor*. The *Contractor* submits details of his assessment with each quotation. If the programme for remaining work is altered by the compensation event, the *Contractor* includes the alterations to the Accepted Programme in his quotation.

- 62.3 The *Contractor* submits quotations within three weeks of being instructed to do so by the *Project Manager*. The *Project Manager* replies within two weeks of the submission. His reply is

- an instruction to submit a revised quotation,
- an acceptance of a quotation,
- a notification that a proposed instruction will not be given or a proposed changed decision will not be made or
- a notification that he will be making his own assessment.

- 62.4 The *Project Manager* instructs the *Contractor* to submit a revised quotation only after explaining his reasons for doing so to the *Contractor*. The *Contractor* submits the revised quotation within three weeks of being instructed to do so.

- 62.5 The *Project Manager* extends the time allowed for
- the *Contractor* to submit quotations for a compensation event and
 - the *Project Manager* to reply to a quotation

if the *Project Manager* and the *Contractor* agree to the extension before the submission or reply is due. The *Project Manager* notifies the extension that has been agreed to the *Contractor*.

- 62.6 If the *Project Manager* does not reply to a quotation within the time allowed, the *Contractor* may notify the *Project Manager* to this effect. If the *Contractor* submitted more than one quotation for the compensation event, he states in his notification which quotation he proposes is to be accepted. If the *Project Manager* does not reply to the notification within two weeks, and unless the quotation is for a proposed instruction or a proposed changed decision, the *Contractor's* notification is treated as acceptance of the quotation by the *Project Manager*.

**Assessing 63
compensation events**

- 63.1 The changes to the Prices are assessed as the effect of the compensation event upon
- the actual Defined Cost of the work already done,
 - the forecast Defined Cost of the work not yet done and
 - the resulting Fee.

The date when the *Project Manager* instructed or should have instructed the *Contractor* to submit quotations divides the work already done from the work not yet done.

- 63.2 If the effect of a compensation event is to reduce the total Defined Cost, the Prices are not reduced except as stated in this contract.
- 63.3 A delay to the Completion Date is assessed as the length of time that, due to the compensation event, planned Completion is later than planned Completion as shown on the Accepted Programme. A delay to a Key Date is assessed as the length of time that, due to the compensation event, the planned date when the Condition stated for a Key Date will be met is later than the date shown on the Accepted Programme.
- 63.4 The rights of the *Employer* and the *Contractor* to changes to the Prices, the Completion Date and the Key Dates are their only rights in respect of a compensation event.
- 63.5 If the *Project Manager* has notified the *Contractor* of his decision that the *Contractor* did not give an early warning of a compensation event which an experienced contractor could have given, the event is assessed as if the *Contractor* had given early warning.
- 63.6 Assessment of the effect of a compensation event includes risk allowances for cost and time for matters which have a significant chance of occurring and are at the *Contractor's* risk under this contract.
- 63.7 Assessments are based upon the assumptions that the *Contractor* reacts competently and promptly to the compensation event, that any Defined Cost and time due to the event are reasonably incurred and that the Accepted Programme can be changed.
- 63.8 A compensation event which is an instruction to change the Works Information in order to resolve an ambiguity or inconsistency is assessed as if the Prices, the Completion Date and the Key Dates were for the interpretation most favourable to the Party which did not provide the Works Information.
- 63.9 If a change to the Works Information makes the description of the Condition for a Key Date incorrect, the *Project Manager* corrects the description. This correction is taken into account in assessing the compensation event for the change to the Works Information.

63.10 If the effect of a compensation event is to reduce the total Defined Cost and the event is

- a change to the Works Information or
- a correction of an assumption stated by the *Project Manager* for assessing an earlier compensation event,

the Prices are reduced.

63.12 Assessments for changed Prices for compensation events are in the form of changes to the Activity Schedule.

63.14 If the *Project Manager* and the *Contractor* agree, rates and lump sums may be used to assess a compensation event instead of Defined Cost.

**The *Project Manager's*
assessments** **64**

64.1 The *Project Manager* assesses a compensation event

- if the *Contractor* has not submitted a quotation and details of his assessment within the time allowed,
- if the *Project Manager* decides that the *Contractor* has not assessed the compensation event correctly in a quotation and he does not instruct the *Contractor* to submit a revised quotation,
- if, when the *Contractor* submits quotations for a compensation event, he has not submitted a programme or alterations to a programme which this contract requires him to submit or
- if, when the *Contractor* submits quotations for a compensation event, the *Project Manager* has not accepted the *Contractor's* latest programme for one of the reasons stated in this contract.

64.2 The *Project Manager* assesses a compensation event using his own assessment of the programme for the remaining work if

- there is no Accepted Programme or
- the *Contractor* has not submitted a programme or alterations to a programme for acceptance as required by this contract.

64.3 The *Project Manager* notifies the *Contractor* of his assessment of a compensation event and gives him details of it within the period allowed for the *Contractor's* submission of his quotation for the same event. This period starts when the need for the *Project Manager's* assessment becomes apparent.

64.4 If the *Project Manager* does not assess a compensation event within the time allowed, the *Contractor* may notify the *Project Manager* to this effect. If the *Contractor* submitted more than one quotation for the compensation event, he states in his notification which quotation he proposes is to be accepted. If the *Project Manager* does not reply within two weeks of this notification the notification is treated as acceptance of the *Contractor's* quotation by the *Project Manager*.

**Implementing
compensation events** **65**

65.1 A compensation event is implemented when

- the *Project Manager* notifies his acceptance of the *Contractor's* quotation,
- the *Project Manager* notifies the *Contractor* of his own assessment or
- a *Contractor's* quotation is treated as having been accepted by the *Project Manager*.

65.2 The assessment of a compensation event is not revised if a forecast upon which it is based is shown by later recorded information to have been wrong.

65.4 The changes to the Prices, the Completion Date and the Key Dates are included in the notification implementing a compensation event.

7 Title

The Employer's title to Plant and Materials	70	
	70.1	Whatever title the <i>Contractor</i> has to Plant and Materials which is outside the Working Areas passes to the <i>Employer</i> if the <i>Supervisor</i> has marked it as for this contract.
	70.2	Whatever title the <i>Contractor</i> has to Plant and Materials passes to the <i>Employer</i> if it has been brought within the Working Areas. The title to Plant and Materials passes back to the <i>Contractor</i> if it is removed from the Working Areas with the <i>Project Manager's</i> permission.
Marking Equipment, Plant and Materials outside the Working Areas	71	
	71.1	The <i>Supervisor</i> marks Equipment, Plant and Materials which are outside the Working Areas if <ul style="list-style-type: none">• this contract identifies them for payment and• the <i>Contractor</i> has prepared them for marking as the Works Information requires.
Removing Equipment	72	
	72.1	The <i>Contractor</i> removes Equipment from the Site when it is no longer needed unless the <i>Project Manager</i> allows it to be left in the <i>works</i> .
Objects and materials within the Site	73	
	73.1	The <i>Contractor</i> has no title to an object of value or of historical or other interest within the Site. The <i>Contractor</i> notifies the <i>Project Manager</i> when such an object is found and the <i>Project Manager</i> instructs the <i>Contractor</i> how to deal with it. The <i>Contractor</i> does not move the object without instructions.
	73.2	The <i>Contractor</i> has title to materials from excavation and demolition only as stated in the Works Information.

8 Risks and insurance

Employer's risks 80

80.1 The following are *Employer's* risks.

- Claims, proceedings, compensation and costs payable which are due to
 - use or occupation of the Site by the *works* or for the purpose of the *works* which is the unavoidable result of the *works*,
 - negligence, breach of statutory duty or interference with any legal right by the *Employer* or by any person employed by or contracted to him except the *Contractor* or
 - a fault of the *Employer* or a fault in his design.
- Loss of or damage to Plant and Materials supplied to the *Contractor* by the *Employer*, or by Others on the *Employer's* behalf, until the *Contractor* has received and accepted them.
- Loss of or damage to the *works*, Plant and Materials due to
 - war, civil war, rebellion, revolution, insurrection, military or usurped power,
 - strikes, riots and civil commotion not confined to the *Contractor's* employees or
 - radioactive contamination.
- Loss of or wear or damage to the parts of the *works* taken over by the *Employer*, except loss, wear or damage occurring before the issue of the Defects Certificate which is due to
 - a Defect which existed at take over,
 - an event occurring before take over which was not itself an *Employer's* risk or
 - the activities of the *Contractor* on the Site after take over.
- Loss of or wear or damage to the *works* and any Equipment, Plant and Materials retained on the Site by the *Employer* after a termination, except loss, wear or damage due to the activities of the *Contractor* on the Site after the termination.
- Additional *Employer's* risks stated in the Contract Data.

The Contractor's risks 81

81.1 From the *starting date* until the Defects Certificate has been issued, the risks which are not carried by the *Employer* are carried by the *Contractor*.

Repairs 82

82.1 Until the Defects Certificate has been issued and unless otherwise instructed by the *Project Manager*, the *Contractor* promptly replaces loss of and repairs damage to the *works*, Plant and Materials.

Indemnity 83

83.1 Each Party indemnifies the other against claims, proceedings, compensation and costs due to an event which is at his risk.

83.2 The liability of each Party to indemnify the other is reduced if events at the other Party's risk contributed to the claims, proceedings, compensation and costs. The reduction is in proportion to the extent that events which were at the other Party's risk contributed, taking into account each Party's responsibilities under this contract.

Insurance cover 84

- 84.1 The *Contractor* provides the insurances stated in the Insurance Table except any insurance which the *Employer* is to provide as stated in the Contract Data. The *Contractor* provides additional insurances as stated in the Contract Data.
- 84.2 The insurances are in the joint names of the Parties and provide cover for events which are at the *Contractor's* risk from the *starting date* until the Defects Certificate or a termination certificate has been issued.

INSURANCE TABLE

Insurance against	Minimum amount of cover or minimum limit of indemnity
Loss of or damage to the <i>works</i> , Plant and Materials	The replacement cost, including the amount stated in the Contract Data for the replacement of any Plant and Materials provided by the <i>Employer</i>
Loss of or damage to Equipment	The replacement cost
Liability for loss of or damage to property (except the <i>works</i> , Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract	The amount stated in the Contract Data for any one event with cross liability so that the insurance applies to the Parties separately
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract	The greater of the amount required by the applicable law and the amount stated in the Contract Data for any one event

Insurance policies 85

- 85.1 Before the *starting date* and on each renewal of the insurance policy until the *defects date*, the *Contractor* submits to the *Project Manager* for acceptance certificates which state that the insurance required by this contract is in force. The certificates are signed by the *Contractor's* insurer or insurance broker. A reason for not accepting the certificates is that they do not comply with this contract.
- 85.2 Insurance policies include a waiver by the insurers of their subrogation rights against directors and other employees of every insured except where there is fraud.
- 85.3 The Parties comply with the terms and conditions of the insurance policies.
- 85.4 Any amount not recovered from an insurer is borne by the *Employer* for events which are at his risk and by the *Contractor* for events which are at his risk.

If the *Contractor* does not insure 86

- 86.1 The *Employer* may insure a risk which this contract requires the *Contractor* to insure if the *Contractor* does not submit a required certificate. The cost of this insurance to the *Employer* is paid by the *Contractor*.

Insurance by the *Employer* 87

- 87.1 The *Project Manager* submits policies and certificates for insurances provided by the *Employer* to the *Contractor* for acceptance before the *starting date* and afterwards as the *Contractor* instructs. The *Contractor* accepts the policies and certificates if they comply with this contract.

- 87.2 The *Contractor's* acceptance of an insurance policy or certificate provided by the *Employer* does not change the responsibility of the *Employer* to provide the insurances stated in the Contract Data.
- 87.3 The *Contractor* may insure a risk which this contract requires the *Employer* to insure if the *Employer* does not submit a required policy or certificate. The cost of this insurance to the *Contractor* is paid by the *Employer*.

9 Termination

Termination 90

- 90.1 If either Party wishes to terminate the *Contractor's* obligation to Provide the Works he notifies the *Project Manager* and the other Party giving details of his reason for terminating. The *Project Manager* issues a termination certificate to both Parties promptly if the reason complies with this contract.
- 90.2 The *Contractor* may terminate only for a reason identified in the Termination Table. The *Employer* may terminate for any reason. The procedures followed and the amounts due on termination are in accordance with the Termination Table.

TERMINATION TABLE

Terminating Party	Reason	Procedure	Amount due
The <i>Employer</i>	A reason other than R1–R21	P1 and P2	A1, A2 and A4
	R1–R15 or R18	P1, P2 and P3	A1 and A3
	R17 or R20	P1 and P3	A1 and A2
	R21	P1 and P4	A1 and A2
The <i>Contractor</i>	R1–R10, R16 or R19	P1 and P4	A1, A2 and A4
	R17 or R20	P1 and P4	A1 and A2

- 90.3 The procedures for termination are implemented immediately after the *Project Manager* has issued a termination certificate.
- 90.4 Within thirteen weeks of termination, the *Project Manager* certifies a final payment to or from the *Contractor* which is the *Project Manager's* assessment of the amount due on termination less the total of previous payments. Payment is made within three weeks of the *Project Manager's* certificate.
- 90.5 After a termination certificate has been issued, the *Contractor* does no further work necessary to Provide the Works.

Reasons for termination 91

- 91.1 Either Party may terminate if the other Party has done one of the following or its equivalent.
- If the other Party is an individual and has
 - presented his petition for bankruptcy (R1),
 - had a bankruptcy order made against him (R2),
 - had a receiver appointed over his assets (R3) or
 - made an arrangement with his creditors (R4).
 - If the other Party is a company or partnership and has
 - had a winding-up order made against it (R5),
 - had a provisional liquidator appointed to it (R6),
 - passed a resolution for winding-up (other than in order to amalgamate or reconstruct) (R7),
 - had an administration order made against it (R8),
 - had a receiver, receiver and manager, or administrative receiver appointed over the whole or a substantial part of its undertaking or assets (R9) or
 - made an arrangement with its creditors (R10).

- 91.2 The *Employer* may terminate if the *Project Manager* has notified that the *Contractor* has defaulted in one of the following ways and not put the default right within four weeks of the notification.
- Substantially failed to comply with his obligations (R11).
 - Not provided a bond or guarantee which this contract requires (R12).
 - Appointed a Subcontractor for substantial work before the *Project Manager* has accepted the Subcontractor (R13).
- 91.3 The *Employer* may terminate if the *Project Manager* has notified that the *Contractor* has defaulted in one of the following ways and not stopped defaulting within four weeks of the notification.
- Substantially hindered the *Employer* or Others (R14).
 - Substantially broken a health or safety regulation (R15).
- 91.4 The *Contractor* may terminate if the *Employer* has not paid an amount certified by the *Project Manager* within thirteen weeks of the date of the certificate (R16).
- 91.5 Either Party may terminate if the Parties have been released under the law from further performance of the whole of this contract (R17).
- 91.6 If the *Project Manager* has instructed the *Contractor* to stop or not to start any substantial work or all work and an instruction allowing the work to re-start or start has not been given within thirteen weeks,
- the *Employer* may terminate if the instruction was due to a default by the *Contractor* (R18),
 - the *Contractor* may terminate if the instruction was due to a default by the *Employer* (R19) and
 - either Party may terminate if the instruction was due to any other reason (R20).
- 91.7 The *Employer* may terminate if an event occurs which
- stops the *Contractor* completing the *works* or
 - stops the *Contractor* completing the *works* by the date shown on the Accepted Programme and is forecast to delay Completion by more than 13 weeks,
- and which
- neither Party could prevent and
 - an experienced contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable for him to have allowed for it (R21).

**Procedures on
termination 92**

- 92.1 On termination, the *Employer* may complete the *works* and may use any Plant and Materials to which he has title (P1).
- 92.2 The procedure on termination also includes one or more of the following as set out in the Termination Table.
- P2 The *Employer* may instruct the *Contractor* to leave the Site, remove any Equipment, Plant and Materials from the Site and assign the benefit of any subcontract or other contract related to performance of this contract to the *Employer*.
- P3 The *Employer* may use any Equipment to which the *Contractor* has title to complete the *works*. The *Contractor* promptly removes the Equipment from Site when the *Project Manager* notifies him that the *Employer* no longer requires it to complete the *works*.
- P4 The *Contractor* leaves the Working Areas and removes the Equipment.

Payment on termination 93

- 93.1 The amount due on termination includes (A1)
- an amount due assessed as for normal payments,
 - the Defined Cost for Plant and Materials
 - within the Working Areas or
 - to which the *Employer* has title and of which the *Contractor* has to accept delivery,
 - other Defined Cost reasonably incurred in expectation of completing the whole of the *works*,
 - any amounts retained by the *Employer* and
 - a deduction of any un-repaid balance of an advanced payment.
- 93.2 The amount due on termination also includes one or more of the following as set out in the Termination Table.
- A2 The forecast Defined Cost of removing the Equipment.
- A3 A deduction of the forecast of the additional cost to the *Employer* of completing the whole of the *works*.
- A4 The *direct fee percentage* applied to any excess of the total of the Prices at the Contract Date over the Price for Work Done to Date.
- 93.3 The amount due on termination is assessed without taking grouping of activities into account.

DISPUTE RESOLUTION

Option W1

Dispute resolution procedure (used unless the United Kingdom Housing Grants, Construction and Regeneration Act 1996 applies).

Dispute resolution W1

W1.1 A dispute arising under or in connection with this contract is referred to and decided by the *Adjudicator*.

The Adjudicator W1.2 (1) The Parties appoint the *Adjudicator* under the NEC Adjudicator's Contract current at the *starting date*.

(2) The *Adjudicator* acts impartially and decides the dispute as an independent adjudicator and not as an arbitrator.

(3) If the *Adjudicator* is not identified in the Contract Data or if the *Adjudicator* resigns or is unable to act, the Parties choose a new adjudicator jointly. If the Parties have not chosen an adjudicator, either Party may ask the *Adjudicator nominating body* to choose one. The *Adjudicator nominating body* chooses an adjudicator within four days of the request. The chosen adjudicator becomes the *Adjudicator*.

(4) A replacement *Adjudicator* has the power to decide a dispute referred to his predecessor but not decided at the time when the predecessor resigned or became unable to act. He deals with an undecided dispute as if it had been referred to him on the date he was appointed.

(5) The *Adjudicator*, his employees and agents are not liable to the Parties for any action or failure to take action in an adjudication unless the action or failure to take action was in bad faith.

The adjudication W1.3 (1) Disputes are notified and referred to the *Adjudicator* in accordance with the Adjudication Table.

ADJUDICATION TABLE

Dispute about	Which Party may refer it to the <i>Adjudicator</i> ?	When may it be referred to the <i>Adjudicator</i> ?
An action of the <i>Project Manager</i> or the <i>Supervisor</i>	The <i>Contractor</i>	Between two and four weeks after the <i>Contractor's</i> notification of the dispute to the <i>Employer</i> and the <i>Project Manager</i> , the notification itself being made not more than four weeks after the <i>Contractor</i> becomes aware of the action
The <i>Project Manager</i> or <i>Supervisor</i> not having taken an action	The <i>Contractor</i>	Between two and four weeks after the <i>Contractor's</i> notification of the dispute to the <i>Employer</i> and the <i>Project Manager</i> , the notification itself being made not more than four weeks after the <i>Contractor</i> becomes aware that the action was not taken
A quotation for a compensation event which is treated as having been accepted	The <i>Employer</i>	Between two and four weeks after the <i>Project Manager's</i> notification of the dispute to the <i>Employer</i> and the <i>Contractor</i> , the notification itself being made not more than four weeks after the quotation was treated as accepted
Any other matter	Either Party	Between two and four weeks after notification of the dispute to the other Party and the <i>Project Manager</i>

(2) The times for notifying and referring a dispute may be extended by the *Project Manager* if the *Contractor* and the *Project Manager* agree to the extension before the notice or referral is due. The *Project Manager* notifies the extension that has been agreed to the *Contractor*. If a disputed matter is not notified and referred within the times set out in this contract, neither Party may subsequently refer it to the *Adjudicator* or the *tribunal*.

(3) The Party referring the dispute to the *Adjudicator* includes with his referral information to be considered by the *Adjudicator*. Any more information from a Party to be considered by the *Adjudicator* is provided within four weeks of the referral. This period may be extended if the *Adjudicator* and the Parties agree.

(4) If a matter disputed by the *Contractor* under or in connection with a subcontract is also a matter disputed under or in connection with this contract and if the subcontract allows, the *Contractor* may refer the subcontract dispute to the *Adjudicator* at the same time as the main contract referral. The *Adjudicator* then decides the disputes together and references to the Parties for the purposes of the dispute are interpreted as including the Subcontractor.

(5) The *Adjudicator* may

- review and revise any action or inaction of the *Project Manager* or *Supervisor* related to the dispute and alter a quotation which has been treated as having been accepted,
- take the initiative in ascertaining the facts and the law related to the dispute,
- instruct a Party to provide further information related to the dispute within a stated time and
- instruct a Party to take any other action which he considers necessary to reach his decision and to do so within a stated time.

(6) A communication between a Party and the *Adjudicator* is communicated to the other Party at the same time.

(7) If the *Adjudicator's* decision includes assessment of additional cost or delay caused to the *Contractor*, he makes his assessment in the same way as a compensation event is assessed.

(8) The *Adjudicator* decides the dispute and notifies the Parties and the *Project Manager* of his decision and his reasons within four weeks of the end of the period for receiving information. This four week period may be extended if the Parties agree.

(9) Unless and until the *Adjudicator* has notified the Parties of his decision, the Parties, the *Project Manager* and the *Supervisor* proceed as if the matter disputed was not disputed.

(10) The *Adjudicator's* decision is binding on the Parties unless and until revised by the *tribunal* and is enforceable as a matter of contractual obligation between the Parties and not as an arbitral award. The *Adjudicator's* decision is final and binding if neither Party has notified the other within the times required by this contract that he is dissatisfied with a decision of the *Adjudicator* and intends to refer the matter to the *tribunal*.

(11) The *Adjudicator* may, within two weeks of giving his decision to the Parties, correct any clerical mistake or ambiguity.

Review by the *tribunal* W1.4

(1) A Party does not refer any dispute under or in connection with this contract to the *tribunal* unless it has first been referred to the *Adjudicator* in accordance with this contract.

(2) If, after the *Adjudicator* notifies his decision a Party is dissatisfied, he may notify the other Party that he intends to refer it to the *tribunal*. A Party may not refer a dispute to the *tribunal* unless this notification is given within four weeks of notification of the *Adjudicator's* decision.

(3) If the *Adjudicator* does not notify his decision within the time provided by this contract, a Party may notify the other Party that he intends to refer the dispute to the *tribunal*. A Party may not refer a dispute to the *tribunal* unless this notification is given within four weeks of the date by which the *Adjudicator* should have notified his decision.

(4) The *tribunal* settles the dispute referred to it. The *tribunal* has the powers to reconsider any decision of the *Adjudicator* and review and revise any action or inaction of the *Project Manager* or the *Supervisor* related to the dispute. A Party is not limited in the *tribunal* proceedings to the information, evidence or arguments put to the *Adjudicator*.

(5) If the *tribunal* is arbitration, the *arbitration procedure*, the place where the arbitration is to be held and the method of choosing the arbitrator are those stated in the Contract Data.

(6) A Party does not call the *Adjudicator* as a witness in *tribunal* proceedings.

Option W2

Dispute resolution procedure (used in the United Kingdom when the Housing Grants, Construction and Regeneration Act 1996 applies).

Dispute resolution W2

W2.1 (1) A dispute arising under or in connection with this contract is referred to and decided by the *Adjudicator*. A Party may refer a dispute to the *Adjudicator* at any time.

(2) In this Option, time periods stated in days exclude Christmas Day, Good Friday and bank holidays.

The *Adjudicator* W2.2

(1) The Parties appoint the *Adjudicator* under the NEC Adjudicator's Contract current at the *starting date*.

(2) The *Adjudicator* acts impartially and decides the dispute as an independent adjudicator and not as an arbitrator.

(3) If the *Adjudicator* is not identified in the Contract Data or if the *Adjudicator* resigns or becomes unable to act

- the Parties may choose an adjudicator jointly or
- a Party may ask the *Adjudicator nominating body* to choose an adjudicator.

The *Adjudicator nominating body* chooses an adjudicator within four days of the request. The chosen adjudicator becomes the *Adjudicator*.

(4) A replacement *Adjudicator* has the power to decide a dispute referred to his predecessor but not decided at the time when his predecessor resigned or became unable to act. He deals with an undecided dispute as if it had been referred to him on the date he was appointed.

(5) The *Adjudicator*, his employees and agents are not liable to the Parties for any action or failure to take action in an adjudication unless the action or failure to take action was in bad faith.

The adjudication W2.3

(1) Before a Party refers a dispute to the *Adjudicator*, he gives a notice of adjudication to the other Party with a brief description of the dispute and the decision which he wishes the *Adjudicator* to make. If the *Adjudicator* is named in the Contract Data, the Party sends a copy of the notice of adjudication to the *Adjudicator* when it is issued. Within three days of the receipt of the notice of adjudication, the *Adjudicator* notifies the Parties

- that he is able to decide the dispute in accordance with the contract or
- that he is unable to decide the dispute and has resigned.

If the *Adjudicator* does not so notify within three days of the issue of the notice of adjudication, either Party may act as if he has resigned.

(2) Within seven days of a Party giving a notice of adjudication he

- refers the dispute to the *Adjudicator*,
- provides the *Adjudicator* with the information on which he relies, including any supporting documents and
- provides a copy of the information and supporting documents he has provided to the *Adjudicator* to the other Party.

Any further information from a Party to be considered by the *Adjudicator* is provided within fourteen days of the referral. This period may be extended if the *Adjudicator* and the Parties agree.

(3) If a matter disputed by the *Contractor* under or in connection with a subcontract is also a matter disputed under or in connection with this contract, the *Contractor* may, with the consent of the Subcontractor, refer the subcontract dispute to the *Adjudicator* at the same time as the main contract referral. The *Adjudicator* then decides the disputes together and references to the Parties for the purposes of the dispute are interpreted as including the Subcontractor.

(4) The *Adjudicator* may

- review and revise any action or inaction of the *Project Manager* or *Supervisor* related to the dispute and alter a quotation which has been treated as having been accepted,
- take the initiative in ascertaining the facts and the law related to the dispute,
- instruct a Party to provide further information related to the dispute within a stated time and
- instruct a Party to take any other action which he considers necessary to reach his decision and to do so within a stated time.

(5) If a Party does not comply with any instruction within the time stated by the *Adjudicator*, the *Adjudicator* may continue the adjudication and make his decision based upon the information and evidence he has received.

(6) A communication between a Party and the *Adjudicator* is communicated to the other Party at the same time.

(7) If the *Adjudicator's* decision includes assessment of additional cost or delay caused to the *Contractor*, he makes his assessment in the same way as a compensation event is assessed.

(8) The *Adjudicator* decides the dispute and notifies the Parties and the *Project Manager* of his decision and his reasons within twenty-eight days of the dispute being referred to him. This period may be extended by up to fourteen days with the consent of the referring Party or by any other period agreed by the Parties.

(9) Unless and until the *Adjudicator* has notified the Parties of his decision, the Parties, the *Project Manager* and the *Supervisor* proceed as if the matter disputed was not disputed.

(10) If the *Adjudicator* does not make his decision and notify it to the Parties within the time provided by this contract, the Parties and the *Adjudicator* may agree to extend the period for making his decision. If they do not agree to an extension, either Party may act as if the *Adjudicator* has resigned.

(11) The *Adjudicator's* decision is binding on the Parties unless and until revised by the *tribunal* and is enforceable as a matter of contractual obligation between the Parties and not as an arbitral award. The *Adjudicator's* decision is final and binding if neither Party has notified the other within the times required by this contract that he is dissatisfied with a matter decided by the *Adjudicator* and intends to refer the matter to the *tribunal*.

(12) The *Adjudicator* may, within fourteen days of giving his decision to the Parties, correct a clerical mistake or ambiguity.

Review by the *tribunal* W2.4

(1) A Party does not refer any dispute under or in connection with this contract to the *tribunal* unless it has first been decided by the *Adjudicator* in accordance with this contract.

(2) If, after the *Adjudicator* notifies his decision a Party is dissatisfied, that Party may notify the other Party of the matter which he disputes and state that he intends to refer it to the *tribunal*. The dispute may not be referred to the *tribunal* unless this notification is given within four weeks of the notification of the *Adjudicator's* decision.

(3) The *tribunal* settles the dispute referred to it. The *tribunal* has the powers to reconsider any decision of the *Adjudicator* and to review and revise any action or inaction of the *Project Manager* or the *Supervisor* related to the dispute. A Party is not limited in *tribunal* proceedings to the information or evidence put to the *Adjudicator*.

(4) If the *tribunal* is arbitration, the *arbitration procedure*, the place where the arbitration is to be held and the method of choosing the arbitrator are those stated in the Contract Data.

(5) A Party does not call the *Adjudicator* as a witness in *tribunal* proceedings.

SECONDARY OPTION CLAUSES

Option X1: Price adjustment for inflation

Defined terms X1

- X1.1 (a) The Base Date Index (B) is the latest available index before the *base date*.
- (b) The Latest Index (L) is the latest available index before the date of assessment of an amount due.
- (c) The Price Adjustment Factor is the total of the products of each of the proportions stated in the Contract Data multiplied by $(L - B)/B$ for the index linked to it.

Price Adjustment Factor X1.2

If an index is changed after it has been used in calculating a Price Adjustment Factor, the calculation is repeated and a correction included in the next assessment of the amount due.

The Price Adjustment Factor calculated at the Completion Date for the whole of the *works* is used for calculating price adjustment after this date.

Compensation events X1.3

The Defined Cost for compensation events is assessed using the

- Defined Cost current at the time of assessing the compensation event adjusted to *base date* by dividing by one plus the Price Adjustment Factor for the last assessment of the amount due and
- Defined Cost at *base date* levels for amounts calculated from rates stated in the Contract Data for employees and Equipment.

Price adjustment X1.4

Each amount due includes an amount for price adjustment which is the sum of

- the change in the Price for Work Done to Date since the last assessment of the amount due multiplied by the Price Adjustment Factor for the date of the current assessment,
- the amount for price adjustment included in the previous amount due and
- correcting amounts, not included elsewhere, which arise from changes to indices used for assessing previous amounts for price adjustment.

Option X2: Changes in the law

Changes in the law X2

- X2.1 A change in the law of the country in which the Site is located is a compensation event if it occurs after the Contract Date. The *Project Manager* may notify the *Contractor* of a compensation event for a change in the law and instruct him to submit quotations. If the effect of a compensation event which is a change in the law is to reduce the total Defined Cost, the Prices are reduced.

Option X3: Multiple currencies

Multiple currencies X3

- X3.1 The *Contractor* is paid in currencies other than the *currency of this contract* for the items or activities listed in the Contract Data. The *exchange rates* are used to convert from the *currency of this contract* to other currencies.
- X3.2 Payments to the *Contractor* in currencies other than the *currency of this contract* do not exceed the maximum amounts stated in the Contract Data. Any excess is paid in the *currency of this contract*.

Option X4: Parent company guarantee

Parent company guarantee X4

- X4.1 If a parent company owns the *Contractor*, the *Contractor* gives to the *Employer* a guarantee by the parent company of the *Contractor's* performance in the form set out in the Works Information. If the guarantee was not given by the Contract Date, it is given to the *Employer* within four weeks of the Contract Date.

Option X5: Sectional Completion

Sectional Completion X5

- X5.1 In these *conditions of contract*, unless stated as the whole of the *works*, each reference and clause relevant to
- the *works*,
 - Completion and
 - Completion Date
- applies, as the case may be, to either the whole of the *works* or any *section* of the *works*.

Option X6: Bonus for early Completion

Bonus for early Completion X6

X6.1 The *Contractor* is paid a bonus calculated at the rate stated in the Contract Data for each day from the earlier of

- Completion and
- the date on which the *Employer* takes over the *works*

until the Completion Date.

Option X7: Delay damages

Delay damages X7

X7.1 The *Contractor* pays delay damages at the rate stated in the Contract Data from the Completion Date for each day until the earlier of

- Completion and
- the date on which the *Employer* takes over the *works*.

X7.2 If the Completion Date is changed to a later date after delay damages have been paid, the *Employer* repays the overpayment of damages with interest. Interest is assessed from the date of payment to the date of repayment and the date of repayment is an assessment date.

X7.3 If the *Employer* takes over a part of the *works* before Completion, the delay damages are reduced from the date on which the part is taken over. The *Project Manager* assesses the benefit to the *Employer* of taking over the part of the *works* as a proportion of the benefit to the *Employer* of taking over the whole of the *works* not previously taken over. The delay damages are reduced in this proportion.

Option X12: Partnering

Identified and defined X12

terms X12.1

(1) The Partners are those named in the Schedule of Partners. The *Client* is a Partner.

(2) An Own Contract is a contract between two Partners which includes this Option.

(3) The Core Group comprises the Partners listed in the Schedule of Core Group Members.

(4) Partnering Information is information which specifies how the Partners work together and is either in the documents which the Contract Data states it is in or in an instruction given in accordance with this contract.

(5) A Key Performance Indicator is an aspect of performance for which a target is stated in the Schedule of Partners.

- Actions** X12.2
- (1) Each Partner works with the other Partners to achieve the *Client's objective* stated in the Contract Data and the objectives of every other Partner stated in the Schedule of Partners.
 - (2) Each Partner nominates a representative to act for it in dealings with other Partners.
 - (3) The Core Group acts and takes decisions on behalf of the Partners on those matters stated in the Partnering Information.
 - (4) The Partners select the members of the Core Group. The Core Group decides how they will work and decides the dates when each member joins and leaves the Core Group. The *Client's* representative leads the Core Group unless stated otherwise in the Partnering Information.
 - (5) The Core Group keeps the Schedule of Core Group Members and the Schedule of Partners up to date and issues copies of them to the Partners each time either is revised.
 - (6) This Option does not create a legal partnership between Partners who are not one of the Parties in this contract.

- Working together** X12.3
- (1) The Partners work together as stated in the Partnering Information and in a spirit of mutual trust and co-operation.
 - (2) A Partner may ask another Partner to provide information which he needs to carry out the work in his Own Contract and the other Partner provides it.
 - (3) Each Partner gives an early warning to the other Partners when he becomes aware of any matter that could affect the achievement of another Partner's objectives stated in the Schedule of Partners.
 - (4) The Partners use common information systems as set out in the Partnering Information.
 - (5) A Partner implements a decision of the Core Group by issuing instructions in accordance with its Own Contracts.
 - (6) The Core Group may give an instruction to the Partners to change the Partnering Information. Each such change to the Partnering Information is a compensation event which may lead to reduced Prices.
 - (7) The Core Group prepares and maintains a timetable showing the proposed timing of the contributions of the Partners. The Core Group issues a copy of the timetable to the Partners each time it is revised. The *Contractor* changes his programme if it is necessary to do so in order to comply with the revised timetable. Each such change is a compensation event which may lead to reduced Prices.
 - (8) A Partner gives advice, information and opinion to the Core Group and to other Partners when asked to do so by the Core Group. This advice, information and opinion relates to work that another Partner is to carry out under its Own Contract and is given fully, openly and objectively. The Partners show contingency and risk allowances in information about costs, prices and timing for future work.
 - (9) A Partner notifies the Core Group before subcontracting any work.

- Incentives** X12.4
- (1) A Partner is paid the amount stated in the Schedule of Partners if the target stated for a Key Performance Indicator is improved upon or achieved. Payment of the amount is due when the target has been improved upon or achieved and is made as part of the amount due in the Partner's Own Contract.
 - (2) The *Client* may add a Key Performance Indicator and associated payment to the Schedule of Partners but may not delete or reduce a payment stated in the Schedule of Partners.

Option X13: Performance bond

Performance bond X13

- X13.1 The *Contractor* gives the *Employer* a performance bond, provided by a bank or insurer which the *Project Manager* has accepted, for the amount stated in the Contract Data and in the form set out in the Works Information. A reason for not accepting the bank or insurer is that its commercial position is not strong enough to carry the bond. If the bond was not given by the Contract Date, it is given to the *Employer* within four weeks of the Contract Date.

Option X14: Advanced payment to the *Contractor*

Advanced payment X14

- X14.1 The *Employer* makes an advanced payment to the *Contractor* of the amount stated in the Contract Data.
- X14.2 The advanced payment is made either within four weeks of the Contract Date or, if an advanced payment bond is required, within four weeks of the later of
- the Contract Date and
 - the date when the *Employer* receives the advanced payment bond.

The advanced payment bond is issued by a bank or insurer which the *Project Manager* has accepted. A reason for not accepting the proposed bank or insurer is that its commercial position is not strong enough to carry the bond. The bond is for the amount of the advanced payment which the *Contractor* has not repaid and is in the form set out in the Works Information. Delay in making the advanced payment is a compensation event.

- X14.3 The advanced payment is repaid to the *Employer* by the *Contractor* in instalments of the amount stated in the Contract Data. An instalment is included in each amount due assessed after the period stated in the Contract Data has passed until the advanced payment has been repaid.

Option X15: Limitation of the *Contractor's* liability for his design to reasonable skill and care

The *Contractor's* design X15

- X15.1 The *Contractor* is not liable for Defects in the *works* due to his design so far as he proves that he used reasonable skill and care to ensure that his design complied with the Works Information.
- X15.2 If the *Contractor* corrects a Defect for which he is not liable under this contract it is a compensation event.

Option X16: Retention

Retention X16

X16.1 After the Price for Work Done to Date has reached the *retention free amount*, an amount is retained in each amount due. Until the earlier of

- Completion of the whole of the *works* and
- the date on which the *Employer* takes over the whole of the *works*

the amount retained is the *retention percentage* applied to the excess of the Price for Work Done to Date above the *retention free amount*.

X16.2 The amount retained is halved

- in the assessment made at Completion of the whole of the *works* or
- in the next assessment after the *Employer* has taken over the whole of the *works* if this is before Completion of the whole of the *works*.

The amount retained remains at this amount until the Defects Certificate is issued. No amount is retained in the assessments made after the Defects Certificate has been issued.

Option X17: Low performance damages

Low performance X17

damages X17.1 If a Defect included in the Defects Certificate shows low performance with respect to a performance level stated in the Contract Data, the *Contractor* pays the amount of low performance damages stated in the Contract Data.

Option X18: Limitation of liability

Limitation of liability X18

X18.1 The *Contractor's* liability to the *Employer* for the *Employer's* indirect or consequential loss is limited to the amount stated in the Contract Data.

X18.2 For any one event, the liability of the *Contractor* to the *Employer* for loss of or damage to the *Employer's* property is limited to the amount stated in the Contract Data.

X18.3 The *Contractor's* liability to the *Employer* for Defects due to his design which are not listed on the Defects Certificate is limited to the amount stated in the Contract Data.

X18.4 The *Contractor's* total liability to the *Employer* for all matters arising under or in connection with this contract, other than the excluded matters, is limited to the amount stated in the Contract Data and applies in contract, tort or delict and otherwise to the extent allowed under the *law of the contract*.

The excluded matters are amounts payable by the *Contractor* as stated in this contract for

- loss of or damage to the *Employer's* property,
- delay damages if Option X7 applies and
- low performance damages if Option X17 applies.

X18.5 The *Contractor* is not liable to the *Employer* for a matter unless it is notified to the *Contractor* before the *end of liability date*.

Option X20: Key Performance Indicators (not used with Option X12)

- Incentives**
- X20.1 A Key Performance Indicator is an aspect of performance by the *Contractor* for which a target is stated in the Incentive Schedule. The Incentive Schedule is the *incentive schedule* unless later changed in accordance with this contract.
 - X20.2 From the *starting date* until the Defects Certificate has been issued, the *Contractor* reports to the *Project Manager* his performance against each of the Key Performance Indicators. Reports are provided at the intervals stated in the Contract Data and include the forecast final measurement against each indicator.
 - X20.3 If the *Contractor's* forecast final measurement against a Key Performance Indicator will not achieve the target stated in the Incentive Schedule, he submits to the *Project Manager* his proposals for improving performance.
 - X20.4 The *Contractor* is paid the amount stated in the Incentive Schedule if the target stated for a Key Performance Indicator is improved upon or achieved. Payment of the amount is due when the target has been improved upon or achieved.
 - X20.5 The *Employer* may add a Key Performance Indicator and associated payment to the Incentive Schedule but may not delete or reduce a payment stated in the Incentive Schedule.

OPTION Y

Option Y(UK)2: The Housing Grants, Construction and Regeneration Act 1996

Definitions	Y(UK)2	
	Y2.1	(1) The Act is The Housing Grants, Construction and Regeneration Act 1996. (2) A period of time stated in days is a period calculated in accordance with Section 116 of the Act.
Dates for payment	Y2.2	The date on which a payment becomes due is seven days after the assessment date. The final date for payment is fourteen days or a different period for payment if stated in the Contract Data after the date on which payment becomes due. The <i>Project Manager's</i> certificate is the notice of payment from the <i>Employer</i> to the <i>Contractor</i> specifying the amount of the payment made or proposed to be made and stating how the amount was calculated.
Notice of intention to withhold payment	Y2.3	If either Party intends to withhold payment of an amount due under this contract, he notifies the other Party not later than seven days (the prescribed period) before the final date for payment by stating the amount proposed to be withheld and the reason for withholding payment. If there is more than one reason, the amount for each reason is stated. A Party does not withhold payment of an amount due under this contract unless he has notified his intention to withhold payment as required by this contract.
Suspension of performance	Y2.4	If the <i>Contractor</i> exercises his right under the Act to suspend performance, it is a compensation event.

Option Y(UK)3: The Contracts (Rights of Third Parties) Act 1999

Third party rights	Y(UK)3	
	Y3.1	A person or organisation who is not one of the Parties may enforce a term of this contract under the Contracts (Rights of Third Parties) Act 1999 only if the term and the person or organisation are stated in the Contract Data.

Option Z: *Additional conditions of contract*

Additional conditions of contract	Z1	
	Z1.1	The <i>additional conditions of contract</i> stated in the Contract Data are part of this contract.

SHORTER SCHEDULE OF COST COMPONENTS

An amount is included only in one cost component and only if it is incurred in order to Provide the Works.

People 1	The following components of the cost of <ul style="list-style-type: none">• people who are directly employed by the <i>Contractor</i> and whose normal place of working is within the Working Areas,• people who are directly employed by the <i>Contractor</i> and whose normal place of working is not within the Working Areas but who are working in the Working Areas and• people who are not directly employed by the <i>Contractor</i> but are paid for by him according to the time worked while they are within the Working Areas.
11	Amounts paid by the <i>Contractor</i> including those for meeting the requirements of the law and for pension provision.
Equipment 2	The following components of the cost of Equipment which is used within the Working Areas (including the cost of accommodation but excluding Equipment cost covered by the percentage for people overheads).
21	Amounts for Equipment which is in the published list stated in the Contract Data. These amounts are calculated by applying the percentage adjustment for listed Equipment stated in the Contract Data to the rates in the published list and by multiplying the resulting rate by the time for which the Equipment is required.
22	Amounts for Equipment listed in the Contract Data which is not in the published list stated in the Contract Data. These amounts are the rates stated in the Contract Data multiplied by the time for which the Equipment is required.
23	The time required is expressed in hours, days, weeks or months consistently with the list of items of Equipment in the Contract Data or with the published list stated in the Contract Data.
24	Unless the item is in the published list and the rate includes the cost component, payments for <ul style="list-style-type: none">• transporting Equipment to and from the Working Areas other than for repair and maintenance,• erecting and dismantling Equipment and• constructing, fabricating or modifying Equipment as a result of a compensation event.
25	Unless the item is in the published list and the rate includes the cost component, the purchase price of Equipment which is consumed.
26	Unless included in the rate in the published list, the cost of operatives is included in the cost of people.
27	Amounts for Equipment which is neither in the published list stated in the Contract Data nor listed in the Contract Data, at competitively tendered or open market rates, multiplied by the time for which the Equipment is required.

Plant and Materials	3	The following components of the cost of Plant and Materials.
31		Payments for purchasing Plant and Materials, delivery to and removal from the Working Areas, providing and removing packaging and samples and tests.
32		Cost is credited with payments received for disposal of Plant and Materials unless the cost is disallowed.
Charges	4	The following components of the cost of charges paid by the <i>Contractor</i> .
41		A charge calculated by applying the percentage for people overheads stated in the Contract Data to people item 11 to cover the costs of <ul style="list-style-type: none"> • payments for the provision and use in the Working Areas of water, gas and electricity, • payments for buying or leasing land, compensation for loss of crops or buildings, royalties, inspection certificates, charges for access to the Working Areas, facilities for visits to the Working Areas by Others and • payments for equipment, supplies and services for offices, drawing office, laboratories, workshops, stores and compounds, labour camps, cabins, catering, medical facilities and first aid, recreation, sanitation, security, copying, telephone, telex, fax, radio, CCTV, surveying and setting out, computing, and hand tools not powered by compressed air.
42		Payments for cancellation charges arising from a compensation event.
43		Payments to public authorities and other properly constituted authorities of charges which they are authorised to make in respect of the <i>works</i> .
44		Consumables and equipment provided by the <i>Contractor</i> for the <i>Project Manager's</i> and <i>Supervisor's</i> office.
45		Specialist services.
Manufacture and fabrication	5	The following components of the cost of manufacture and fabrication of Plant and Materials, which are <ul style="list-style-type: none"> • wholly or partly designed specifically for the <i>works</i> and • manufactured or fabricated outside the Working Areas.
51		Amounts paid by the <i>Contractor</i> .
Design	6	The following components of the cost of design of the <i>works</i> and Equipment done outside the Working Areas.
61		The total of the hours worked by employees multiplied by the hourly rates stated in the Contract Data for the categories of employees listed.
62		An amount for overheads calculated by multiplying this total by the percentage for design overheads stated in the Contract Data.
63		The cost of travel to and from the Working Areas for the categories of design employees listed in the Contract Data.
Insurance	7	The following are deducted from cost <ul style="list-style-type: none"> • costs against which this contract required the <i>Contractor</i> to insure and • other costs paid to the <i>Contractor</i> by insurers.



**Custom House and London City Airport Escalator Repair
Works**

2018-055-01

**Schedule 1
Amendments to Conditions of Contract**

SCHEDULE 1 - THE "Z" CLAUSES

Z1 Amendments to Core clauses and Main Option clauses

Z1.2 The Core clauses, Main Option A clauses and the Secondary Option clauses are amended as follows

Clause 11.2(1) At the end insert: "Neither the Accepted Programme, nor any method statement attached to the Accepted Programme, form part of the Works Information".

Clause 11.2(4) Delete and substitute:

"The Contract Date is the date of the Contract Agreement."

Clause 11.2(5) At the end of first bullet point insert: "the *Contractor's* obligations under this contract or".

In the second bullet point after "the applicable law" insert the words "or all applicable licences and approvals".

Clause 11.2(11) After *Employer* insert "(which expression includes its successors in title and permitted assigns)".

Clause 11.2(17) In the first sentence, after "organisation" insert "including, without limitation any sub-consultant"

In the first bullet point, after "install" insert "or design".

Clause 11.2(19) In the first line delete the word "either".

In the first bullet point after *works* delete "or" and insert "and/or".

Clause 11.2 Insert the following new definitions

"(34) Background IPR means IPR owned by the *Contractor* or a Subcontractor or other third party and which is not assigned to the *Employer* pursuant to clause 22.1.

(35) CDM Regulations are the Construction (Design and Management) Regulations 2015 and any amendment, consolidation, revision and/or replacement thereto and related code of practice together with any requirements issued from time to time by the Health and



Safety Executive.

- (36) Cessation Plan means a plan agreed between the Parties or determined by the *Employer* pursuant to:
- clause 94 to give effect to a Declaration of Ineffectiveness, or
 - clause 95 to give effect to a Public Procurement Termination Event.
- (37) Construction Industry Scheme means the provisions of Chapter 3 of Part 3 of the Finance Act 2004 (Construction Industry Scheme) together with any regulations made pursuant to these provisions, including the Income Tax (Construction Industry Scheme) Regulations 2005.
- (38) The Contract Agreement is the document executed by the *Employer* and the *Contractor* under which the *Contractor* has agreed to Provide the Works.
- (39) Contract Information means (i) this contract in its entirety (including from time to time agreed changes to this contract) and (ii) data extracted from invoices submitted by the *Contractor* which consists of the *Contractor's* name, the expenditure account code, the expenditure account code description, the SAP document number, the clearing date and the invoice amount.
- (40) Declaration of Ineffectiveness means a declaration of ineffectiveness in relation to this contract made by a Court of competent jurisdiction pursuant to Regulation 99 of the Public Contracts Regulations 2015 or Regulation 45(k) of the Utilities Contracts Regulations 2006 (as amended).
- (41) Dispute means any dispute, controversy or claim arising out of or in connection with this contract.
- (42) Holding Company means any company which from time to time directly or indirectly controls the *Contractor* where "control" is as defined by Section 1124 of the Corporation Tax Act 2010.
- (43) Indirect Subcontractor means any subcontractor or subconsultant of whatever tier beneath any Subcontractor appointed in relation to the *works*.



- (44) Insolvency means (in the case of a company or partnership) the making of a winding-up order against it, the appointment of a provisional liquidator, the passing of a resolution for winding-up (other than in order to amalgamate or reconstruct without insolvency), the making of an administration order against it, the appointment of a receiver, receiver and manager, or administrative receiver over the whole or a substantial part of its undertaking or assets, or the making of an arrangement with its creditors or (in the case of an individual) the presentation of a petition for bankruptcy, the making of a bankruptcy order against him, the appointment of a receiver over his assets or the making of an arrangement with his creditor.
- (45) IPR means intellectual property rights including patents, trade marks or names, service marks, trade names, design rights (in each case whether registered or unregistered), copyright but excluding proprietary software details (including rights in computer and databases), moral rights, rights in know-how, rights in domain names, rights in passing off, database right, rights in commercial or technical information, any other rights in any invention, discovery or process and any other intellectual property rights, (including any professional, manufacturer's or supplier's warranties and/or indemnities) in each case whether registered or unregistered, and including applications for the grant of any such rights and all rights or forms of protection having equivalent or similar effect anywhere in the world.
- (46) Notice of Adjudication means any notice given by a party to the Dispute to the other party or parties thereto requiring reference of a Dispute to the *Adjudicator* in accordance with clause W2.1. The Notice of Adjudication includes
- the nature and a brief description of the Dispute,
 - details of where and when the Dispute arose, and
 - the nature of the redress which is sought.
- (47) Prevention Event has the meaning ascribed to that term in clause 19.1.
- (48) Senior Representative means a representative of a Party at senior executive level.
- (49) A Statutory Requirement is



- any Act of Parliament
- any instrument, rule or order made under any Act of Parliament
- any regulation or bylaw of any local authority or of any Statutory Undertaker which has any jurisdiction with regard to the *works* or with whose systems the same are or will be connected including any statutory provisions and
- any decisions of a relevant authority under the statutory provisions which control the right to develop the site on which the *works* are to be provided (including, without limitation, any planning permission).

(50) Statutory Undertaker means any governmental or local authority or statutory undertaker

- which has any jurisdiction with regard to the *works* including without limitation any jurisdiction to control development of the site or any part of it
- with whose requirements the *Employer* is required to comply or

with whose systems and/or utilities the *works* will be associated.

(51) TfL Group means Transport for London (“TfL”), a statutory body set up by the Greater London Authority Act 1999 and all of its subsidiaries and their subsidiaries (as defined in Section 1159 of the Companies Act 2006) from time to time, together with Cross London Rail Links Limited (company number 04212657) and reference to any “member of the TfL Group” refers to TfL or any such subsidiary.

(52) TfL Premises are any premises owned, leased or under the control of any member of the TfL Group.

(53) Transparency Commitment means the transparency commitment stipulated by the UK government in May 2010 (including any subsequent legislation) in accordance with which TfL is committed to publishing its contracts, tender documents and data from invoices received.

(54) The Workplace Policy is the *Employer’s* “Workplace Harassment Policy”, as updated from time to time, copies of which are available



on request from the *Employer*.”

Clause 12.2 Delete the current wording in clause 12.2 and replace with “This contract is governed by English law and the parties submit to the non-exclusive jurisdiction of the English Courts.”

Clause 12.4 Delete the existing wording and replace with

“12.4 This contract supersedes any previous agreement, arrangement or understanding between the *Employer* and the *Contractor* in relation to the matters dealt with in this contract and represents the entire understanding and agreement between the *Employer* and the *Contractor* in relation to such matters. The *Employer* and *Contractor* acknowledge and agree that each of them has not relied upon any prior representation by the other in entering into this contract.”

Clause 12.5 Insert a new clause:

“12.5 Any obligation imposed on either Party in this contract in the present tense is to be construed as an on-going obligation unless that obligation has been fulfilled.”

Clause 12.6 Insert a new clause:

“12.6 Save that any member of the TfL Group has the right to enforce the terms of this contract in accordance with the Contracts (Rights of Third Parties) Act 1999, the *Employer* and the *Contractor* do not intend that any of the terms of this contract are enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person not a Party. Notwithstanding the terms of this clause, the Parties are entitled to vary or rescind this contract without the consent of any or all members of the TfL Group (other than the *Employer*).”

Clause 12.7 Insert a new clause:

“12.7 “If any clause or part of this contract is found by any court, tribunal, administrative body or authority of competent jurisdiction to be illegal, invalid or unenforceable then that provision will, to the extent required, be severed from this contract and will be ineffective without, as far as is possible, modifying any other clause or part of this contract and this will not affect any other provisions of this contract which will remain in full force and effect. In the event that in the *Employer’s* reasonable opinion such a provision is so



fundamental as to prevent the accomplishment of the purpose of this contract, the *Employer* and the *Contractor* immediately commence good faith negotiations to remedy such invalidity.”

Clause 12.8 Insert a new clause:

“12.8 The headings to the sections, clauses and sub-clauses of these *conditions of contract* are for convenience only and do not affect their construction or interpretation.”

Clause 12.9 Insert a new clause:

“12.9 A reference in these *conditions of contract* to any applicable law or Statutory Requirement includes

- that law or Statutory Requirement as from time to time amended, re-enacted or substituted and
- any orders, rules, regulations, schemes, warrants, bye-laws, directives or codes of practice raised under any such law or Statutory Requirement.”

Clause 12.10 Insert a new clause:

“12.10 Notwithstanding the Contract Date, the conditions of this contract cover all work carried out by the *Contractor* from the date when he first commenced performance of the *works* and this contract and the warranties and undertakings in this contract are deemed to apply to all work performed by the *Contractor* both before and after the Contract Date.”

Clause 12.11 Insert a new clause:

“12.11 Failure by the *Employer* to exercise his rights under this contract does not constitute waiver of those rights nor any of them nor does any such failure relieve the *Contractor* from any of his obligations under this contract. The waiver in one instance of any right, condition or requirement does not constitute a continuing or general waiver of that or any other right, condition or requirement.”

[Clause 13.1 In line 3 after “recorded” insert “or is available for access on a nominated hosted web server and/or nominated file transfer platform as set out in the Works Information (save in the case of the notification of a dispute which shall be notified in hard copy only)”.



- Clause 13.2 At the end insert: "Alternatively, an electronic communication has effect when it is posted on a nominated hosted web service and/or nominated file transfer platform as set out in the Works Information. Communications relating to the notification of a dispute shall have no effect under this contract unless served in hard copy."]
- Clause 13.3 At the end insert:
- "Where the *period for reply* includes Christmas Day, Good Friday or a day under which the Banking and Financial Dealings Act 1971 is a Bank Holiday in England and Wales, that day is excluded for the purpose of calculating the period."
- Clause 14.1 Delete and substitute:
- "14.1 No acceptance, approvals, comments, instructions, consents or advice or indication of satisfaction given by or from the *Employer*, the *Project Manager* or the *Supervisor*, nor any enquiry or inspection which the *Employer*, the *Project Manager* or the *Supervisor* makes or has carried out for its benefit or on its behalf at any time, operates to reduce, extinguish, exclude, limit or modify the *Contractor's* duties and obligations under this contract unless it is in writing from the *Employer*, refers to this contract and clearly identifies the duty or obligation and the extent to which such duty or obligation is to be reduced, extinguished, excluded, limited or modified."
- Clause 16.2 Delete "Either the *Project Manager* or the *Contractor* may instruct the other" and substitute "*The Project Manager* may instruct the *Contractor* or the *Contractor* may request the *Project Manager* (such request not to be unreasonably refused)".
- Clause 16.4 Add at the end of the clause:
- "For the avoidance of doubt, revisions to the Risk Register do not give rise to a compensation event and merely reflect the decisions reached at the risk reduction meeting. The *Contractor's* only entitlement to a change in the Prices, the Completion Date or a Key Date as a result of any revision to the Risk Register is in accordance with clauses 60 to 65".
- Clause 17.2 Insert a new clause:
- "17.2 There is no addition to the Prices, any change to any Key Date or the Completion Date arising from any such ambiguity or



inconsistency where the *Project Manager* decides that the ambiguity or inconsistency in question is one arising from a document which the *Contractor* prepared or is responsible for. The *Project Manager* notifies the *Contractor* of this decision."

Clause 17.3 Insert a new clause:

"17.3 Where there is a discrepancy or conflict between or within the documents forming this contract, the provisions of the *conditions of contract* prevail over all other documents and the Z clauses prevail over all other parts of the *conditions of contract*."

Clause 17.4 Insert a new clause:

"17.4 The *Contractor* accepts entire responsibility for the *Contractor's* design and for any mistake, inaccuracy, discrepancy or omission contained in the same".

[Clause 17.5 Insert a new clause:

"17.5 The *Contractor* shall be deemed to have verified the accuracy of any information provided by the *Employer*, the *Project Manager* and/or the *Supervisor*]."

Clause 18.1 After "impossible" insert "or to carry out works which if completed in accordance with this contract will result in the *works* not being in accordance with the Statutory Requirements".

Clause 19.1 Insert after "and which" in the second paragraph:

"is not

- a shortage of staff whether caused by local market fluctuations or otherwise
- an event of Insolvency of the *Contractor* or any Subcontractor, Indirect Subcontractor or supplier or
- an event attributable to any negligence, omission or default of the *Contractor* or any of his employees or agents or any Subcontractor or Indirect Subcontractor or any of their employees or agents

and which"



and after the fourth bullet point insert:

“and

- the *Contractor* can demonstrate that he did not allow for it in his tender then this is a “Prevention Event” and”

Clause 20.1 At the end insert: “and the Statutory Requirements, and the *Contractor* ensures that the *works* will, when completed, comply with the Works Information and satisfy any requirement identified in the Works Information and this contract.”

Clause 20.6 Insert a new clause:

“20.6 The *Contractor* warrants and undertakes to the *Employer* as a condition of this contract that

- he has examined the Works Information and all other documents forming this contract and is not aware of any ambiguity or discrepancy within or between any of the contract documents which might adversely affect the carrying out of his work in accordance with this contract,
- he has all the resources including financial, technical and human resources as are required to carry out and complete his work in accordance with this contract,
- his work and those parts of the *works* for which the *Contractor* is responsible will be designed and specified using the best modern engineering principles and practices at the time of preparing the design and in accordance with good industry practice, and
- the proceeds of a claim made in connection with this contract under insurance taken out by the *Contractor* pursuant to clause 81 of the *conditions of contract* will be used solely for the purposes of the *works* and for no other purpose.”

Clause 21.1 Insert at the end of the clause: “The *Contractor* integrates and coordinates his design (if any) with the designs of Others and in accordance with the Works Information and the instructions of the *Project Manager*.”



- Clause 21.2 Delete the second sentence and replace with "Reasons for not accepting the *Contractor's* design are that
- it does not comply with the Works Information, applicable law or Statutory Requirements,
 - it is not integrated and coordinated with the designs of Others where the *Contractor* is required by the Works Information or the instructions of the *Employer* to integrate and/or coordinate his design with the designs of Others or such integration is necessary for the *Contractor* to Provide the Works,
 - it does not comply with this contract."
- Clause 21.4 Insert new clauses:
- "21.4 (1) The *Contractor* warrants to the *Employer* that insofar as it is responsible for the design of the *works*, it has exercised and exercises in the design of the *works* reasonable skill, care and diligence as may be expected of a properly qualified designer of the appropriate discipline(s) for such design, experienced in carrying out works of a similar scope, nature, timescale and complexity and on a similar site or at a similar location to the *works*
- (2) The *Contractor* warrants to the *Employer* that it uses the reasonable skill, care and diligence set out in clause 21.4(1) to see that the *works* comply with any performance specification or requirement included or referred to in the Works Information or the *Contractor's* design (including any changes to the Works Information) and comply with all Statutory Requirements. The *Contractor* warrants that any part of the *works* designed by the *Contractor* will interface and integrate fully with any design prepared by, or on behalf, of the *Employer*.
- 21.5 (1) Subject to the Works Information and any changes to it the *Contractor* warrants that to the extent the *Contractor* either is obliged to specify or approve products or materials for use in the *works* or does so specify or approve, the *Contractor* does not specify, approve or use any products or materials which are generally known within the construction industry to be deleterious at the time of use in the



particular circumstances in which they are used, or those identified as potentially hazardous in or not in conformity with

- (a) the report entitled "Good Practice in the Selection of Construction Materials" (1997, by Tony Sheehan, Ove Arup & Partners, published by the British Council for Offices and the British Property Federation) other than the recommendations for good practice contained in Section 2 of that report,
 - (b) relevant British or European Standards or Codes of Practice, or
 - (c) any publications of the Building Research Establishment related to the specification of products or materials.
- (2) If in the performance of its duties under this contract, the *Contractor* becomes aware that he or any other person has specified or used, or authorised or approved the specification or use by others of, any such products or materials, the *Contractor* notifies the *Project Manager* in writing immediately. This clause does not create any additional duty for the *Contractor* to inspect or check the work of others which is not required by this contract."

Clause 21.6 Insert a new clause:

"21.6 [The *Contractor* obtains from and/or gives to Others all licences, consents, notices and approvals necessary or appropriate to enable him to Provide the Works other than those which the Works Information states will be obtained or given by the *Employer* or Others.] The *Contractor* ensures that, prior to Completion and wherever necessary during the course of the *works*, the conditions and requirements of the licences, consents, notices and approvals, whether obtained by the *Contractor* or the *Employer*, are complied with and that the same are renewed whenever necessary or appropriate."

Clause 22 Delete and replace with:



- 22 **Intellectual Property Rights**
- 22.1 The parties agree that the IPR in all documents, drawings, materials, computer, any other material or works prepared or developed by or on behalf of the *Contractor* in the performance of this contract (including IPR in materials or works created by a Subcontractor or Indirect Subcontractor) vests in the *Employer*. The *Contractor* procures that each Subcontractor and Indirect Subcontractor assigns such IPR to the *Employer*.
- 22.2 In respect of Background IPR, the *Contractor* grants (in respect of his own Background IPR) and procures the grant of (in respect of a Subcontractor or Indirect Subcontractor's Background IPR) a non-exclusive, perpetual, irrevocable, royalty free licence (including the right to sub-licence) to the *Employer* and any novated *Employer* to use the Background IPR for all purposes, including (without limitation) for the purposes of
- understanding the *works*,
 - completing, operating, maintaining, repairing, modifying, altering, enhancing, re-figuring, correcting and replacing the *works*,
 - extending, interfacing with, integrating with, connection into and adjusting the *works* and/or the works of Others, and
 - enabling London Underground Limited to carry out the operation, maintenance, repair, renewal and enhancement of the "London Underground" network (where applicable).
- 22.3 The *Contractor* warrants and undertakes that he has the right to grant the *Employer* a licence to use the *Contractor's* Background IPR for all purposes, including (without limitation) for the purposes listed in clause 22.2.
- 22.4 The *Contractor* indemnifies the *Employer* and members of the TfL Group against all losses arising out of any use by the *Employer* of the Background IPR, including, without limitation, any claim that the exploitation of the licence granted by the *Contractor* under clause 22.2 infringes the intellectual property rights or other rights of any third party.
- 22.5 The *Contractor* shall have no right (save where expressly permitted



under this contract or with the *Employer's* prior written consent) to use any trade marks, trade names, logos or other intellectual property rights of the *Employer*.

- 22.6 Not Used.
- 22.7 IPR in all items supplied and owned by the TfL Group to the *Contractor* remains the property of the TfL Group.
- 22.8 The *Employer* grants to the *Contractor* a non-exclusive, non-transferable, revocable licence to use all IPR owned (or capable of being so licensed) by the *Employer* and required by the *Contractor* in order to Provide the Works. Any such licence is granted for the duration of this contract solely to enable the *Contractor* to comply with its obligations under this contract.
- 22.9 The *Contractor* promptly notifies the *Employer* upon becoming aware of an infringement, alleged infringement or potential infringement of any IPR (including any claims and demands relating to the same) which affects or may affect the provision of the *works*.
- 22.10 Subject to the *Employer's* proper observance of its obligations under this contract, the *Contractor* indemnifies the *Employer* against all actions, claims, demands, costs, damages, charges or expenses (including legal costs on a full indemnity basis) that arise from or are incurred by reason of any infringement or alleged infringement of any IPR.
- 22.11 The *Employer*, at the request of the *Contractor*, gives the *Contractor* all reasonable assistance for the purpose of contesting any such claim, demand or action. The *Contractor* reimburses the *Employer* for all costs and expenses (including legal costs) incurred in doing so and/or the *Contractor* shall conduct any litigation and all negotiations at its own expense arising from such claim, demand or action. The *Contractor* consults with the *Employer* in respect of the conduct of any claim, demand or action and keeps the *Employer* regularly and fully informed as to the progress of such claim, demand or action."
- Clause 23.1 Insert an additional bullet point between the first and second bullet points:
- "• this contract"



- [Clause 24.1 Add at the end of the clause:
- “The *Contractor* does not remove any key person from the contract for more than twenty one (21) consecutive days without the prior written consent of the *Project Manager*, save where such key person is absent on sick leave, or other statutory leave (such as jury service/maternity/paternity or adoption leave) or has left the *Contractor’s* employment”.]
- Clause 24.2 In the first sentence delete “an employee” and replace with “any person under the control of the *Contractor*.”
- In the second sentence delete “the employee” and replace with “such person”.
- Clause 26.3 Insert a further bullet point after the bullet “they do ... co-operation”:
- “ • in the opinion of the *Project Manager* they are not consistent with the terms of this contract”.
- Clause 26.5 Insert a new clause:
- “26.5 Where the *Contractor* has proposed a Subcontractor in Contract Data Part Two for part of the *works*, acceptance of Contract Data Part Two by the *Employer* without qualification of such proposal is deemed to be a consent on the same legal basis as consent by the *Project Manager* under clause 26.2, provided that the *Contractor* has complied with clause 26.3. Any such Subcontractor is not removed by the *Contractor* from the part of the *works* for which he has been proposed without the prior written consent of the *Project Manager*.”
- Clause 26.6 Insert a new clause:
- “26.6 Neither the objection to nor any failure to raise an objection to a proposed Subcontractor either by or through the *Project Manager* relieves the *Contractor* of any liability or obligation under this contract.”
- Clause 26.7 Insert a new clause:
- “26.7 On or before the *starting date* the *Contractor* notifies the *Employer* of the name, contact details and details of the legal representatives of each Subcontractor and Indirect Subcontractor, to the extent that such information has not already been provided by the *Contractor* to

the *Employer* under this contract.”

Clause 26.8 Insert a new clause

“26.8 The *Contractor* promptly notifies the *Employer* of any change to the information notified under clause 26.7 and provides the name, contact details and details of the legal representatives of any Subcontractor or Indirect Subcontractor who is engaged after the *starting date*.”

Clause 26.9 Insert a new clause

“26.9 The Contractor shall ensure that each subcontract with a Subcontractor or between a Subcontractor and an Indirect Subcontractor complies with regulation 113 of the Public Contracts Regulations 2015.”

Clause 27.5 Insert a new clause:

“27.5 The terms and conditions of this contract and the warranties and undertakings which it contains apply to all *works* performed and to be performed by the *Contractor* in relation to the project to which the *works* relate both before and after the Contract Date.”

Clause 27.6 Insert a new clause:

“27.6 “The *Employer* may assign the benefit of and its rights under this contract without the consent of the *Contractor* being required. The *Contractor* shall not assign the benefit of and its rights under this contract without the prior written consent of the *Employer*”.

Clause 27.7 Insert a new clause:

- “27.7
- (1) The *Contractor* takes full responsibility for the adequacy stability and safety of all site operations and methods of construction and complies fully with the requirements of the CDM Regulations.
 - (2) The Contractor warrants that it is fully conversant with the guidance and any codes of practice published by the Health and Safety Executive in relation to the CDM Regulations.
 - (3) The *Contractor* throughout the progress of the *works* and while the *Contractor* has access to the Site in accordance with this contract has full regard for the safety of all persons



entitled to be upon the Site and keeps the Site (so far as the same is under his control) and the *works* (so far as the same have not been handed over to or occupied by the *Employer*) in an orderly state appropriate to the avoidance of danger to such persons and, without limitation, in connection with the *works*, provides and maintains at his own cost all lights guards fencing warning signs and watching when and where necessary or where required by any competent statutory or other authority for the protection of the *works* or for the safety and convenience of the public or Others.

- (4) Where the *Contractor* is the *Principal Contractor* and/or the *Principal Designer*, the *Contractor* performs all the functions and duties of and exercises the powers of the "principal contractor" and/or the "principal designer" as defined in the CDM Regulations.
- (5) Where the *Contractor* is not the *Principal Contractor* and/or the *Principal Designer*, the *Contractor* performs all the functions and duties of a "contractor" and (where the *Contractor* is responsible for design) a "designer" as defined in the CDM Regulations.
- (6) The *Contractor* warrants to the *Employer* that it has the skills, knowledge, experience, organisational capability and level of resources necessary to meet the requirements of the CDM Regulations and to fulfil the role of "principal contractor", "principal designer", "contractor" and "designer" (as applicable) as defined in the CDM Regulations.
- (7) The *Contractor* at all times co-operates, so far as is reasonably practicable, with all parties having health and safety responsibilities on or adjacent to the Site, including the *Principal Contractor* and the *Principal Designer* (where these roles are not being performed by the *Contractor*) for the effective discharge of those responsibilities.
- (8) The *Contractor* shall procure that each Subcontractor and Indirect Subcontractor complies fully with the requirements of the CDM Regulations.



- (9) Before the commencement of work on Site the *Contractor* provides the *Project Manager* with a copy of his Statement of Health and Safety Policy, and that of any Subcontractor prior to such Subcontractor commencing work on the Site.
- (10) The *Contractor* to the extent that he is in control of the Site or any part of it within the meaning of Section 4 of the Health and Safety at Work etc. Act 1974 keeps the Site, its access and egress, safe and without risk to the health of persons using it."

Clause 27.8

Insert a new clause:

"27.8

The *Contractor* acknowledges that the *Employer* is under a duty under Section 17 of the Crime and Disorder Act, 1998 to

- have due regard to the impact of crime, disorder and community safety in the exercise of the *Employer's* duties,
- where appropriate, identify actions to reduce levels of crime and disorder and
- without prejudice to any other obligation imposed on the *Employer*, exercise its functions with due regard to the likely effect of the exercise of those functions on, and the need to do all that it reasonably can to prevent, crime and disorder in its area

and in the performance of this contract, the *Contractor* assists and co-operates, and uses reasonable endeavours to procure that its Subcontractors and Indirect Subcontractors assist and co-operate, with the *Employer* where possible to enable the *Employer* to satisfy its duty."

[Clause 27.9

Insert a new clause:

"27.9

The *Contractor* shall be deemed to be fully acquainted with the physical conditions (including the sub-surface conditions) and other conditions of or affecting the Site of the *works* before the Contract Date and to have obtained all necessary information as to risks, contingencies and all other circumstances which may influence or affect the execution of the *works*. No failure on the part of the *Contractor* to discover or foresee any such condition, risk, contingency or circumstance entitles the *Contractor* to a



compensation event and/or any additional payment (whether by way of an addition to the Prices or otherwise) or to any change to the Completion Date and/or Key Dates. As between the *Contractor* and the *Employer*, the *Contractor* does not rely upon any survey, report or other document prepared by or on behalf of the *Employer* regarding any such matter as is referred to in this clause or as set out in the Works Information and/or Site Information and the *Employer* makes no representation or warranty as to the accuracy or completeness of any such survey, report or document. The *Employer* has no liability arising out of or in relation to any such survey, report or document or from any representation or statement, whether negligently or otherwise made, contained in such survey, report or other document.”]

Clause 27.11 Insert a new clause:

“27.11 If requested by the *Employer*, the *Contractor* enters into a novation agreement within the period for reply in the form of the novation agreement in the form attached or in such other format as the *Employer* may reasonably require in order to novate the benefit and burden of this contract to another member of the TfL Group.”

Clause 27.12 Insert a new clause:

“27.12 The *Contractor* gives notice to the *Employer* within 10 days where

- there is any change in ownership of the *Contractor* where such change relates to fifty percent (50%) or more of the issued share capital of the *Contractor*; and
- there is any change in ownership of the Holding Company where such change relates to fifty percent (50%) or more of the issued share capital of the Holding Company; and
- (in the case of an unincorporated *Contractor*) there is any change in the management personnel of the *Contractor*, which alone or taken with any other change in management personnel not previously notified to the *Employer*, equates to a change in the identity of fifty percent (50%) or more of the management personnel of the *Contractor*.”

Clause 30.4 Insert a new clause:

“30.4 The *Contractor* proceeds regularly and diligently to Provide the Works in accordance with this contract, and uses all reasonable endeavours to prevent and/or reduce any delay in the progress of

the works.”

Clause 31.2 In the sixth bullet point add “environmental and” before “health and safety requirements”.

[Clause 36.5 Insert new clause:

“36.5 If the *Contractor* does not submit a quotation within the *period for reply* or if the *Project Manager* decides that the *Contractor* has not assessed the quotation for an acceleration correctly then the *Project Manager* may instruct the *Contractor* to achieve Completion before the Completion Date. If the *Project Manager* instructs the *Contractor* to achieve Completion before the Completion Date the *Project Manager* assesses the change to the Prices, the Completion Date and the Key Dates and informs the *Contractor* of any changes.”]

Clause 45.3 Insert a new clause:

“45.3 For the avoidance of doubt, the *Contractor* continues to be liable for Defects (including Defects listed in the Defects Certificate and latent or inherent Defects) after

- the issue of the Defects Certificate
- the operation of this section 4 and
- the termination of this contract for any reason (including breach by the *Employer*)

in accordance with the *law of the contract*, subject to any time limit on claims and limitation on liability expressly provided by this contract”.

Clause 50.1A Insert a new clause:

“50.1A The *Contractor* submits an application for payment to the *Project Manager* in a form approved by the *Project Manager* not less than fourteen days prior to each assessment date. The application states the sum that the *Contractor* considers to be due to him at the payment due date and the basis on which that sum is calculated.”



Clause 50.4 In line two delete "on or before the assessment date" and substitute "in accordance with clause 50.1A".

Clause 50.8 Insert a new clause:

"50.8 All sums payable by or to the *Employer* or the *Contractor* are exclusive of Value Added Tax ("VAT"). Where VAT is chargeable on such sums, the payer pays, upon production of a valid VAT invoice by the payee, such VAT in addition to such sums."

Clause 50.9 Insert a new clause:

"50.9 (1) If a parent company guarantee has been required from the *Contractor* by the inclusion of optional clause X4 (parent company guarantee) then one quarter of the Price for Work Done to Date is retained in assessments of the amount due until the *Contractor* has provided the relevant guarantee in accordance with optional clause X4, and

(2) In addition or in the alternative if a performance bond has been required from the *Contractor* by the inclusion of optional clause X13 (performance bond) then one quarter of the Price for Work Done to Date is retained in assessments of the amount due until the *Contractor* has provided the relevant performance bond in accordance with optional clause X13, and

(3) the *Employer* shall pay any amount retained pursuant to clause 50.9 (1) and/or 50.9 (2) to the *Contractor* within 10 days of the provision to the *Employer* of the relevant guarantee or performance bond. The total amount retained by the *Employer* pursuant to this clause 50.9 shall not exceed half of the Price for Work Done to Date."

Clause 50.10 Insert a new clause:

"50.10 In addition to any other rights of the *Employer* whether at law or equity under this contract, whenever,

- under this contract or any other contract between the *Employer* and the *Contractor* any sum of money is recoverable from or payable by the *Contractor* or
- any damages, costs, charges, expenses, debts, sums or

other amounts are reasonably and properly owed to, or incurred by, the *Employer* or where any member of the TfL Group is the *Employer* only, any member of the TfL Group arising out of or attributable to this contract or any other contract between the *Employer* and the *Contractor*

(with the exception of indirect or consequential losses of the Employer) then the same may be deducted from any sum otherwise due or which at any time may otherwise become due to the *Contractor* under this contract."

Clause 51.1 Delete the first sentence and replace it with:

"The *Project Manager* certifies a payment within one week of each assessment date and issues a copy of the certificate to the *Contractor*."

Clause 51.1A Insert a new clause:

"51.1A As soon as reasonably practicable and in any event not later than five days of receipt of a certificate in accordance with clause 51.1 the *Contractor* issues a valid VAT invoice for the amount stated on the certificate. The *Contractor* issues invoices in the manner and format required by the Contract Data and/or the Works Information."

Clause 51.4 At the end of the clause add:

"The parties agree that the provisions in this contract for the payment of interest constitute a substantial remedy for late payment of any sum payable under this contract in accordance with section 8(2) of the Late Payment of Commercial Debts (Interest) Act 1998."

Clause 60.1 Amend as set out below:

[60.1(12) Delete.]

[60.1(13) Delete.]

[60.1(18) After "of contract by" insert "or act of prevention on the part of". After "*Employer*" insert "(except to the extent that it is caused or contributed to by the *Contractor* any Subcontractor or Indirect Subcontractor or any person for whom those parties are responsible)".]



- [60.1(19) Delete the existing wording and substitute:
- “(19) An event which is a Prevention Event and is not a breach of contract by the *Contractor* and is not one of the other compensation events stated in this contract provided that the *Contractor* is not entitled under this sub-clause 60.1(19) to any change to the Prices.”]
- [Clause 60.2 Delete.]
- [Clause 60.3 Delete.]
- Clause 61.3 In the second paragraph replace “becoming” with the words “when he becomes aware or ought reasonably to have become”.
- At the end of the second paragraph include the words “The *Employer* may, in his absolute discretion, assess a change to the Completion Date or a Key Date (but not a change to the Prices) in the absence of a notice from the *Contractor* in accordance with this sub-clause.”
- Clause 61.4 After “fault of the *Contractor*” insert in the first bullet point:
- “including, without limitation, any error, omission, negligence, default, breach of contract or breach of statutory duty of the *Contractor* or any of its employees or agents or of any Subcontractor Indirect Subcontractor or supplier or any of their employees or agents”.
- After “to submit quotations” at end of second sentence insert “including sufficient supporting information”.
- In the first bullet point in the third sentence replace “one week” with “two weeks”.
- Clause 61.7 At the end insert:
- “No change in Prices is made in respect of any compensation event notified after the *defects date*”.
- Clause 62.2 After “details of his assessment” in the second sentence include “including a detailed breakdown of any changes to the Prices and the measures to be taken in respect of Subcontractors and Indirect Subcontractors (where relevant) with regards to the *works* and any planned *works* by Others”.
- At the end of clause 62.2 include the following words:



"If the quotations comprise or include delays, the details of the *Contractor's* assessment include sufficient evidence to demonstrate that the compensation event has caused or (in the case of future delay) will cause delay to the Completion Date or a Key Date."

Clause 63.3 At the end of the second sentence insert:

"provided always that any delay is only assessed as giving rise to a change in the Completion Date or a Key Date if and to the extent

- that the compensation event is the sole or principal cause of the delay, and
- there is sufficient evidence to demonstrate that the compensation event has caused or (in the case of future delay) will cause delay to the Completion Date or a Key Date

For the avoidance of any doubt, the *Employer* may assess and fix an earlier Completion Date or Key Date if the effect of the compensation event is to reduce the time required for Completion or meeting a Key Date."

Clause 63.4 At the end of the clause delete the full stop and insert:

"and the *Employer* has no financial liability to the *Contractor* other than amounts claimable and recoverable under this contract."

Clause 63.6 After "event includes" insert the words "reasonable and proportionate".

Clause 63.7 At the end insert:

"Where the *Employer* decides that the *Contractor* has failed to act in accordance with the assumptions in this clause the failure is taken into account when making the assessment".

Clause 63.8 Insert after "ambiguity or inconsistency" the words "which (in accordance with sub-clauses 17.1 and 17.2) is a compensation event."

Clause 64.1 Insert at the end of the first bullet point "including a detailed breakdown of any changes to the Prices and the measures to be taken with regard to each Subcontractor and Indirect Subcontractor and with regard to the *works* and planned works by Others."

Clause 70.1 Delete and substitute:



"70.1 No payment is made to the *Contractor* on account of Plant and Materials which are outside the Working Areas unless immediately on payment and without any further act being necessary title passes to the *Employer* and the *Contractor* ensures that the Plant and Materials are clearly tagged, identified as the *Employer's* and set aside for the *Employer*. Risk in such Plant and Materials does not pass on payment."

Clause 70.2 At the end insert:

"Notwithstanding the first sentence of clause 70.2, title passes to the *Employer* on payment being made by the *Employer* to the *Contractor* for Plant and Materials outside the Working Area."

Clause 82.1 Add at the end of the clause after "Plant and Materials":

"and (when required) undertakes the removal and disposal of debris. The *Contractor* bears the cost of dismantling and replacing any Plant necessary to affect such replacements or repairs. The *Employer* in his sole and absolute discretion is entitled to decide not to replace and/or repair any loss and/or damage to the *works*, Plant & Materials."

Clause 83.1 Delete clause 83.1 and replace with the following new clause:

"83.1 The *Contractor* is responsible for and indemnifies the *Employer*, his employees and agents against all expenses, liabilities, losses, claims, proceedings, compensation and costs whatsoever ("Losses") incurred in respect of

- death or injury to any person,
- wilful default, fraud or fraudulent misrepresentation

to the extent that such Losses are due to any negligence, breach of contract, breach of statutory duty, error, act, omission, or default by the *Contractor*, his employees, Subcontractors, Indirect Subcontractors or agents or due to matters, circumstances or events



Clause 83.2 which are at the *Contractor's* risk. Notwithstanding any other provision, the Contractor's maximum aggregate liability in respect of all other losses under or in relation with this Contract shall in no event exceed an amount equal to the value of this Contract."

"83.2 Delete clause 83.2 and replace with the following new clause:

The *Contractor's* indemnity under sub-clause 83.1 remains in force for the duration of this contract and continues to survive the expiry or termination of the *Contractor's* appointment under this contract and/or the expiry or termination of this contract. Without prejudice to the survival of any other clauses or schedules, the clauses or schedules of this contract necessary to give effect to the *Contractor's* indemnity under clause 83.1 also survive expiry or termination of the *Contractor's* appointment under this contract and/or the expiry or termination of this contract.

Clause 83.3

"83.3 Add new clause 83.3 as follows:

The *Contractor* is not responsible for and does not indemnify the *Employer* for Losses to the extent that such Losses are caused by the negligence of the *Employer*, his employees or agents."

Clause 84.1

Delete "Insurance Table" and substitute with "Insurance Table set out in **Schedule 2**." Replace the reference to Contract Data in line two and in line 3 with "Insurance Table set out in **Schedule 2**."

At the end of the clause insert:

"Subject to clause 84.4, the insurances provide cover from the *starting date* until the Defects Certificate or a termination certificate has been issued, whichever is the later (or for such other period as stated in the Contract Data)."

Clause 84.2

Clause 84.3 Delete the "Insurance Table" in its entirety. Insert "not used".

"84.3 Insert a new clause as follows:

The insurance requirements under this contract do not relieve the *Contractor* from any of his other obligations and liabilities under this contract".

Clause 84.4

"84.4 Insert a new clause:

(1) The *Contractor*, at his own cost, takes out and maintains professional indemnity insurance with a limit of indemnity of not less than the sum stated in **Schedule 2** for any one occurrence or series of occurrences arising out of any one

event, in relation to the *works* provided always that

- such insurance is in place from the Contract Date until no less than twelve (12) years after Completion of the *works*
 - the insurance premiums in respect of the insurance are at all times the responsibility of the *Contractor* and
 - if such insurance ceases to be available to the *Contractor* (and/or design and build contractors engaged in services of a similar size, nature and complexity as the *Contractor*) at commercially reasonable rates and terms (such non availability to be confirmed by an independent insurance agent operating in the UK market), excluding any increase in premiums attributable to the actions, omissions, claims record, error or defaults of the *Contractor*, the *Contractor* immediately notifies the *Employer* and the *Contractor* and the *Employer* then meet and the *Contractor* outlines the steps he intends to take to manage such risks. If the steps proposed by the *Contractor* are not reasonably acceptable to the *Employer*, the parties shall agree an alternative method of managing such risk.
- (2) The *Contractor* carries out his obligations under this contract and ensures that his servants or agents carry out their respective obligations in such manner that all requirements, terms, conditions, stipulations and provisos of the insurance required by clause 84.4 (1) are at all times fully complied with”.

Clause 84.5 Insert a new clause:

“84.5 The *Contractor* provides insurance covering loss or damage to motor vehicles and liability to third parties arising out of the use of motor vehicles used in connection with the *works*. Such insurance shall contain an indemnity to principals clause. The minimum amount of cover/indemnity provided by such insurance shall be the replacement cost in respect of loss or damage and the amount required by the applicable law in respect of third party liability.”

Clause 84.6 Insert a new clause:

“84.6 The *Employer* provides the insurances set out in the Contract Data Part One to the extent such insurance is available at reasonable



commercial rates. Nothing in such insurance changes the allocation of risks to the *Contractor* and the *Employer* as set out in clause 80 and clause 81.”

Clause 85.5

Insert a new clause:

“85.5

In relation to all claims made under insurances obtained by the *Employer* (as set out in the Contract Data Part One) the following provisions apply.

- (1) Unless the *Employer* otherwise decides, the *Contractor* authorises the *Employer* to submit all claims and the *Employer* submits and administers all claims.
- (2) Without prejudice to any other right, remedy or power of the *Employer*, the *Contractor* must provide such information, documents and records in connection with such claims as the *Employer* requires forthwith on demand, regardless of whether the *Employer* is submitting or administering the claim.
- (3) Without prejudice to any other right, remedy or power of the *Employer*, the *Contractor* authorises insurers to pay monies under the insurances to the *Employer*.
- (4) The *Employer*, after receipt of monies paid under the insurances, allocates and pays to each party insured that portion of the monies received for the purpose of rectifying the loss that each party insured has suffered. [The deductible is borne pro rata by each such party.] [The *Contractor* bears the cost of all deductibles].
- (5) [If the premiums payable by the *Employer* increase due to or as a result of claims caused by the *Contractor* arising from events within the control of the *Contractor* (including claims attributable to its Subcontractors and/or Indirect Subcontractors) then the *Contractor* shall pay to the *Employer* the increase in premium].”

Clause 85.6

Insert a new clause:

“85.6

The *Contractor* effects any insurances which it is required to provide under this contract promptly with a reputable insurer or insurers accepted by the *Project Manager* and authorised to underwrite such



risks in the United Kingdom.”

Clause 85.7 Insert a new clause:

“85.7 The *Contractor* promptly notifies the *Project Manager* in writing of any claim, event, fact, matter or circumstance which may give rise to the right to make any claim on any insurance.”

Clause 85.8 Insert a new clause:

“85.8 The *Contractor* does not compromise, surrender, release, settle or waive any claim or potential claim which the *Contractor* has or may have the right to bring, or has brought, under any insurance without the prior consent of the *Project Manager*.”

Clause 85.9 Insert a new clause:

“85.9 The *Contractor* does not by any act or omission exclude, limit, reduce, vitiate, prejudice, lose or forgo any of the *Contractor’s* and/or the *Employer’s* rights to make or proceed with a claim against any insurer.”

Clause 85.10 Insert a new clause:

“85.10 If the *Contractor* is informed that any insurer providing insurance required by this contract intends to cancel or change any term of any insurance required by this contract, the *Contractor* promptly notifies the *Project Manager* of such intention.”

Clause 85.11 Insert a new clause:

“85.11 The *Contractor* promptly notifies the *Project Manager* in writing of any anticipated or actual event or circumstance which may lead or has led to any insurance required by this contract lapsing or being terminated or the cover under it being reduced or modified.”

Clause 85.12 Insert a new clause:

“85.12 To the extent that the *Contractor* is entitled to bring any claim or claims under any insurance relating to this contract then the *Contractor* deals with all such claims promptly and diligently and (subject to the requirements of this contract) in accordance with all insurer requirements and recommendations.”

Clause 85.13 Insert a new clause:



- "85.13 The *Contractor* acknowledges that the *Employer* has the right to control and to supervise all dealings with the press, television, reporters, and any other media in relation to any incident, event, claim or action arising in connection with this contract."
- Clause 85.14 Insert a new clause:
- "85.14 If and to the extent that the *Contractor* receives payment in respect of any damage or destruction following an insurance claim in respect of damage or destruction of the *works* the *Contractor* shall apply the same to remedy the damage or destruction."
- Clause 90.2 In the "Termination Table" in the *Employer's* "Reason" column, after "R1-R15 or R18" add "or R22".
- Clause 91.1 In R7 add after "amalgamate or reconstruct" the words "without insolvency".
- Clause 91.2 Add a new paragraph at the end of the clause:
- "The *Employer* may also terminate if the *Project Manager* notifies that the *Contractor* has defaulted in one of the ways listed at R11-R13 on [two] occasions within a period of [eight (8) weeks] whether or not the *Contractor* has remedied the default within four (4) weeks of the [second] notification by the *Project Manager*."
- Clause 91.4 Add at the start of the clause: "Save when the *Employer* has complied with Option Y (UK) 2 clause Y2.3,"
- Add at the end of the clause: "provided always that the *Contractor* has given written notification to the *Employer* of such intention to terminate at least five (5) weeks prior to any such termination and the *Employer* has not paid the amount due within that period."
- Clause 91.6 Add at the start of the second bullet point: "providing the *Contractor* has given written notification to the *Employer* of an intention to terminate at least five (5) weeks prior to such termination and no instruction allowing the *works* to restart or start has been given within that period."
- Add at the start of the third bullet point: "providing written notification of an intention to terminate is given to the other Party at least four (4) weeks prior to such termination and no instruction allowing the *works* to restart or start has been given within that

period.”

- Clause 91.7 In the fourth bullet point after “experienced” insert “and prudent contractor familiar with works similar to the *works* and exercising the foresight appropriate to such a”
- Clause 91.8 Add a new clause:
- “91.8 The *Employer* may terminate the contract if the *Contractor* is in breach of clause Z8 (Conflict of Interest) and/or clause Z11 (Corrupt Gifts and Payments) and/or clauses Z19 (Equality and Diversity compliance) [and/or clause Z24 (Equality and Diversity)] [and/or clause Z25 (SLNT)] , or if any of the events referred to at clause 27.12 occur (regardless of whether or not the notice required by clause 27.12 is given by the *Contractor*) (R22)”.
- Clause 92.1 Add a new sentence at the end of the clause “The *Contractor* makes available to the *Employer* within seven (7) days all information prepared in relation to the works in either electronic or documentary form including all drawings, specifications, reports and any other information held in an agreed format”.
- Clause 92.2 In procedure P2 after “assign the benefit of” insert “and/or enter into a novation of (in such format as the *Employer* may reasonably require)”.
- Clause 94 Insert a new clause:
- “94 **Ineffectiveness and cessation**
- 94.1 Without prejudice to the *Employer’s* right to terminate the *Contractor’s* obligation to Provide the Works under clauses 90 to 93 or at common law, the *Employer* may terminate the *Contractor’s* obligations to Provide the Works at any time following a Declaration of Ineffectiveness in accordance with the provisions of this clause 94.
- 94.2 In the event that a court makes a Declaration of Ineffectiveness, the *Employer* promptly notifies the *Contractor*. The Parties agree that the provisions of clause 94 shall apply as from the date of receipt by the *Contractor* of the notification of Declaration of Ineffectiveness. Where there is any conflict or discrepancy between the provisions of clauses 90 to 93 and this clause 94 or the Cessation Plan, the provisions of this clause 94 and the Cessation Plan prevail.
- 94.3 The Declaration of Ineffectiveness does not prejudice or affect any right, liability or remedy which has accrued or accrues to either Party

prior to or after such Declaration of Ineffectiveness.

- 94.4 As from the date of receipt by the *Contractor* of the notification of the Declaration of Ineffectiveness, the Parties (acting reasonably and in good faith) agree or, in the absence of such agreement, the *Employer* reasonably determines an appropriate Cessation Plan with the object of achieving
- an orderly and efficient cessation of the *works* or (at the *Employer's* request) a transition of the *works* to the *Employer* or such other entity as the *Employer* may specify, and
 - minimal disruption or inconvenience to the *Employer* or to public passenger transport services or facilities, in accordance with the provisions of this clause 94 and to give effect to the terms of the Declaration of Ineffectiveness.
- 94.5 Upon agreement, or determination by the *Employer*, of the Cessation Plan the Parties comply with their respective obligations under the Cessation Plan.
- 94.6 The *Employer* pays the *Contractor's* reasonable costs in assisting the *Employer* in preparing, agreeing and complying with the Cessation Plan. Such costs are based on any comparable costs or charges agreed as part of this contract or as otherwise reasonably determined by the *Employer*. Provided that the *Employer* is not liable to the *Contractor* for any loss of profit, revenue goodwill or loss of opportunity as a result of the early termination of the *Contractor's* obligation to Provide the Works pursuant to this clause 94."
- Clause 95 Insert a new clause 95
- "95 For the purpose of this clause 95, Public Procurement Termination Event shall mean if a court determines that one or more of the circumstances described in regulation 73(1) of the Public Contracts Regulations 2015 has occurred.
- 95.1 Without prejudice to the *Employer's* right to terminate the *Contractor's* obligation to Provide the Works under clauses 90 to 94 or at common law and the *Employer's* rights of termination implied into this contract by regulation 73(3) of the Public Contracts Regulations 2015, in the event of a Public Procurement Termination Event, the *Employer* shall promptly notify the *Contractor* and the Parties agree



that the provisions of clauses 90 to 93 and this clause 95 shall apply as from the date of receipt by the *Contractor* of the notification of the Public Procurement Termination Event. If there is any conflict or discrepancy between the provisions of clauses 90 to 93 and this clause 95 or the Cessation Plan, the provisions of this clause 95 and the Cessation Plan shall prevail.

95.2 The Public Procurement Termination Event shall not prejudice or affect any right, liability or remedy which has accrued or shall accrue to either Party prior to or after such Public Procurement Termination Event.

95.3 As from the date of receipt by the *Contractor* of the notification of the Public Procurement Termination Event, the Parties (acting reasonably and in good faith) shall agree or, in the absence of such agreement, the *Employer* shall reasonably determine, an appropriate Cessation Plan with the object of achieving:

- an orderly and efficient cessation or (at the *Employer's* election) a transition to the *Employer* or such other entity as the *Employer* may specify of: (i) the *works*; or (at *Employer's* election), (ii) the part of the *works* which are affected by the Public Procurement Termination Event; and
- minimal disruption or inconvenience to the *Employer* or to public passenger transport services or facilities,

in accordance with the provisions of this clause 95 and to give effect to the terms of the Public Procurement Termination Event.

95.4 Upon agreement, or determination by the *Employer*, of the Cessation Plan, the Parties comply with their respective obligations under the Cessation Plan.

95.5 The *Employer* pays the *Contractor's* reasonable costs in assisting the *Employer* in preparing, agreeing and complying with the Cessation Plan. Such costs are based on any comparable costs or charges agreed as part of this contract or as otherwise reasonably determined by the *Employer*, provided that the *Employer* is not liable to the *Contractor* for any loss of profit, revenue goodwill or loss of opportunity as a result of the early termination of the *Contractor's* obligation to Provide the Works pursuant to this clause 95."



Dispute Resolution

Option W2 Delete option W2 and replace with:

- “W2.1
- The Parties follow the procedure below for the avoidance and resolution of any Dispute arising under or in connection with this contract.
 - In this clause, time periods stated in days exclude Christmas Day, Good Friday and bank holidays.
 - A Party may refer a Dispute to the *Adjudicator* at any time by way of a Notice of Adjudication. Subject to that, by notice in writing, a Party may refer a Dispute to the Parties’ Senior Representatives for consideration. The written notice identifies the Party’s Senior Representative, gives brief written particulars of the Dispute, including the provisions of this contract that are relevant to the Dispute, the relief sought and the basis for claiming the relief sought.
 - Within fourteen (14) days of receipt of the notice of referral to Senior Representatives, the responding party provides the referring party with a brief written response and identifies the responding party’s Senior Representative.
 - Within a further fourteen (14) days the Senior Representatives meet and try to reach agreement to resolve the Dispute. Each Party bears its own costs and expenses in relation to any reference of a Dispute to the Senior Representatives. Any documents prepared or exchanged in relation to the reference of the Dispute to Senior Representatives and any discussions between the Senior Representatives are without prejudice and the Parties do not make use of or rely upon any without prejudice statements in any subsequent Dispute proceedings.
- W2.2
- The Parties appoint the *Adjudicator*.
 - The *Adjudicator* acts impartially and decides the Dispute as an independent adjudicator and not as an arbitrator.
 - The Parties may choose an adjudicator (or replacement adjudicator, as necessary) jointly or a Party may ask the *Adjudicator nominating body* to choose an adjudicator. Such



joint appointment or referral to the *Adjudicator nominating body* shall take place immediately upon the serving of a Notice of Adjudication, or immediately following the position of *Adjudicator* falling vacant.

- The *Adjudicator nominating body* chooses an adjudicator within four (4) days of the request. The chosen adjudicator becomes the *Adjudicator*.
- A replacement *Adjudicator* has the power to decide a Dispute referred to his predecessor but not decided at the time when his predecessor resigned or became unable to act. He deals with an undecided Dispute as if it had been referred to him on the date he was appointed.
- The *Adjudicator*, his employees and agents are not liable to the Parties for any action or failure to take action in an adjudication unless the action or failure to take action was in bad faith.

W2.3

- Before a Party refers a Dispute to the *Adjudicator*, he gives a Notice of Adjudication to the other Party with a brief description of the Dispute, including the provisions of this contract that are relevant to the Dispute, the relief sought, the basis for claiming the relief sought and the decision that he wishes the *Adjudicator* to make. Following the appointment of the *Adjudicator*, the Party immediately sends a copy of the Notice of Adjudication to the *Adjudicator*. Within three (3) days of the receipt of the Notice of Adjudication, the *Adjudicator* notifies the Parties
 - that he is able to decide the Dispute in accordance with the contract or
 - that he is unable to decide the Dispute and has resigned.

If the *Adjudicator* does not so notify within three (3) days of the issue of the Notice of Adjudication, either Party may act as if he has resigned.

- Within seven (7) days of a Party giving a Notice of Adjudication he
 - refers the Dispute to the Adjudicator,



- provides the *Adjudicator* with the information on which he relies, including the factual and contractual or other basis of the claim, the amount (if any) claimed and any supporting documents, and
- provides a copy of the information and supporting documents he has provided to the *Adjudicator* to the other Party.

Upon receipt of the Referral Notice, the *Adjudicator* must inform every Party to the Dispute of the date that it was received. Within fourteen (14) days from the referral, any Party, who is not the Party giving a Notice of Adjudication, provides the *Adjudicator* with the information on which he relies, including the factual and contractual or other basis of the claim, the amount (if any) claimed and any supporting documents.

These periods may be extended if the *Adjudicator* and Parties agree.

- If a matter disputed by the *Contractor* under or in connection with a subcontract is also a matter disputed under or in connection with this contract the *Contractor* may, with the consent of the Subcontractor and *Employer*, refer the subcontract dispute to the *Adjudicator* at the same time as the main contract referral. The *Adjudicator* then decides the disputes together and references to the Parties for the purposes of the dispute are interpreted as including the Subcontractor. The Parties comply with any reasonable request by the *Adjudicator* for more time to decide the disputes referred to him.

If this contract is a subcontract and the main contract provides for joint adjudication of disputes, the following procedure applies.

Within two (2) weeks of the notification of the dispute by the *Contractor* to the *Employer*, the *Employer* notifies the *Contractor* if the matter disputed is a matter disputed under or in connection with the main contract.

The *Employer* may then



- submit the subcontract dispute to the main contract adjudicator at the same time as the main contract submission and
- instruct the *Contractor* to provide any information which the *Employer* may require.

The main contract adjudicator then gives his decision on the disputes together.

- The *Adjudicator* may
 - make directions for the conduct of the Dispute
 - review and revise any action or inaction of the *Employer* related to the Dispute and alter a quotation which has been treated as having been accepted
 - take the initiative in ascertaining the facts and the law related to the Dispute
 - instruct a Party to provide further information related to the Dispute within a stated time and
 - instruct a Party to take any other action which he considers necessary to reach his decision and to do so within a stated time.
- If a Party does not comply with any instruction within the time stated by the *Adjudicator*, the *Adjudicator* may continue the adjudication and make his decision based upon the information and evidence he has received.
- The *Adjudicator* shall consider any relevant information submitted to him by any of the Parties and shall make available to them any information to be taken into account in reaching a decision.
- A communication between a Party and the *Adjudicator* is communicated to the other Party at the same time.
- Save as required by law, the Parties and the *Adjudicator* keep information relating to the Dispute confidential.
- If the *Adjudicator's* decision includes assessment of additional



cost or delay caused to the *Contractor*, he makes his assessment in the same way as a compensation event is assessed.

- The *Adjudicator* decides the Dispute and notifies the Parties of his decision and his reasons within twenty-eight (28) days of the Dispute being referred to him. This period may be extended by up to fourteen (14) days with the consent of the Parties or by any other period agreed by the Parties.
- After the giving of a Notice of Adjudication, the Parties may seek to agree how the *Adjudicator* allocates the costs and expenses of the adjudication, excluding the *Adjudicator's* own remuneration and expenses, as between the Parties.
- Subject to any agreement of the Parties, the *Adjudicator* allocates payment of his own remuneration and expenses as between the Parties.
- Unless and until the *Adjudicator* has notified the Parties of his decision the Parties proceed as if the matter disputed was not disputed.
- If the *Adjudicator* does not make his decision and notify it to the Parties within the time provided by this contract the Parties and the *Adjudicator* may agree to extend the period for making his decision. If they do not agree to an extension, either Party may act as if the *Adjudicator* has resigned.
- The *Adjudicator's* decision is binding on the Parties unless and until revised by the courts pursuant to any legal proceedings and is enforceable as a matter of contractual obligation between the Parties and not as an arbitral award. The *Adjudicator's* decision is final and binding if neither Party has notified the other within the time required by this contract that he is dissatisfied with a matter decided by the *Adjudicator* and intends to refer the matter to the courts.
- The *Adjudicator* may on his own initiative or on the application of a Party correct his decision so as to remove a clerical or typographical error arising by accident or omission. Any correction of a decision must be made within five days of the delivery of the decision to the Parties. As soon as possible after correcting a decision in accordance with this



paragraph, the *Adjudicator* must deliver a copy of the corrected decision to each of the Parties to the contract. Any correction of a decision forms part of the decision

- If the *Adjudicator's* decision changes an amount notified as due, payment of the sum decided by the *Adjudicator* is due not later than seven days from the date of the decision or the final date for payment of the notified amount whichever is the later.
- W2.4
- Unless the Parties agree otherwise, a Party does not refer any Dispute under or in connection with this contract to the courts unless it has first been decided by the *Adjudicator* in accordance with this contract.
 - If, after the *Adjudicator* notifies his decision, a Party is dissatisfied, that Party may notify the other Party of the matter which he disputes and state that he intends to refer it to the courts. The Dispute may not be referred to the courts unless this notification is given within six (6) weeks of the notification of the *Adjudicator's* decision.
 - The courts settle the Dispute referred to it. The courts have the powers to reconsider any decision of the *Adjudicator* and to review and revise any action or inaction of the *Employer* related to the Dispute. A Party is not limited in court proceedings to the information or evidence put to the *Adjudicator*.
 - A Party does not call the *Adjudicator* as a witness in court proceedings."

Option Y(UK)2 the Housing Grants, Construction and Regeneration Act 1996 (with amendments dated September 2011)

Clause Y(UK) 2.1

Insert new paragraph (3) in Y2.1:

"(3) Pay Less Notice means the notice referred to in clause Y2.3."

Insert the following clauses Y2.1.1-Y2.1.4:

Assessing the

amount due

Y2.1.1 Insert new clause 50.11:

"If the *Contractor's* employment is terminated under clause 91.1 because the *Contractor* has become insolvent within the meaning of Section 113 of the Act (R10A), the *Employer* need not pay any sum due to the *Contractor* other than any amount due to him under clause 90.4 either:

- where the *Contractor* becomes insolvent prior to the prescribed period before the final date for payment, provided that the *Employer* or *Project Manager* issues a Pay Less Notice notifying the *Employer's* intention not to pay such sum, or
- in any event, if the *Contractor* becomes insolvent after the prescribed period before the final date for payment."

Payment

Y2.1.2 Delete the first sentence of clause 51.1 and substitute:

"The *Project Manager* certifies a payment not later than five days after each payment due date and issues a copy of the payment certificate to the *Contractor*."

Y2.1.3 Insert at the end of clause 51.1A:

"The *Contractor* issues a corrected VAT invoice, where required, within five days of receipt of any Pay Less Notice."

Y2.1.4 Insert new clause 51.1B:

"If a certificate is not issued by the *Project Manager* in accordance with clause 51.1, the sum to be paid by the *Employer* is, subject to clause Y2.3, the sum stated as due in the *Contractor's* application in accordance with clause 50.1A."

Dates for payment

Y2.2 Delete the text of Y2.2 and substitute:

"The date on which a payment becomes due is the later of:

- the assessment date; and
- fourteen days after the date of receipt by the *Project*

Manager of the *Contractor's* application for payment in accordance with clause 50.1A.

The final date for payment is twenty eight days or a different period for payment if stated in the Contract Data after the date on which payment becomes due."

Y2.3 Delete "seven days" in line two of Y2.3 and substitute: "one day"

Insert at the end of Y2.3: "In the case of the *Employer*, the notice may be given on his behalf by the *Project Manager*."

Suspension of Performance

Y2.4 Insert at the end of Y2.4: "whether or not the event has been notified by the *Contractor* within the period specified in clause 61.3."

Insert new clauses Y2.5 and Y2.6:

The Project Manager and the Supervisor

Y2.5 Insert new clause 14.5:
"The *Project Manager* is for relevant purposes the "specified person" as defined in Section 110A(6) of the Act."

Termination

Y2.6.1 In the Termination Table in clause 90.2:

Insert 'or R10A' after 'R1-R15'

Insert 'R10A,' after 'R1-R10'

Y2.6.2 Insert a new main bullet at the end of clause 91.1:

- If the other Party has become insolvent as defined in Section 113 of the Act (R10A).

SECONDARY OPTION CLAUSES

Option X4 (Parent Company) Delete "If the guarantee ... within four weeks of the Contract Date" and replace with "If the guarantee was not given before the Contract Date, it is given to the *Employer* upon the execution by the



Guarantee)		<i>Contractor</i> of the Contract Agreement”
Option (Performance Bond)	X13	Delete “If the bond ... within four weeks of the Contract Date” and replace with “If the bond was not given before the Contract Date, it is given to the <i>Employer</i> upon the execution by the <i>Contractor</i> of the Contract Agreement”.
Option (Retention)	X16	Insert a new clause:
“X16.3		X16.3 The <i>Employer</i> has the full beneficial interest in the amount retained, without any fiduciary obligation, and the relationship of the <i>Employer</i> and <i>Contractor</i> with regard to the amount retained is solely that of debtor and unsecured creditor, subject to the terms of this contract”.
[X16.4		Insert a new clause:
		“Retention Bond
		If after the <i>Project Manager</i> certifies Completion for the whole of the <i>works</i> the <i>Contractor</i> wishes to be paid the balance of the retention monies then he submits to the <i>Project Manager</i> a retention bond in substantially the same form as appearing in the Works Information for the amount of such retention monies and issued by a surety acceptable to the <i>Employer</i> . Upon receipt of the retention bond the <i>Employer</i> releases the balance of the retention monies to the <i>Contractor</i> . The retention bond is returned by the <i>Employer</i> to the <i>Contractor</i> upon the later of the issue of the Defects Certificate and the date in which the <i>Contractor</i> makes payment in respect of any uncorrected Defects in accordance with clause 45.1 and/or clause 45.2.]”
Option (Limitation Liability)	X18	At the start of each of clauses X18.1, X18.2, X18.3 and X18.4 insert of “Subject always to clause X18.6”.
		In clause X18.3 insert at the end of the clause:
		“For the avoidance of doubt, the amount stated in the Contract Data is in respect of each and every claim made against the <i>Contractor</i> that arises from any one occurrence or series of occurrences arising out of any one event and not a total limit on the <i>Contractor’s</i> liability for all claims for Defects due to his design”.



In clause X18.4 insert at the end of the clause:

“For the avoidance of doubt the amount stated in the Contract Data is in respect of each and every claim made against the *Contractor* that arises from any one occurrence or series of occurrences arising out of any one event, and not a total limit on the *Contractor’s* liability for all matters arising under or in connection with this contract”.

Option X18.6 Insert new clause X18.6:

“X18.6 Nothing in this clause X18 shall exclude or limit the *Contractor’s* liability for personal injury or death or any matter which it would be illegal for the *Contractor* to exclude or attempt to exclude its liability or for fraud”.

Z2 Warranties

Z2.1 The *Contractor*, within fourteen (14) days of the *Project Manager’s* request, provides to the *Employer* collateral warranties executed as deeds in the forms attached in favour of

- any member of the TfL Group notified to the *Contractor*
- **[OTHER BENEFICIARIES]**

Z2.2 The *Contractor*, within fourteen (14) days of the *Project Manager’s* request, procures that the “Principal Subcontractors” enter into collateral warranties executed as deeds in the forms attached in favour of

- the *Employer*, and
- any member of the TfL Group notified to the *Contractor* by the *Employer*
- **[OTHER BENEFICIARIES]**

and “the Principal Subcontractors” means all Subcontractors with a design responsibility (including those responsible for the selection of goods and materials and the supply of proprietary products and systems) and such other Subcontractors as the *Employer* may from time to time by notice in writing to the *Contractor* specify as being Principal Subcontractors.

Z2.3 The *Employer* specifies at the appropriate time which form of warranty is appropriate for each particular recipient. Where the terms of a collateral warranty grant the recipient a right to stand as substitute for the *Employer*, then



as between the *Contractor* and the *Employer*, upon such recipient of the collateral warranty serving the requisite notice, the *Contractor* treats the said recipient as standing in substitution for the *Employer* and the *Employer* raises no objection to such substitution. Without prejudice to the obligations of the *Contractor* to the *Employer* and to the rights of the *Employer*, the *Employer* is not obliged to make any payment to the *Contractor* if (and for so long as) the *Contractor* fails within the time limit specified above to deliver such warranties duly executed provided always that the *Employer* notifies the *Contractor* of the identity of the relevant beneficiaries.

Z3 *Employer's business*

The *Contractor* acknowledges that it

- has sufficient information about the *Employer* and the *works*, and
- is aware of the *Employer's* processes and business, and
- has made all appropriate and necessary enquiries to enable it to Provide the Works in accordance with this contract, and
- is aware of the purposes for which the *works* are required, and
- shall neither be entitled to any additional payment nor excused from any obligation or liability under this contract due to any misinterpretation or misunderstanding by it of any fact relating to the *works*.

Z4 *Best value*

The *Contractor* acknowledges that the *Employer* is a best value authority for the purposes of the Local Government Act 1999 and as such the *Employer* is required to make arrangements to secure continuous improvement in the way it exercises its functions, having regard to a combination of economy, efficiency and effectiveness. The *Contractor* assists the *Employer* to discharge the *Employer's* duty where possible, and in doing so, inter alia carries out any reviews of the *works* reasonably requested by the *Employer* from time to time. The *Contractor* negotiates in good faith (acting reasonably) any changes to this contract in order for the *Employer* to achieve best value.

Z5 *Data Protection, Freedom of Information and Data Transparency*

- Z5.1** The *Contractor* complies with all of its obligations under the Data Protection Act 1998 and if processing personal data (as such terms are defined in section 1(1) of that Act) on behalf of the *Employer* ("TfL Personal Data"), the *Contractor* only carries out such processing in order to Provide the Works and in accordance with

instructions from the *Employer*.

- Z5.2** When the *Contractor* receives a written request from the *Employer* for information about, or a copy of, TfL Personal Data, the *Contractor* supplies such information or data to the *Employer* within such time and in such form as specified in the request (such time to be reasonable) or if no period of time is specified in the request, then within fourteen (14) days from the date of the request.
- Z5.3** The *Employer* remains solely responsible for determining the purposes and manner in which TfL Personal Data is to be processed. The *Contractor* does not share any TfL Personal Data with any Subcontractor, Indirect Subcontractor or third party unless there is a written agreement in place which requires the Subcontractor, Indirect Subcontractor or third party to
- only process TfL Personal Data in accordance with the *Employer's* instructions to the *Contractor*, and
 - comply with the same data protection requirements that the *Contractor* is required to comply with under this contract.
- Z5.4** The *Contractor* acknowledges that the *Employer* is subject to the Freedom of Information Act 2000 and all subordinate legislation made under it, together with the Environmental Information Regulations 2004 (and any provisions that replace these) and any guidance issued by the Information Commissioner, the Ministry of Justice, or the Department for Environment Food and Rural Affairs (including in each case its successors or assigns) in relation to such legislation and agrees to assist and co-operate with the *Employer* to enable the *Employer* to comply with its obligations under such legislation including providing to the *Employer* such information as the *Employer* may reasonably request concerning this contract within two (2) days of a request from the *Employer*. The *Contractor* further acknowledges that the *Employer* may be obliged under such legislation to disclose information without consulting or obtaining consent from the *Contractor*. Without prejudice to the generality of the foregoing the *Contractor* shall transfer to the *Employer* any request for information under the Act that it receives as soon as reasonably practicable. The *Contractor* shall not itself respond to any person making such a request save to acknowledge receipt, unless expressly authorised to do so by the *Employer*. This clause shall survive the expiry or termination of this contract.
- Z5.5** The *Contractor* acknowledges that the *Employer* is subject to the Transparency Commitment. Notwithstanding clause Z5.4 and clause Z7, the *Contractor* gives its consent for the *Employer* to publish the Contract Information to the general public.



Z5.6 The *Employer* may in its absolute discretion redact all or part of the Contract Information prior to its publication. In doing so and in its absolute discretion the *Employer* may take account of the exemptions/exceptions that would be available in relation to information requested under the Freedom of Information Act 2000 and all subordinate legislation made under it, the Environmental Information Regulations 2004 (and any provisions that replace these) and any guidance issued by the Information Commissioner, the Ministry of Justice, or the Department for Environment Food and Rural Affairs (including in each case its successors or assigns) in relation to such legislation. The *Employer* may in its absolute discretion consult with the *Contractor* regarding any redactions to the Contract Information to be published pursuant to clause Z5.5. The *Employer* makes the final decision regarding publication and/or redaction of the Contract Information.

Z6 Access to Premises

Z6.1 Any TfL Premises made available to the *Contractor* in connection with this contract shall be free of charge and shall be used by the *Contractor* solely so the *Contractor* can Provide the Works provided, for the avoidance of doubt, that the *Contractor* is responsible for its own costs or travel including any congestion charging and/or low emission charging. The *Contractor* shall

- have the use of such TfL Premises as licensee and shall not have or purport to claim any sole or exclusive right to possession or to possession of any particular part of such TfL Premises,
- vacate such TfL Premises upon the termination or expiry of the contract or at such earlier date as the *Employer* may determine,
- not exercise or purport to exercise any rights in respect of any TfL Premises in excess of those granted under this clause Z6.1,
- ensure that the *Contractor's* employees, Subcontractors and Indirect Subcontractors and persons connected to them carry any identity passes issued to them by the *Employer* at all relevant times and comply with the *Employer's* security procedures as may be notified by the *Employer* from time to time, and
- not damage the TfL Premises or any assets on the TfL Premises.

Z6.2 Nothing in this clause Z6 shall create or be deemed to create the relationship of landlord and tenant in respect of any TfL Premises between the *Contractor* and any member of the TfL Group.

Z6.3 The *Employer* shall be under no obligation to provide office or other



accommodation facilities or services (including telephony and IT services) to the *Contractor* except as may be specified in the Works Information.

- Z6.4** The *Employer* is responsible for maintaining the security of TfL Premises in accordance with its standard security requirements. The *Contractor* shall comply with all of the *Employer's* security requirements while on TfL Premises, and shall ensure that all of the *Contractor's* employees, Subcontractors, Indirect Subcontractors and persons related to them comply with such requirements. Upon request, the *Employer* shall provide the *Contractor* with details of the *Employer's* security procedures.
- Z6.5** The *Employer* reserves the right under this contract to refuse to admit to any TfL Premises any of the *Contractor's* employees, Subcontractors, Indirect Subcontractors and persons related to them who fail to comply with any of the *Employer's* policies and standards referred to in this contract.
- Z6.6** The *Employer* reserves the right under this contract to instruct any of the *Contractor's* employees, Subcontractors, Indirect Subcontractors and persons related to them personnel to leave any TfL Premises at any time for any reason and such personnel shall comply with such instructions immediately.
- Z6.7** Where the *Contractor* is required to access (with appropriate permission and approval of the *Employer*) any areas under the control of any of the *Employer's* PPP or PFI contractors, the *Contractor* must comply (and ensure that any Subcontractor's and Indirect Subcontractors comply) with all of their rules, regulations and standards as appropriate.

Z7 Confidentiality and Publicity

- Z7.1** The *Contractor* acknowledges that during the course of this contract it may receive, obtain, prepare or create confidential information. The *Contractor*
- Z7.1(1)** receives and/or maintains the confidential information in strictest confidence and acknowledges that such information is of a proprietary and confidential nature,
- Z7.1(2)** does not use the confidential information for any purposes whatsoever (and in particular does not use the confidential information to the detriment of the *Employer*) other than to Provide the Works,
- Z7.1(3)** does not disclose the confidential information to any third party without the prior written consent of the *Project Manager* except that the *Contractor* is entitled to the extent strictly necessary to disclose the confidential information



- Z7.1(3)(a)** to such of the *Contractor's* Subcontractors, Indirect Subcontractors and personnel who need to know the confidential information in order to Provide the Works provided that the *Contractor* is responsible for any breach of its obligations occasioned by any act or omission of such Subcontractors, Indirect Subcontractors or personnel, or
- Z7.1(3)(b)** to the *Contractor's* auditors and any other person or body having a legal right or duty to know the confidential information in connection with the *Contractor's* business provided that prior to such disclosure the *Contractor* consults with the *Project Manager* as to the proposed form of such disclosure,
- Z7.1(4)** informs each of the persons referred to in clauses Z7.1(3)(a) and Z7.1(3)(b) to whom confidential information is disclosed of the restrictions as to use and disclosure of the confidential information and uses its best endeavours to ensure that each of them observe such restrictions,
- Z7.1(5)** at the *Employer's* request and in any event upon the termination or expiry of the contract, promptly delivers to the *Employer* or destroys as the *Employer* directs all documents and other materials in its possession, custody or control (or the relevant parts of such materials) that bear or incorporate the whole or any part of the confidential information and if instructed by the *Project Manager* in writing, removes all electronically held confidential information, including (without limitation) the purging of all disk-based confidential information and the reformatting of all disks, and
- Z7.1(6)** does not, except where provided in clause Z7.1(3), or without the prior written consent of the *Project Manager*, disclose to any third party the nature or content of any discussions or negotiations relating to the confidential information.
- Z7.2** The obligations set out in clause Z7.1 do not apply to any confidential information which
- Z7.2(1)** the *Contractor* shows by documentary evidence was already in its lawful possession and at its free disposal before the disclosure to the *Contractor* by the *Employer*, or
- Z7.2(2)** is lawfully disclosed to the *Contractor* without any obligations of confidence, by a third party who has not derived it directly or

indirectly from the *Employer*, or

Z7.2(3) is or has come into the public domain through no fault of the *Contractor* or its personnel, or

Z7.2(4) is required by law or by order of a court of competent jurisdiction to be disclosed.

Z7.3 The *Contractor* acknowledges that damages would not be an adequate remedy for any breach of clause Z.7.1 and that (without prejudice to all other remedies which the *Employer* may be entitled to as a matter of law) the *Employer* is entitled to the remedies of injunction, specific performance and other equitable relief to enforce the provisions of this clause and no proof of special damages is necessary for the enforcement of the provisions of this clause.

Z7.4 The *Contractor* does not advertise or announce this contract or that it is to Provide the Works without the prior written consent of the *Project Manager* and the *Project Manager* on behalf of the *Employer* has the right to approve any advertisement or announcement before it is made.

Z7.5 Neither the *Contractor* nor anyone employed by him or acting on his behalf shall give information concerning the *works* for publication in the press or on radio, television, screen or any other media without the prior written consent of the *Project Manager* and, if such consent is given, shall provide to the *Project Manager* a full copy of the information to be released and shall not release any such information until the *Contractor* has received the *Project Manager's* prior written consent as to the content of the information to be released. The *Contractor* shall not, without the prior written approval of the *Project Manager*, take or permit to be taken any photographs of the *works* for use in any publicity or advertising.

Z8 Conflict of Interest

Z8.1 The *Contractor* acknowledges and agrees that it does not have any interest in any matter where there is or is reasonably likely to be a conflict of interest with the provision of the *works* or any member of the TfL Group, save to the extent fully disclosed to and approved in writing by the *Employer*.

Z8.2 The *Contractor* undertakes ongoing and regular conflict of interest checks throughout the duration of this contract and in any event not less than once in every six months and notifies the *Employer* in writing immediately on becoming aware of any actual or potential conflict of interest with the provision of the *works* under this contract or any member of the TfL Group and shall work with the *Employer* to do whatever is necessary (including the separation of staff working or, and data relating to, the *work* from the matter in question) to manage such conflict to the *Employer's* satisfaction, provided that, where the



Employer is not so satisfied (in its absolute discretion) it shall be entitled to terminate the contract.

Z9 Compliance with Policies

Z9.1 The *Contractor* notifies its personnel Subcontractors and Indirect Subcontractors and the *Employer* of any health and safety hazards that exist or that may arise in connection with the provision of the *works* of which the *Contractor* is aware or ought reasonably to be aware.

Z9.2 The *Contractor* undertakes that all its personnel and those of its Subcontractors and Indirect Subcontractors comply with all of the *Employer's* policies and standards that are relevant to the provision of the *works*, including those relating to safety, security, business ethics, responsible procurement, work place harassment, drugs and alcohol and illegal substances and any other on site regulations specified by the *Employer* for personnel working at TfL Premises or accessing the *Employer's* computer systems. The *Employer* provides the *Contractor* with copies of such policies on request.

Z9.3 The *Contractor* shall as he Provides the Works (while taking into account best available techniques not entailing excessive cost and the best practicable means of preventing, or counteracting the effects of any noise or vibration) have appropriate regard (insofar as the *Contractor's* activities may impact on the environment) to the need to

- preserve and protect the environment and to the need to avoid, remedy and mitigate any adverse effects on the environment,
- enhance the environment and have regard to the desirability of achieving sustainable development,
- conserve and safeguard flora, fauna and geological or physiological features of special interest, and
- sustain the potential of natural and physical resources and the need to safeguard the life-supporting capacity of air, water, soil and ecosystems.

Z10 Records, Audit and Inspection

Z10.1 In this clause Z10

"Records" means

- all necessary information for the evaluation of claims or compensation events, whether or not relating to Subcontractors and/or Indirect



Subcontractors,

- management accounts, information from management information systems and any other management records,
- accounting records (in hard copy as well as computer readable data),
- sub-contract files (including proposals of successful and unsuccessful bidders, bids, rebids, etc.),
- original estimates,
- estimating worksheets,
- correspondence,
- compensation event files (including documentation covering negotiated settlements),
- schedules including capital works costs, timetable and progress towards Completion,
- general ledger entries detailing cash and trade discounts and rebates,
- commitments (agreements and leases) greater than £5,000 (five thousand pounds),
- detailed inspection records,
- such materials prepared in relation to the invitation to tender and subsequent tendering process relating to cost breakdowns, in each case which have not already been provided to the *Employer*, and
- accounts and records of the Price for Works Done to Date and all other amounts to be paid to the *Contractor* under this contract.

Z10.2 The *Contractor* maintains and procures in each subcontract that each of his Subcontractors, maintains and retains the Records for a minimum of twelve (12) years from Completion with respect to all matters for which the *Contractor* and his Subcontractors and Indirect Subcontractors are responsible under this contract. The *Contractor* procures that each subcontract contains open-book audit rights in favour of the Employer and any novated *Employer* and their authorised representatives.

Z10.3 The *Contractor* undertakes and procures that his Subcontractors and Indirect Subcontractors undertake their obligations and exercise any rights which relate



to the performance of this contract on an open-book basis. The *Employer* and/or any novated *Employer* and their authorised representatives may from time to time audit on an open-book basis and check any and all information regarding any matter relating to the performance of or compliance with this contract, including without limitation, inspection of the *Contractor's* technical and organisational security measures for the protection of personal data, any aspect of the *Contractor's* operations, costs and expenses, sub-contracts, claims related to compensation events, and financial arrangements or any document referred to therein or relating thereto. The *Employer's* and any novated *Employer's* rights pursuant to this sub-clause include the right to audit and check and to take extracts from any document or record of the *Contractor* and/or his Subcontractors and Indirect Subcontractors including, without limitation, the Records.

Z10.4 The *Contractor* promptly provides (and procures that his Subcontractors and Indirect Subcontractors promptly provide) all reasonable co-operation in relation to any audit or check including, to the extent reasonably possible in each particular circumstance by

- granting or procuring the grant of access to any premises used in the *Contractor's* performance of this contract, whether the *Contractor's* own premises or otherwise,
- granting or procuring the grant of access to any equipment or system (including all computer hardware and software and databases) used (whether exclusively or non-exclusively) in the performance of this contract, wherever situated and whether the *Contractor's* own equipment or otherwise,
- making any contracts and other documents and records required to be maintained under this contract (whether exclusively or non-exclusively) available for audit and inspection,
- providing a reasonable number of copies of any subcontracts and other documents or records reasonably required by the *Employer's* and/or any novated *Employer's* auditor and/or granting copying facilities to the *Employer's* and/or any novated *Employer's* auditor for the purposes of making such copies, and
- complying with the *Employer's* and/or any novated *Employer's* reasonable requests for access to senior personnel engaged by the Contractor in the performance of this contract and/or the *works*.



Z11 Corrupt Gifts, Fraud and the Payment of Commission

Z11.1 The *Contractor* does not, and ensures that its employees, agents Subcontractors and Indirect Subcontractors do not, pay any commission, fees or grant any rebates to any employee, officer or agent of the *Employer* or any member of the TfL Group nor favour any employee, officer or agent of the *Employer* or any member of the TfL Group with gifts or entertainment of significant cost or value nor enter into any business arrangement with employees, officers or agents of the *Employer* or any member of the TfL Group other than as a representative of the *Employer*, without the *Employer's* prior written approval.

Z11.2 If any fraudulent activity comes to the attention of the *Contractor* in relation to this contract the *Contractor* notifies the *Employer* by the most expeditious means available. The *Contractor* cooperates with the *Employer* in the investigation of any fraudulent activity and implements any changes in the procedures or working practices employed under the contract as may be necessary to ensure that the likelihood or opportunity for a recurrence of such fraud is minimised. The *Contractor* ensures that no fraudulent activity is committed by the *Contractor*, its agents, employees, Subcontractors or Indirect Subcontractors.

Z11.3 The *Employer* has the right to audit any and all such records necessary to confirm compliance with clause Z11.1 and Z11.2 at any time during the duration of this contract and during the 6 year period following expiry or termination of this contract. Breach of clause Z11.1 and/or Z11.2 shall entitle the *Employer* to terminate this contract and any other contracts between the *Contractor* and the TfL Group immediately.

Z11.4 In the event of any breach of this clause Z11 by the *Contractor* the *Employer* recovers any loss liability or damage incurred or suffered as a result of the breach of this clause by the *Contractor*.

Z12 Quality Statement

Z12.1 The quality statement sets out the *Contractor's* proposals for the management and resourcing of the *works*.

Z12.2 The *Contractor* warrants that the representations contained in the quality statement section of his tender are accurate in every respect and may be fully relied upon by the *Employer*, including where the standards represented exceed the minimum originally specified by the *Employer*.

Z12.3 Should any discrepancy arise between the quality statement and other contract documents the Works Information takes precedence except where the quality statement includes a standard which exceeds that specified in the other contract



documents, in which case the quality statement shall take precedence over those other documents.

Z13 Quality Management System

The *Contractor* operates a quality management system complying with BS EN ISO 9002 for his performance of the contract. The management, organisation, responsibilities, procedures, processes, resources and programme for the quality management system from design (where applicable) to procurement, construction, completion, testing and commissioning of the *works* until the *defects date* is contained in a quality plan which is submitted to the *Employer* in accordance with the Works Information. Any Subcontractor appointed by the *Contractor* operates a quality system enabling him to comply with the *Contractor's* quality management system.

Z14 Responsibility for Statutory Undertakers

[Z14.1] The *Contractor* on behalf of the *Employer*

- identifies those measures which need to be taken as a consequence of or in order to facilitate the *works* with any Statutory Undertaker,
- agrees a specification for the measures which need to be taken and determines by whom those measures are to be taken with the Statutory Undertaker,
- co-ordinates the taking of those measures and the execution of the *works* with the Statutory Undertaker,

and the *Employer* as the *Contractor's* principal pays the Statutory Undertaker's allowable costs in respect of these measures.

The *Contractor*

- is responsible (at no cost to the *Employer*) for ensuring the Statutory Undertaker's compliance with any agreement or arrangement entered into under clause Z14
- indemnifies and keeps indemnified the *Employer* against
 - all claims demands actions and proceedings
 - costs charges and expenses arising therefrom
 - loss or damage to any property
 - increased costs of working or

- business interruption

which may be brought or made by any Statutory Undertaker in connection with such an agreement including but not limited to the negligence or default of the *Contractor*.

Z14.2 The *Contractor* allows in any programme required under this contract, any notice period required by a Statutory Undertaker in relation to any matter which is the subject of clause Z14.1 and for all periods required in the taking of measures which are the subject of clause Z14.1.]

Z15 Nuisance

Z15.1 The *Contractor* at all times prevents any public or private nuisance (including, without limitation, any such nuisance caused by noxious fumes, noisy working operations or the deposit of any material or debris on the public highway) or other interference with the rights of any adjoining or neighbouring landowner, tenant or occupier or any statutory undertaker arising out of the carrying out of the *works* or of any obligation under clause 43 and assists the *Employer* in defending any action or proceedings which may be instituted in relation to the same. The *Contractor* is responsible for and indemnifies the *Employer* from and against any and all expenses, liabilities, losses, claims and proceedings whatsoever resulting from any such nuisance or interference, except only where such nuisance or interference is the consequence of an instruction of the *Employer*.

Z15.2 Without prejudice to the *Contractor's* obligations under clause Z15.1, the *Contractor* ensures that there is no trespass on or over any adjoining or neighbouring property arising out of the *works* or of any obligation under clause 43. If the carrying out of the *works* or of any obligation under clause 43 is likely to necessitate any interference (including, without limitation, the oversailing of tower crane jibs) with the rights of adjoining or neighbouring owners or occupiers, then the *Contractor*, at no cost to the *Employer*, obtains the prior written agreement of such owners and/or occupiers to the work, and such agreement will be subject to the approval of the *Employer* before execution. The *Contractor* complies in every respect with any conditions in any such agreement.

Z16 Construction Industry Scheme

Z16.1 Where the Construction Industry Scheme applies to any payment to be made by the *Employer* to the *Contractor* under this contract, the obligations of the *Employer* to make such payment will be subject to the provisions of the Construction Industry Scheme. Unless and until HM Revenue and Customs confirms to the *Employer* that the *Employer* can make any payment to the



Contractor without any tax deduction, the *Employer* deducts any tax from payments due to the *Contractor* under this contract at the rate specified by HM Revenue and Customs pursuant to the Construction Industry Scheme before paying the balance to the *Contractor*. The *Employer* accounts to HM Revenue and Customs for any tax so deducted.

Z17 Use of Existing Services

[The *Employer* does not warrant the suitability or availability of installations and services for the *Contractor's* use and the *Contractor* shall take measures to supplement them as necessary.]

Z18 2012 London Games

The *Contractor* shall not (without the prior written approval of the London Organising Committee of the Olympic Games Limited ("LOCOG") in each case) represent that any products or services provided under this contract have been endorsed or approved by the *Employer*, the British Olympic Association, the British Paralympics Association, LOCOG or any other official Olympic or Paralympic body, or that the *Contractor* (including any of its products or services) are in any way associated with those organisations, the Olympic Games and/or Paralympic Games, or London 2012, including by publishing or issuing any statement (factual or otherwise) about the *Contractor's* provision of the *works* for the *Employer*.

Z19 Equality & Diversity Compliance

Z19.1 Without limiting the generality of any other provision of the contract, the Contractor

- does not unlawfully discriminate,
- procures that its personnel do not unlawfully discriminate, and
- uses reasonable endeavours to procure that its Subcontractors and any Indirect Subcontractors do not unlawfully discriminate when providing the works.

within the meaning and scope of

- the Sex Discrimination Act 1975,
- the Race Relations Act 1976 (including the Race Relations (Amendment) Act 2000),
- the Disability Discrimination Act 1995 (as amended by the Disability Discrimination Act 2005),



- the Employment Equality (Sexual Orientation) Regulations 2003,
- the Employment Equality (Religion or Belief) Regulations 2003,
- the Equality Act 2006, and
- any other relevant enactments in force from time to time relation to discrimination in employment.

Z19.2 The Contractor acknowledges that the Employer is under a duty under Section 71 of the Race Relations Act 1976 to have due regard to the need to eliminate unlawful racial discrimination and to promote equality of opportunity and good relations between persons of different racial groups. In the performance of the contract, the Contractor assists and co-operates and uses reasonable endeavours to procure that its Subcontractors and Indirect Subcontractors assist and co-operate with the Employer where possible in satisfying this duty.

Z19.3 The Contractor acknowledges that the Employer is under a duty by virtue of a Mayor of London's direction under Section 155 of the Greater London Authority Act 1999 (in respect of the Greater London Authority's duty under section 404(2) of the Greater London Authority Act 1999) to have due regard to the need to

- promote equality of opportunity for all persons irrespective of their race, gender, disability, age, sexual orientation or religion,
- eliminate unlawful discrimination, and
- promote good relations between persons of different racial groups, religious beliefs and sexual orientation,

and in the performance of the contract, the *Contractor* assists and co-operates and uses reasonable endeavours to procure that its Subcontractors and Indirect Subcontractors assist and co-operate with the *Employer* where possible to enable the *Employer* to satisfy its duty.

Z19.4 The *Employer's* Workplace Policy requires the *Employer's* own staff and those of its Subcontractors and Indirect Subcontractors to comply fully with the Workplace Policy to eradicate harassment in the workplace. The *Contractor*

- ensures that its staff, and those of its Subcontractors and Indirect Subcontractors who are engaged in the performance of the contract are fully conversant with the requirements of the Workplace Policy,
- fully investigate allegations of workplace harassment in accordance



with the Workplace Policy, and

- ensures that appropriate effective action is taken where harassment is found to have occurred.

Z19.5 The *Contractor* acknowledges that the *Employer* is under a duty under Section 49A of the Disability Discrimination Act 1995 (as amended by the Disability Discrimination Act 2005) to have due regard to the need to

- eliminate discrimination that is unlawful under the Disability Discrimination Acts,
- eliminate harassment of disabled persons related to their disabilities and promote equality of opportunity between disabled persons and other persons,
- take steps to take account of disabled persons' disabilities (even when that involves treating disabled persons more favourably than other persons), and
- promote positive attitudes towards disabled persons and encourage participation by disabled persons in public life,

and in the performance of the contract, the *Contractor*, assists and co-operates, and uses reasonable endeavours to procure that its Subcontractors and Indirect Subcontractors assist and co-operate, with the *Employer* where possible to enable the *Employer* to satisfy its duty.

Z19.6 The *Contractor* assists and co-operates with the *Employer* and uses reasonable endeavours to procure that its Subcontractors and Indirect Subcontractors assist and co-operate where possible with the *Employer's* compliance with its duties under section 1 and section 149 of the Equality Act 2010 as and when section 1 and/or section 149 come into force, including any amendment or re-enactment of section 1 or section 149, and any guidance, enactment, order, regulation or instrument made pursuant to these sections.

Z20 Considerate Constructor Scheme

The *Contractor*

- registers the Site under the Considerate Constructor Scheme
- complies with the Considerate Constructor Scheme's Code of Considerate Practice when he Provides the Works.

**Z21 Design Check Certificate**

[All design prepared by the *Contractor* and submitted to the *Project Manager* is supported by a design check certificate in the form attached to the Works Information signed by an appropriately qualified and experienced engineer other than the engineer who prepared the design. If the certifying engineer is not an employee of the *Contractor*, he is a Subcontractor.]

Z22 Goods vehicles operator's licence

[Each goods vehicle used by the *Contractor* or his Subcontractors in connection with this contract displays the vehicle licence disc relevant to the goods operator's licence under which the vehicle is operated or, in the absence of an operator's licence disc, the vehicle carries documentation giving the operator's licence number, name and address.]

Z23 Computer Equipment

[Any software, electronic or magnetic media, hardware or computer system used or supplied by the *Contractor* in connection with this contract

- is Euro compliant, and
- is compliant with the UK Government's "e-government interoperability framework" standard, as may be updated from time to time, details of which are available on the Cabinet Office website, www.govtalk.gov.uk, and
- does not have its functionality or performance affected, be made inoperable or be more difficult to use by reason of any date related input or processing in or on any part of such software, electronic or magnetic media, hardware or computer system, and
- does not cause any damage, loss or erosion to or interfere adversely or in any way with the compilation, content or structure of any data, database, software or other electronic or magnetic media, hardware or computer system used by, for or on behalf of the *Employer* and/or any other member of the TfL Group on which it is used or with which it interfaces or comes into contact, and
- any variations, enhancements or actions undertaken by the *Contractor* in respect of such software, electronic or magnetic media, hardware or computer system does not affect the *Contractor's* compliance with this warranty.]



Z24 Equality & Diversity

Z24.1 Strategic Equality & Diversity Plan

Not Used

Z24.2 Diversity Training

Not Used

Z24.3 Supplier Diversity

Not Used

Z24.4 Communications Plan

Not Used

Z24.5 Monitoring and Reporting

Not Used

Z24.6 Equality and Diversity Infractions

Not Used

Z24.7 Equality and Diversity Audit

Not Used

Z25 Strategic Labour Needs and Training

Not Used

Z26 Sustainable Timber

Not Used

Z27 London Living Wage

Z27.1 For the purposes of this clause the "London Living Wage" is the basic hourly wage published on http://www.london.gov.uk/mayor/economic_unit/workstreams/living-wage.jsp (or any replacement web address) as may be updated from time to time.

Without prejudice to any other provision of this contract the *Contractor*

Z27.1.1 ensures that none of its employees, and uses reasonable endeavours to procure that none of the employees of its Subcontractors and Indirect Subcontractors engaged in the provision of the *works* is paid an hourly wage (or equivalent hourly wage) less than the London Living Wage,

Z27.1.2 ensures that none of its employees, and uses reasonable endeavours to procure that none of the employees of its Subcontractors and

Indirect Subcontractors, engaged in the provision of the *works* is paid less than the amount to which they are entitled in their respective contracts of employment, and

Z27.1.3 disseminates on behalf of the *Employer* to those of its employees who are engaged in the provision of the *works* and were paid the London Living Wage and to its Subcontractors and Indirect Subcontractors such perception questionnaires as the *Employer* may reasonably require from time to time and promptly collates and returns to the *Employer* responses to such questionnaires.

Z27.2 Any breach by the *Contractor* of the provisions of clause Z27.1 is treated as a substantial failure by the *Contractor* to comply with an obligation under this contract for the purposes of clause 91.2.

Z28 Single Point Design Responsibility

Z28.1 In this Option, "Employer's Design Information" means any drawings, proposals, specifications, method statements, designs, plans, schemes or other documents, or concepts prepared or developed by the *Employer* and included in the Works Information.

Z28.2 The *Contractor* is deemed to have scrutinized, prior to the Contract Date, the *Employer's* Design Information. The *Contractor* is responsible for the design of the works and for the accuracy of such *Employer's* Design Information except as stated in clause Z28.3 below.

Z28.3 The *Employer* is not responsible for any error, inaccuracy or omission of any kind in the *Employer's* Design Information as originally included in the contract. The *Employer* does not give any representation or warranty as to the accuracy, status or completeness of the *Employer's* Design Information, except as stated below.

The *Employer* is responsible for the correctness of the following elements of the *Employer's* Design Information:

- (a) data and information stated in the Works Information as being the responsibility of the *Employer*,
- (b) definitions of intended purposes of the works or any part thereof, and
- (c) criteria for the testing and performance of the completed works.

Z28.4 Where there is a mistake, inaccuracy or discrepancy in or omission from the *Employer's* Design Information, the *Contractor* informs the *Project manager* in writing of his proposed amendment to remove the mistake, inaccuracy,



discrepancy or omission. Within two weeks, the *Project manager* may consent to the *Contractor's* proposed amendment or comment in writing on such an amendment provided that the *Project manager* does not unreasonably withhold his consent to a proposed amendment. The *Contractor* takes account of such comments and resubmits his proposed amendment to the *Project manager*. Such process is repeated until the *Project manager* accepts the *Contractor's* proposed amendment.

Z28.5 The following shall not give rise to a compensation event:

- (a) anything which is the *Contractor's* responsibility as set out in this Option Z28;
- (b) any comment, failure to comment or delay in commenting by the Project Manager in connection with this Option Z28 (which shall also not be treated as an act of prevention or breach of contract by the Employer); or
- (c) any discrepancy, mistake, inaccuracy in, or omission from, the *Contractor's* design and/or the Employer's Design Information.

Transport for London
Docklands Light Railway



SCHEDULE 2
Insurance Table

<i>INSURANCE AGAINST</i>	<i>WHICH PARTY PROVIDES</i>	<i>MINIMUM AMOUNT OF COVER OR MINIMUM LEVEL OF INDEMNITY</i>
<p>Construction All Risks Insurance</p> <p>All risks of loss or damage (not excluded by the terms and conditions of the policy) to the permanent <i>works</i> and materials or equipment for incorporation therein, the temporary works (i.e. other works erected or constructed for the purpose of making possible the erection or installation of the permanent <i>works</i>) constructional plant and equipment temporary buildings and other property owned by or supplied by the <i>Employer</i>.</p>	<p><i>Employer</i> in the joint names of the Parties</p>	<p>The total sum of the replacement cost.</p> <p>Subject to deductibles as stated in the Contract Data Part 1</p>
<p>Public Liability Insurance</p> <p>All sums for which the insured shall become legally liable to pay as damages in respect of death of or injury or illness or disease to third parties and/or loss of or damage to third party property obstruction loss of amenities trespass nuisance or any like cause happening during the period of insurance and arising out of or in connection with this contract</p>	<p><i>Employer</i></p>	<p>£10,000,000 any one occurrence and unlimited in the period of insurance.</p> <p>Subject to deductibles as stated in the Contract Data Part 1</p>
<p>Employer Liability Insurance</p> <p>Liability for death of or bodily injury or illness sustained by employees of the <i>Contractor</i> arising out of or in the course of their employment in connection with this contract</p>	<p><i>Contractor</i></p>	<p>Minimum cover of £5,000,000.00 (Five Million Pounds)</p>

<p>Loss or damage to constructional plant, tools, equipment, temporary buildings (including contents therein) belonging to or the responsibility of the <i>Contractor</i></p>	<p><i>Contractor</i></p>	<p>The replacement cost</p>
<p>Professional Indemnity Insurance Negligence omission or default in respect of design of the <i>works</i> for which the <i>Contractor</i> is responsible</p>	<p><i>Contractor</i></p>	<p>£1,000,000 in the annual aggregate</p>



Custom House and London City Airport Escalator Repair Works

2018-055-01

Works Information



WI 100 DESCRIPTION OF THE WORKS

WI 101.1 Introduction

- (1) The Docklands Light Railway (the “DLR”) is a modern driverless, electrically operated, high frequency urban rail system covering the Docklands area in East and South East London, United Kingdom. The Railway currently has 39 route kilometres of track, 45 stations and operates 149 light rail vehicles.
- (2) Docklands Light Railway Limited (“DLRL”) is the owner of the DLR assets and is the authority responsible for the DLR. DLRL is part of Transport for London (“TfL”) which is responsible for the delivery of London's transport services on behalf of the Mayor of London.
- (3) The Docklands Light Railway Limited, hereinafter referred to as the “Employer” is part of Transport for London (“TfL”) owns and is responsible for the Docklands Light Railway (the “DLR”).

WI 105.1 General description of the works

- (1) The *works* are the post-storage overhaul of 2No. KONE E3H 30° escalators assets at Custom House DLR Station and the mid-life overhaul of 2 No escalator assets at London City Airport DLR station more fully detailed elsewhere within this Works Information.
- (2) The descriptions of items of work or requirements in this Works Information including in any specification or drawings referred to therein are not intended to limit or exclude anything that a competent *Contractor*, experienced in carrying out work of similar size, scope, nature and complexity to the *works* ought reasonably to have known would be required to satisfy the *Employer's* requirements and to properly carry out and complete the *works*. The *Contractor* acknowledges that the *Employer* is relying on the *Contractor* in this regard.

WI 110 Project Objectives and Philosophy

- (1) The strategic objective of the works to the Custom House and London City Airport escalator assets overhaul works is to bring the assets back up to a recognised standard prior to them being returned to customer use and to ensure the ongoing reliability & availability of the DLR escalators for use by our customers.

Specific objectives being targeted are:

- (i) Replace life expired; broken; damaged; perished and/or worn components;
- (ii) Reduce energy consumption by incorporating improved / new technology, where possible (e.g. automatic start/stop etc.)
- (iii) Address any non-compliance with DLR and British Standards;
- (iv) Improve customer perception;
- (v) Uphold or (ideally) reduce remaining whole life costs by improving RAMS and MTBF;



- (vi) Reduction in the cost of spares inventory by standardisation, where possible, on the products of a smaller number of manufacturers / suppliers.

WI 112 Contractor General Obligations

- (1) The *Contractor's* price for the *works* is deemed to include for all the requirements and obligations set out and/or referred to and/or reasonably inferred in the Works Information unless it is expressly stated by the *Employer* to be the responsibility of the *Employer*.
- (2) The *Contractor* does everything expected and necessary that a prudent, competent and experienced *Contractor* would do to assess the risks under the Contract including, without limitation:
 - (i) Obtaining comprehensive knowledge as to the availability and cost of labour including the costs of complying with obligations imposed by any agreement between the relevant industry unions and *Employers* relating to the execution of such work as is required for the *works*;
 - (ii) Obtaining comprehensive knowledge of all requirements in relation to the *works* generally, including the working hours within which the *works* may be performed on Site and any measures which are necessary arising from execution of the *works*; and
 - (iii) Obtaining all appropriate professional and technical advice on all matters and circumstances in respect of the *works* prior to submitting its tender for the *works*.
- (3) Failure by the *Contractor* to properly assess the risks he has taken does not relieve the *Contractor* of his obligations under this Contract and is not a compensation event under the Contract

WI 115 Site Location

- (1) The *Site* for the *works* is Custom House Station and London City Airport Station. Further relevant information is contained in the Site Information.

WI 200 CONSTRAINTS ON HOW THE CONTRACTOR PROVIDES THE WORKS

WI 201 General Constraints

WI 201.1 Legislation

- (1) The *Employer* is under a duty under section 76a of the Sex Discrimination Act 1975, section 71 of the Race Relations Act 1976 and under section 49a of the Disability Discrimination Act 1995 to have due regard to the need to eliminate unlawful discrimination on the grounds of sex or marital status, race or disability (as the case may be) and to promote equality of opportunity between persons of different racial groups and between disabled people and other people (as the case may be). In providing the works, the *Contractor* shall assist and cooperate



with the *Employer* where possible in satisfying this duty.

- (2) The *Contractor* acknowledges that where the *Employer* is under a duty by virtue of a direction under Section 155 of the Greater London *Employer* Act 1999 in respect of section 404(2) of that Act to have due regard to the need to:
- (i) Promote equality of opportunity for all persons irrespective of race, sex, disability, age, sexual orientation or religion;
 - (ii) Eliminate unlawful discrimination; and
 - (iii) Promote good relations between persons of different racial groups, religious beliefs and sexual orientation,

and in providing the works, the *Contractor* assists and co-operates with the *Employer* where possible to enable the *Employer* to satisfy its duty;

WI 201.2 Confidentiality

- (1) The *Contractor* keeps all details and information regarding the contract confidential and shall not, without the prior consent of the *Project Manager*, take or authorise the taking of any photographs of the project for use in any publicity or advertising nor publish alone or in conjunction with any other person any articles, photographs or other illustrations or information relating to the contract or any part of it, whether printed, or on any website or otherwise, nor shall he impart to any publication, journal or newspaper or any radio or television programme any information about the contract.
- (2) During the term of this contract and after its expiry or termination for any reason, each of the parties undertakes to the other to keep the Confidential Information confidential, except where:
- (iv) the Confidential Information was already lawfully known, or became lawfully known to the relevant party independently;
 - (v) the Confidential Information is, or comes into, the public domain other than due to wrongful use or disclosure by the relevant party;
 - (vi) disclosure or use is necessary by the relevant party in connection with entry into this deed or for the proper and effective performance of his obligations under this deed (including disclosure by either party to his insurers and professional advisers); or
 - (vii) disclosure is required by law to any government, governmental department, agency, regulatory or fiscal body or *Employer* (whether national or foreign).



- (3) Each of the parties ensures that his respective employees, agents, sub-*Contractors* and nominees comply with the requirements for confidentiality and the *Contractor* ensures that all of his professional advisers, agents, sub-*Contractors* and nominees sign a confidentiality undertaking in a form consistent with the *Contractor's* obligations for confidentiality.
- (4) Each of the parties notifies the other immediately if it becomes aware of a breach of this clause by any person to whom Confidential Information has been divulged and shall give the other party all reasonable assistance in connection with any proceedings against that person.

WI 201.3 Language

- (1) If the *Contractor* or any of his subcontractors employs operatives who do not speak English or who do not fully understand spoken or written English, the *Contractor* provides a supervisor who is fluent in English and fluent in the language of the operative

WI 203 Constraints Associated with the Operational Railway

WI 203. 1 General

- (1) The *Contractor* acknowledges and is aware that during the course of the *works* the Docklands Light Railway must remain operational during normal operational hours save for any derogations to such an obligation as expressly stated in this Works Information
- (2) The *Contractor* ascertains any noise restrictions in respect of the operational railway and complies with all requirements and obtains any approvals necessary for same.
- (3) The *Contractor* clears away all tools, materials, rubbish and debris at the end of each shift so as not to interfere with the operational railway;
- (4) The *site* must be handed back at the end of each working shift in accordance with the Handover/Handback Strategy. The *Contractor* complies with all the requirements of the Handover/Handback Strategy and the WORM.
- (5) Notwithstanding any other provision in the Contract, the *Contractor* is responsible for all costs associated with any disruption to the operational railway caused by the *Contractor*.

WI 205 Constraints Associated with the Site

WI 205.1 Site Investigation

- (1) The *Contractor* is deemed to have visited the Sites and allows for all the physical and or other working conditions, including without limitation constraints associated with; accessibility, surroundings, storage space for materials and any required additional handling and transporting for materials.
- (2) The *Contractor* is deemed to have carried out investigations as necessary in order to gain a complete understanding of the physical conditions and all matters that are associated with the Sites, including:



- (i) visiting and examining the Sites and its surroundings and doing everything possible to inform himself fully as to the physical conditions and/or features of the Sites,
- (ii) ascertaining the local conditions near or relevant to the Sites, or any other condition or characteristic of the Site affecting or which may affect the *Contractor*.
- (iii) obtaining all necessary information as to risks, contingencies and other circumstances which could have an effect on the performance and cost of executing the *works*;
- (iv) informing himself of the nature of the *works* and the means of access to and facilities at the Sites and transport facilities for deliveries of materials to or from the Sites;

Claims from the *Contractor* in respect of these matters will not be entertained.

WI 205.2 Schedule of Condition

- (1) Prior to commencement of the *works* the *Project Manager* and the *Contractor* agrees the condition of the Sites and of any Site working areas. The condition of the Sites and any Site working areas will be jointly inspected at the completion of the *works* and as required by the *Project Manager* during the course of the *works*. The *Contractor* makes good any damage caused by the *Contractor* to the Sites and any Site working *works* areas.

WI 205.3 Site Ground Investigations

- (1) To the extent the *Employer* provides the *Contractor* with a ground investigation report which gives indicative details of the existing Site ground and sub-surface conditions, the *Contractor* undertakes all such investigations and tests as would be reasonably expected from a competent contractor to verify the accuracy of such report in respect of the *Contractor's* proposed means of working.
- (2) In addition to any Site investigation reports provided by the *Employer* the *Contractor* is deemed to have carried out any further investigations as necessary in order to gain a complete understanding of the physical conditions and the sub-surface conditions of the Sites and the *Employer* entertains no claims from the *Contractor* arising from a want of knowledge on the part of the *Contractor* in this respect.
- (3) The *Contractor* assesses all physical constraints associated with the Sites including without limitation, accessibility, surroundings, storage space for materials including all additional handling and transporting and the nature of the ground. The *Employer* is not responsible for any failure by the *Contractor* to properly assess the physical constraints associated with the Site.

WI 205.4 Use of the Site

- (1) The *Contractor* only uses the Sites for the execution of the *works*.
- (2) The *Contractor* limits his operations to within the *boundaries of the site* as shown in the Site Information.
- (3) The *Contractor* ensures that the Sites are used in a manner that is in strict



compliance with the requirements of the Working on the Railway Manual (“WoRM”), where and to the extent that the *works* are governed by the WoRM because of their proximity to the operational railway.

WI 205.5 Noise and Vibration

- (1) The *Contractor* ensures that all necessary noise reduction measures are implemented either directly to plant or temporarily to ensure boundary noise levels are minimised and any limitations are not contravened. The maximum noise levels allowable at the site boundary at specific times of the day and days of the week may vary and the *Contractor* is responsible for ascertain such levels and for not exceeding same.
- (2) The *Contractor* outlines within his method statement the measures that he will take to ensure that all noise limitations are met.
- (3) The *Contractor* takes all measures to reduce vibration and noise arising from Site operations to a minimum. Compressors are to be fully silenced models fitted with effective exhaust silencers and acoustic covers, all to the design of the compressor manufacturers and with acoustic screens in addition. Pneumatic percussive tools are to be fitted with silencers of a type recommended by the tool manufacturers. Compressors, tools, silencers and other contrivances are maintained in good and efficient working order and are not to be altered in a manner that would increase the noise of operation.
- (4) The *Contractor* follows the recommendations of the **The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015**, and the British Standard Code of Practice for Noise Control on Construction and Open Sites, BS5228, Parts 1 and 2, incorporating any amendments and any requirements of the Environmental Health and Planning Department.
- (5) The *Contractor* ensures that no unwanted or damaging vibration is transferred to any adjacent structures or buildings or to retained structures within the Sites.

WI 205.6 Electrical Interference

- (1) The *Contractor* takes all necessary precautions to avoid excessive electromagnetic disturbance of apparatus outside the Sites. The *Contractor* ensures that all electrical equipment and plant is suppressed so as to cause no unacceptable electrical or other interference to surrounding properties.
- (2) The *Contractor* takes measurements of existing electrical interference to establish a baseline prior to commencement of any *works* on the Site. Any increase in electrical interference caused by the *Contractors* equipment is established and notified to the *Project Manager* prior to its use

WI 205.7 Temperature and humidity levels

- (1) The *Contractor* maintains an even temperature and humidity where required for the proper execution of the *works*. The *Contractor* repairs and makes good any damage by his failing to comply with this requirement.

WI 205.8 Parking

- (1) There is no/limited parking at the Site.



- (2) Car parking in the local area including adjacent roads is limited and the *Contractor* is encouraged to recommend public transport to their workers.

WI 205.9 Deliveries to the Sites

- (1) The *Contractor* is bound by the load and size of vehicles allowed in this area of London at various times of the day and week and is responsible for establishing any restrictions on same and the effect this has on the carrying out of the *works*.

WI 205.10 Reservation of Rights to Use of Site by *Employer*

- (1) The *Employer* reserves the right to allow access to the Sites by the *Employer's* Franchisee and to use the Site or any portion thereof for the execution of work by the Franchisee or its *Contractors* where such work is deemed necessary by the *Employer* as necessary for the safe running of the Docklands Light Railway. The *Contractor* recovers any additional cost reasonably incurred arising from the *Employer* exercising his right herein.
- (2) The *Employer* reserves the right to use the Sites or any portion thereof for the execution of any work or storage of materials not included in this contract which may be carried out by Others provided the *Employer* shall not cause any unreasonable interference with the *Contractor* and/or with the execution of the works.
- (3) The *Contractor* allows all reasonable access and facilities for the execution of such work but is not required to provide any plant or materials except by special arrangement and will hand over sections of the *works* as and when its reasonable to enable such work to proceed.
- (4) The *Contractor* affords facilities to the *Employer*, and/or any other persons authorised by the *Employer* onto the Sites so that this work may proceed simultaneously with the progress of the works.
- (5) The above reservations of rights do not relieve the *Contractor* of any of his obligations under the Contract.

WI 205.11 Control of Water

- (1) The *Contractor* undertakes all dewatering on or about the Sites necessary for the proper carrying out of the *works* regardless of nature of water ingress.

WI 205.12 Site Rules

- (1) The *Contractor* proposes site rules for agreement by the *Project Manager* and ensures that all persons for whom the *Contractor* is responsible abide by same. The Site rules shall as a minimum address;
 - (i) Observance and compliance with all Sites signage
 - (ii) Designated pedestrian route throughout the Sites
 - (iii) Reporting all unsafe acts or situations
 - (iv) Reporting all accidents, however minor
 - (v) Alcohol, drugs or other intoxicants whilst on Sites
 - (vi) Horseplay or become involved in fighting whilst on Sites



- (vii) Knives, firearms or other offensive weapons on the Sites
 - (viii) Use of incorrect or faulty plant, tools and equipment.
 - (ix) Not operating plant or equipment without proper training.
 - (x) CITB Certification
 - (xi) Use radios or personal stereo systems whilst on Sites.
 - (xii) Compliance with dress code appropriate to Sites and DLR environment.
- (2) The *Contractor* provides for each of his site staff and operatives, including any sub-contractors, to undergo a site-specific induction prior to starting work on Sites.
- WI 205.13 Proximity to operational track
- (1) The *Contractor* constructs the *works* in such a way as to ensure that work which may be required to be carried out in close proximity of the railway is undertaken during engineering hours. Engineering hours are defined as
- (i) 01.30 to 04.30hrs Tuesday to Saturday
 - (ii) 01.30 to 05.30hrs Sunday
 - (iii) 00.30 to 04.30 hrs Monday
- WI 205.14 Site Compound
- (1) The *Employer* does not offer an area for a compound.
- WI 205.15 **Crossrail Footbridge**
- (1) The footbridge connecting the ExCeL Exhibition Centre to the new Crossrail station is a public right of way. This public right of way has to be kept open at all times. Refer to Site Information for further details.
- (2) The footbridge connecting the DLR Custom House Station to the ExCeL Exhibition Centre is to be kept clear, unhindered and open at all times. Refer to Site Information for further details.
- WI 205.16 Existing Station Facilities
- (1) Not Used
- WI 210 Constraints Associated with Time**
- WI 210.1 Time Restrictions
- (1) The starting date, access date, Key Dates and the Completion Dates represent the principle constraints on the order and timing of the *Contractor's* operations.
- (2) When working behind a hoarding there are no restrictions to working hours provided the *Contractor* ensures that the stations and the railway remain operational at all times, there is no interface with passengers and the *Contractor* complies with all other requirements of this Works Information and the Working on the Railway Manual.
- (3) For all works or deliveries which are not undertaken behind a hoarding the



works must be undertaken during engineering hours as follows:

Engineering Hours

Sunday	0130 hrs – 0530 hrs	Total 4 hours
Monday	0030 hrs – 0430 hrs	Total 4 hours
Tuesday – Saturday	0130 hrs – 0430 hrs	Total 3 hours

The timetable in the table above sets out the maximum durations in which the site will be available to the Contractor for work during engineering hours. The Contractor shall allow adequate time for complying with the requirements of the WoRM in regards to signing on with the Infrastructure Access Controller (IAC) at the Poplar station and with returning to the sites. The Contractor shall allow for and have due regard to the fact that there will other operatives also signing on with the IAC at Poplar. No claims for additional time or additional money arising from delay in accessing the sites due to the signing on procedures will be entertained.

Notice periods required from the *Contractor* for engineering hours possession is 5 weeks

- (4) The *Contractor* satisfies himself with regard to any limitations on hours of working and/or the carrying out of noisy operations at the Site that may be imposed on him by law or by a relevant authority or otherwise and the Contractor allows for the cost and programme implications of any such limitations.
- (5) The *Contractor* shall allow adequate time for complying with the requirements of the WoRM in regards to signing on with the Infrastructure Access Controller (IAC) at the Poplar station and with returning to the sites. The Contractor shall allow for and have due regard to the fact that there will other operatives also signing on with the IAC at Poplar. No claims for additional time or additional money arising from delay in accessing the sites due to the signing on procedures will be entertained.
- (6) The Contractor establishes and is aware of restrictions on working hours imposed by the local authority. The inability by the Contractor to obtain agreement from the relevant local authority in respect of working hours is not a compensation event reason for delay or additional expense.
- (7) Any work executed during overtime working at the Site and for which reasonable notice has not been given to the *Project Manager* is not covered up until the *Employer* has inspected it. Any work which is covered up without the *Project Manager* having reasonable opportunity to inspect is exposed by the *Contractor* for inspection at no cost to the *Employer*.
- (8) Overtime on the *Site* is subject to the prior written approval from the *Project Manager* who has sole discretion in respect of such approval. Approval for any



overtime working is on the basis such overtime is not to be at any additional cost to the *Employer* and that any additional cost incurred by the *Employer* by the *Contractor*.

- (9) Refusal to sanction overtime at the Site is not a compensation reason for delay or additional expense.

WI 215 Constraints associated with adjoining infrastructures

WI 215.1 Public and Private Roads

- (1) The *Contractor* maintains all roads paths and paving highways and areas adjacent thereto leading to and from the Site free from dust, debris, mud and stones arising from the works. The *Contractor* ensures that loose material, mud and debris are not dropped from vehicles entering or leaving the Sites.
- (2) The *Contractor* keeps all areas of the site affected by the *works* and all public highways, footpaths and other areas so affected, free of dirt and debris at all times. If such levels of cleanliness are not maintained to the reasonable satisfaction of the *Project Manager*, the *Project Manager* makes alternative arrangements for cleaning and charges this to the *Contractor*.
- (3) The *Contractor* repairs any damage he causes to the roads and paths on the site and to any public highways, bridges, footpaths, kerbs, drains, sewers or right of ways (including services drains and sewers). The *Contractor* indemnifies the *Employer* against any liability, loss, claim or proceedings whatsoever arising under any statute or at common law in respect of any such damage.
- (4) For the purpose of the foregoing the term “highway” means any road or footpath, on or off the Site, used by the public, together with any kerbs, gullies, sewers, street lighting, public utility services, grassed verge or tree planting associated therewith.

WI 215.2 Adjoining and Adjacent Property

- (1) The *Contractor* treats all properties adjoining and adjacent to the Sites as being occupied during the carrying out of the *works* and the *Contractor* ensures that his operations do not interfere with such properties.
- (2) The *Contractor* carries out the *works* taking all measures and precautions so as not to cause interference or interruption to the operation of the existing DLR operations except that agreed with the *Employer*.
- (3) The *Contractor* undertakes regular liaison, through the *Project Manager*, with occupants of adjacent or adjoining properties who may be materially affected by the *works* so as to keep them informed in advance of all work that may affect them.
- (4) The *Contractor* repairs any damage to adjoining and adjacent properties arising from the execution of the *works*.



- (5) The *Contractor* repairs any damage sustained to boundary walls, fences and gates, paved areas arising from the execution of the *works*.
- (6) The *Contractor* takes all precautions so as not to cause interference or interruption to the use of the adjoining and adjacent properties and land.

WI 215.3 Nuisance/Trespass

- (1) The *Contractor* prevents any public or private nuisance (including, without limitation, any nuisance caused by noxious fumes, noisy working or other interference with the rights of any adjacent or adjoining properties arising out of the carrying out of the *works*).
- (2) The *Contractor* takes all precautions to prevent disturbance, inconvenience and/or nuisance to the occupiers and users of adjoining and/or adjacent properties and to the public generally caused by noxious fumes, noisy working or other interference with the rights of any adjoining or neighbouring properties) arising out of the carrying out of the *works*. The *Contractor* executes noisy operations at such times and in such a manner as not to cause disturbance or nuisance to neighbours and adjoining and/or adjacent properties.
- (3) The *Contractor* takes all precautions to prevent his employees and those of his sub-contractors, from trespassing on adjoining and/or adjacent property.
- (4) If the *Contractor* operates any plant, machinery or equipment that projects or operates over adjoining or adjacent property or rights of way, the *Contractor* obtains the permission from the adjoining or adjacent property owner or occupier through the *Project Manager* and obtains any legal licence etc. as necessary. The *Contractor* indemnifies the *Employer* against any claim or action for damages arising from the use of any plant, machinery or equipment.

WI 216 Other Constraints

WI 216.2 Additional Constraints

- (1) SER Walkway - (Signalling Equipment Room) This walkway must remain obstruction free at all time. This walkway leads to Signalling Equipment Room/HV/plant room
- (2) Custom House Hoarding – There is currently temporary hoarding located at mezzanine level segregating the worksite from the operational station.

WI 216.2 Constraints associated with adjacent residents

- (3) The *Contractor* ensures that the carrying out of the *works* results in the minimum disruption and inconvenience being caused to adjacent residents.
- (4) The *Contractor* ensures that the carrying out of the *works* does not cause any disruption or interference to the tenants of adjacent commercial outlets.

WI 220 Constrains associated with Access Arrangements



WI 220.1 Access to the Site

- (1) The *Contractor* has visited the Sites and is familiar with all matters relating to access to the Site including all such matters that may impact on the execution and completion of the *works*.
- (2) The *Contractor* complies with all requirements and restrictions concerning access to the Sites as may be notified to the *Contractor* from time to time by the *Project Manager*.
- (3) The *Contractor* gives the *Employer* and the *Project Manager* access to the Sites and to any areas off-site where work is being performed in relation to the *works* as required by the *Employer* and/or the *Project Manager*.
- (5) When working in a substation a person with a 'Limitation of Access' permit must be present at all times.

WI 220.2 Access within the Railway Environment.

- (1) Access to the the Site is governed by the Working on the Railway Manual ("**WoRM**"). The *Contractor* is fully aware and conversant with the provisions and requirements of the WoRM and the *Contractor* complies with the requirements of the WoRM in relation to gaining access to the Beckton Maintenance Depot and in relation to access to the Site and to working on the Site.
- (2) The *Contractor* provides all method statements, risk assessments, and other documentation stated in the WoRM as being required for access to and working on the Site.
- (3) The *Contractor's* operatives and his sub-contractors are in possession of all passes and training as are required for them to access and to work on the Site.

WI 235 Security and Protection of the Sites

WI 235.1 Security

- (1) The *Contractor* familiarises himself and is aware of any existing security arrangements associated with the stations and the *Contractor* co-operates fully with same.
- (2) The *Contractor* provides his own security at the Sites for the safekeeping of the Site, the *works* and for the *Contractor's* own materials, plant and equipment. The *Project Manager* does not entertain any claims in respect of loss or damage to the *works*, materials, plant or equipment arising from a lack of security being provided by the *Contractor*. The *Contractor* ensures that the security of adjoining or adjacent properties shall not in any way be impaired due to the *works*. The *Contractor* indemnifies the *Employer* against any claims arising from same.



- (3) The *Contractor* ensures that the security of adjoining or adjacent properties shall not in any way be impaired due to the *works*. The *Contractor* indemnifies the *Employer* against any claims arising from same.

WI 240 Traffic Management

WI 240.1 Traffic Management Implementation

- (1) The *Contractor* implements a traffic management control procedure in agreement with the *Project Manager* (this may also require agreement from Others) in relation to the Site. The traffic control procedure shall without limitation include for:

- No queuing on any of the roads surrounding the Sites.
- No impact on access to residential and commercial premises neighbouring the Site.
- No queuing which may interfere with the use of the adjacent operations by others.
- All vehicles to be checked and logged upon entering and leaving the Sites and a record taken of their contents
- No vehicles will be left unattended
- All vehicle engines to be switched off whilst unloading
- Any vehicle reversing on Sites must have a banksman in attendance
- Any vehicle removing loose rubbish or debris from the Sites must have the load fully sheeted

The above list is not meant to be exhaustive, but serves to illustrate that the *Contractor* must closely control all traffic movements to ensure that a safe working environment is achieved and that any disruption or nuisance is kept to the absolute minimum.

WI 245 Condition Survey

WI 245.1 Condition Survey

- (1) The *Project Manager* and the *Contractor* agree a condition survey of adjoining and adjacent properties that may be affected by the *works*.

WI 255 Consideration of Others

WI 255.1 Considerate Constructors Scheme

- (1) The *Contractor* is a member of the Considerate Constructors Scheme and ensure all operatives and subcontractors operate in compliance with this scheme.

WI 260 Site Cleanliness



WI 260.1 Removal of Rubbish

- (1) The *Contractor* removes all rubbish from the Sites on a regular basis and keeps the Sites clean and tidy to the reasonable satisfaction of the *Project Manager*.
- (2) The *Contractor* complies with the Environmental Protection Act 1990 regarding the disposal of waste and rubbish from the Site.
- (3) The *Contractor* removes all surplus hazardous materials and rubbish from the Sites on a regular basis in accordance with the relevant regulations for same. All waste transfer documentation is retained on Sites and made available to the *Project Manager* on request.
- (4) If the *Contractor* fails to clear rubbish, waste materials or debris within 24 hours notice from the *Project Manager*, the *Project Manager* organises the clearance thereof and the cost of same is deducted from the *Contractor's* account.
- (5) The *Contractor* ensures the risk of vermin infestation is minimised by adequate arrangements for disposal of food or other waste or materials attractive to pests. If vermin infestation occurs because of the *Contractor*, the *Contractor* takes such action as the *Project Manager* instructs at no cost to the *Employer*.
- (6) The *Contractor* ensures that all holes, excavation pits, manholes, drains, etc. are covered up and sealed after each working day, including replacement of manhole covers to prevent the escape of vermin
- (7) The *Contractor* considers ways of recycling demolished materials to minimise the impact on the environment. Details are included by the *Contractor* in the Environmental Management Plan.

WI 260.2 Cleaning of the Works

- (1) On completion of the *works* the *Contractor* hands over the *works* in a clean and acceptable condition to the approval of the *Project Manager* including removing all debris and rubbish off Sites.

WI 300 DESIGN**WI 305 The Contractor's Design Responsibility (Clause 21)**

WI 305.1 Employer's Design of the works

- (1) The *Employer* does not design the *works*.

WI 305.2 Contractors Design of the Works

- (1) The *Contractor* designs the Works in accordance with the Employer's Requirements.
- (2) The *Contractor* is the principal and sole designer for this project in accordance with clause Z28 (Single Point Design Responsibility) and the information



contained within Contract Data Part 1. The *Contractor* accepts any design supplied by the *Employer* as his own, develops and rectifies as required to achieve a construction issue design that is compliant with relevant DLR and European Standards.

- (3) The *Contractor* is responsible for developing the *Employer's* Requirements and any designs contained therein to a fully detailed and coordinated design that complies with and that satisfies the *Employer's* requirements.
- (4) For the avoidance of doubt the *Contractor* is responsible for the entire design including provision of Assurance and compliance submission(s) for the whole of the *works*. The *Contractor* is responsible for the design of all Equipment together with installation and operation methodology, notwithstanding that designs of certain Equipment (such as excavation propping and other temporary works arrangements) may be included in the *Employer's* Design Information.
- (5) The *Contractor* is required to optimise the design that provides the safest, economic and efficient design to be constructed, operated and maintained throughout the project lifecycle.
- (6) The *Employer* shall not be liable to the *Contractor* (whether in Contract, tort, or otherwise) in respect of any inaccuracy, error, omission, unfitness for purpose, defect or inadequacy of any kind whatsoever in any of the design information or data provided to the *Contractor*.
- (7) The *Contractor* shall be responsible for obtaining any consents, waivers, approvals which may be required from the design stakeholders which are the *Employer* and Keolis Amey Docklands (KAD) in relation to any of the design obligations of the *Contractor* and provide any evidence necessary for the purposes of the review process.
- (8) The *Contractor* develops the design to achieve compliance with Standards and that can be built, operated, maintained (see Site information) economically, safely without adverse impact on health and performance.
- (9) The design requirements for the *Contractors* design are more fully described in Works Information WI 2000.
- (10) The *Contractor* is responsible for the management, co-ordination, liaison, integration and delivery for the entire design for the *works* and with others.
- (11) The *Contractor* is responsible for the design of all Plant and Materials for the *works* together with installation and operation methodology. The *Contractor* is also responsible for integrating and coordinating those elements of the *works* designed by others.
- (12) The *Contractor* ensures that construction does not start on any elements of the *works* without satisfying the relevant approval process and until the design is accepted by the *Project Manager*.
- (13) The *Contractor* ensures and demonstrates that his designers have been assessed and are suitably qualified and competent to carry out the design and

are reviewed throughout the design process.

- (14) The *Contractor* is responsible for managing the design interfaces with assets and structures affected by the *works* either directly or indirectly.
- (15) The *Contractor* shall ensure that the structural integrity of all existing structural members carrying altered or new loads is assessed.
- (16) The *Contractor* shall survey all existing structure and infrastructure which is to be retained and ensure they are retained in the same position, an example being the coping stones and tracks.
- (17) The design of any hoarding shall be sufficient to resist all anticipated loadings and shall include any special requirements required of the TfL as appropriate.
- (18) The *Contractor's* design satisfies all of the *Employer's* design acceptance requirements identified in WI 2000. The *Contractor's* is deemed to be aware of such design acceptance requirements and has taken account of the same.
- (19) Other than the design carried out by the Employer under WI 305.1 the *Contractor* shall provide all design services and the preparation of all drawings, models and calculations necessary for the construction, installation, testing and commissioning of the various systems and maintenance. The *Contractor* shall be responsible for the design of all aspects of the *Works* required by this Contract including production of the drawings to execute the *Works*. Where appropriate, risk assessments shall be undertaken to arrive at the appropriate design decisions.
- (20) With his tender the *Contractor* shall provide details of all subcontractors he proposes to use in all disciplines. No design subcontractors, including checking engineers, shall be employed by the *Contractor* unless they have first been approved by the *Project Manager*.
- (21) Design calculations shall be neat, clearly legible and concise. All design calculations and drawings shall remain the property of the Employer.

WI 305.3 Contractor's Design of Temporary Works

- (1) The *Contractor* is responsible for the design and submission of all details for all temporary *works* (including scaffolding) required for the works.
- (2) The *Contractor* submits the design and all relevant calculations to the *Project Manager* at least four weeks before proposed installation/erection for review before obtaining approval as per the DLR CAP (Change Assurance Panel) process.
- (3) The *Contractor* does not commence any temporary *works* without written approval of the *Project Manager*. For the avoidance of doubt approval by the *Project Manager* of any temporary works, (including scaffolding), is not acceptance by the *Project Manager* as to the suitability or otherwise of any temporary *works* or scaffolding.
- (4) The *Contractor* is responsible for the design and Assurance for all enabling and



temporary *works* required for construction of the works. The *Contractor* ensures that sufficient competent temporary *works* engineers are deployed on site to change and verify that all temporary *works* comply with the design prior to loading.

- (5) The *Contractor* shall ensure that possessions and activities carried out in engineering hours are in accordance with the current Working on the Railway Manual, as may be amended from time to time.
- (6) The *Contractor* shall protect workers from the live track(s) and protect the live track(s) from construction activity including known and accidental loads.
- (7) The *Contractor* shall provide lifting facilities as required to execute the Contract Works.
- (8) Where the *Contractor* is carrying out lifting operations using cranes, all such operations shall be carried out in accordance with the relevant standards.
- (9) The *Contractor* shall obtain approvals for crane over sailing, including when over sailing third parties.

WI 305.4 Design Checks and Approvals

For all design undertaken by the *Contractor*, the *Contractor* submits details of designs carried out in respect of the works and the Equipment including relevant design and check certificates, to the *Project Manager* for acceptance.

WI 305.5 Design for the Works

- (1) Within two weeks of the *starting date* the *Contractor's* Design Manager prepares the following design assurance plan, in consultation with the *Project Manager*:
 - A detailed design programme consistent with the programme to be submitted for acceptance, showing the planned order and timing of the *Contractor's* design activities including the various stages involved with the preparation of the design documentation for construction through to completion of "as-built" records. This programme includes provision for all reviews required under the contract, for design, design development, design checks, certification, and for obtaining and obtaining design consents and third party technical approvals as appropriate, and providing Assurance. The *Contractor* allows sufficient time in his Programme for any re-submissions that may be necessary to obtain acceptance or consent or approval as the case may be;
 - A schedule of all Assurance deliverables commencing with the design elements of the *Contractor's* Project Assurance Plan;
 - A list of all design deliverables including all drawings, specifications and other design data which the *Contractor* intends to produce together with the dates by which the *Contractor* plans to complete each deliverable identified in the list;
 - A list of the names of the *Contractor's* key design staff and specialist designers and Subcontractors, and evidence of their competence to



undertake the design work, and identifying those with delegated authority to certify the *Contractor's* design;

- A list of the names of independent checker's key staff and evidence of their competence to undertake the checking, and identifying those with delegated authority to sign-off check certificates; A list of all consents and approvals for the *Contractor's* design required from the *Project Manager* and Others including technical approval bodies;
- The quality plans and procedures applicable to the *Contractor's* design and checking activities, including describing the interfaces between the *Contractor's* designers, the *Contractor's* Design Manager and the Design Liaison Manager; and

Procedures for design progress monitoring and reporting, design change control and design risk management.

WI 305.6 Design of Equipment

- (1) Within two weeks of the starting date and before commencing any design of Equipment, the *Contractor* submits to the *Project Manager* a list of items of Equipment for which the *Contractor* intends to prepare designs, and the proposed checking categories.
- (2) In preparing this list the *Contractor* identifies the potential for risk, together with any third party approvals that may be required (e.g. highway authorities and Statutory Undertakers).
- (3) The *Contractor* also submits, to the *Project Manager* for acceptance, the schedule of design interfaces between Equipment and the *works* and settlement control, identifying which party within the design organisation is responsible for the design and checking of each aspect of design.
- (4) The *Project Manager* instructs the *Contractor* as to those items of Equipment for which the *Project Manager* will require submission of the *Contractor's* design data.
- (5) The design and check of any item of Equipment is undertaken by competent qualified persons and, where appropriate, the *Contractor* appoints a Temporary Works Coordinator, who will undertake the duties and role described as Falsework Co-ordinator in BS: 5975.
- (6) Unless the *Project Manager* allows it to be left in the *works*, the *Contractor* removes all Equipment when it is no longer needed, in such manner as to prevent damage to the *works*. The *Contractor's* design of Equipment takes account of this requirement.

WI 305.7 Design Warranty of the works

- (1) The *Contractor* warrants that the works are designed to continue in service assuming normal usage and maintenance to provide a design life in accordance with Engineering Standard DLR-ENG-STD-ES-502. The *Contractor* shall ensure that no major repairs, modification is required arising from an inadequacy in the

design.

- (2) The *Contractor* shall use the level of skill care and diligence specified by clause 15.7(b) to ensure that the completed design for the *Works* shall comply with the requirements of the *Employer's Requirements*.
- (3) The *Contractor* shall, in designing the *Works*, use reasonable skill care and diligence and shall have the like liability of an appropriate designer experienced in carrying out design *works* for projects of similar size and complexity as the *Works*.
- (4) The *Contractor* shall submit appropriate review and check certificates with Design Documentation submitted, as directed by the Project Manager.
- (5) The *Contractor* provides a warranty for all hardware equipment supplied as part of the *works*. The warranty shall be effective for a period that is usual in the market for this environment from the date of final acceptance of such hardware warrants everything needed to correct any defect in the hardware equipment.
- (6) The *Contractor* provides a warranty that warrants all software provided by the *Contractor*. The warranty provides cover that is usual in the market for the software provided.

WI 310 Design Process

- (1) All design for the *Works* shall be developed through standards and assurance process. The *Employer* will provide the *Contractor* with the native source files for all drawings.
- (2) The *Contractor* provides a Design Management Plan.
- (3) The *Contractor* provides complete supporting information and obtains the *Project Manager's* written acceptance for any concessions from the *Employer's Requirements* and Standards required for the *Contractor's* design of the *works*.
- (4) The *Contractor* confirms compliance with, and, as necessary, make cross references to, the *Employer's Requirements* and Standards and any other relevant *Works Information*.
- (5) The *Contractor* provides Assurance and a compliance submission statement in timely fashion in respect of the design. The *Contractor* fulfils the designer's duties under the Construction (Design & Management) Regulations 2015 and provides all design information for the preparation of the Health & Safety File as required by the *Project Manager*.
- (6) The *Contractor* prepares working drawings, design calculations, specifications, safe system of works and any other relevant information necessary to Provide the *Works*.
- (7) The *Contractor* obtains all required design checks and third party technical approvals from the *Employer* and Keolis Amey Docklands (KAD) and carries out any reworking of the design necessary in order to obtain these approvals.



- (8) The *Contractor* provides design certificates and check certificates.
- (9) The *Contractor* is responsible for co-ordination, systems integration and quality control of the *Contractor's* design and its integration with other parts of the *works* whether designed by the *Contractor* or not.
- (10) The *Contractor* obtains the acceptance of the *Project Manager* to any changes which arise on Site and vary the *Contractor's* design, which has been already been accepted by the *Project Manager*, or vary designs prepared by Others and contained in the *Employer's* Design Information.
- (11) The *Contractor* prepares and provides soft copies and hard copies of "as-built" drawings and operation and maintenance manuals to suit the progressive completion of the *works*.
- (12) The *Contractor* complies with the quality plans and procedures and ensures that the *Project Manager* is kept informed of the *Contractor's* progress at all stages during the preparation of *Contractor's* design.
- (13) The *Contractor* makes presentations and reviews of the developing design to the *Employer* and Others as appropriate and/or as reasonably required by the *Employer*.
- (14) Under the DLRL Change Assurance Framework the *Employer has* progressed the design through the Change Assurance Panel Gates for the Notification of Change (NoC) which has been approved under the Operational Asset Change Category. The *Contractor* shall develop the design to the following Change Assurance Panel (CAP) Gates; Acceptance in Principle (AiP) Acceptance of Design (AoD), followed by Acceptance of Asset (AoA) and concluded with the Closure of Change (CoC) CAP gate. The *Contractor* shall provide all necessary documentation required by CAP in order to obtain assurance to progress to the next stage gate.
- (15) The *Contractor* shall only commence construction of the design or parts thereof once the design or such parts have passed the Acceptance of Design assurance gate.
- (16) The *Contractor* notes that Change Assurance Panel meetings take place fortnightly.
- (17) The *Contractor* provides the *Project Manager* with the design along with all the relevant documentation identified in the Master Document List for the assurance gate. The Master Document List, which requires updating throughout the change assurance process, is included in WI 2000.

WI 315 Design Submission and Acceptance

WI 315.1 Design Submission.



- (1) The *Contractor* submits two copies of his design(s) to the *Project Manager* for acceptance. The *Contractor* makes a presentation for each element package of data submitted for review and gives no less than four weeks' notice of the intended submission date.
- (2) The *Contractor* provides the *Employer* and Others 20 working days to review the design. The *Contractor* allows for at least two iterations of review in his programme. The *Employer* reviews and comments on the Contractor's Design and returns his comments in accordance with the *Employer's* review process.
- (3) All Design documentation submitted by the *Contractor* to the *Employer* for review contains sufficient detail and is accompanied by sufficient information to enable the *Project Manager* to reasonably to assess whether the Contractor's design satisfies the *Employer's* Requirements, the Contractor's Works Proposals and does not contain a Safety Issue.
- (4) Where revised Design documentation is submitted, the *Contractor* shall also ensure that the documents clearly identify the revision made.
- (5) The *Contractor* provides the design of the *works* or of the relevant parts of the *works* to the *Project Manager* for comment and acceptance at least five weeks before the proposed installation/erection of the *works* or of the relevant part of the *works*. For the avoidance of doubt comment and/or acceptance by the *Project Manager* of the *works* or of any part of the *works* does not constitute acceptance by the *Project Manager* as to the suitability or the *Contractor's* design is not a waiver or does not relieve the *Contractor* of his design responsibilities and obligations in respect of his design.

WI 320 Construction Information

- (1) The *Contractor's* Submissions are staged in accordance with the Accepted Programme. The *Contractor* includes all relevant information in the design particulars, including:
 - Drawings
 - Specifications
 - Safe system of works
 - Assessment reports
 - Design certificates
 - Check certificates
 - Designer's risk assessments
 - Design calculations
 - Confirmation that the *Contractor* has obtained the third party approvals for which he is responsible.

WI 325 Project Manager's Acceptance

- (1) The *Contractor* constructs the *works* in accordance with the design which has been accepted by the *Project Manager*. The *Project Manager* reviews any *Contractor* submitted design data for compliance with the *Employer's Requirements*.
- (2) Any re-working of the design, which is necessary, in order to obtain the *Project Manager's* acceptance is undertaken by the *Contractor* before commencing construction of that element or elements of the *works* affected.
- (3) In accordance with the provisions of clause 21 of the *conditions of contract*, the categories of acceptance are as follows:
 - a) Accepted without comment
The *Contractor* adheres to the design which the *Project Manager* has accepted and construction proceeds.
 - b) Accepted with comments
The *Contractor* reviews and incorporates the *Project Manager's* comments in his design and construction proceeds.

If the *Contractor* does not incorporate the *Project Manager's* comments, the *Contractor* justifies the reasons for not agreeing, in detail, to the *Project Manager*. The *Contractor* then resubmits the design to the *Project Manager* for acceptance.

Construction does not proceed unless the submission has been accepted by the *Project Manager* in accordance with clause 21 of the *conditions of contract*.
 - c) Rejected
The *Project Manager* gives reasons for rejecting the design submitted.
Construction does not proceed.
The design is revised by the *Contractor* and resubmitted.
 - d) No review required to be undertaken
The *Contractor* adheres to the design which the *Project Manager* has not reviewed and construction proceeds.

WI 330 Design approvals from Others (27.1)

WI 330.1 Keolis Amey Docklands (KAD).



- (1) The *Contractor* is aware that Keolis Amey Docklands Ltd (KAD) has an input to the approval of the *Contractor's* design and the *Contractor* shall allow for the impact of this in his price and programme for the *works* as stated in WI 315.1

WI 335 Employer's Requirements

- (1) The *Employer's* Requirements are contained in the *Employer's* Design and/or as reasonably inferred from such *Employer's* Design in the WI2000. To the extent the *Contractor* undertakes any design such design satisfies and complies with all of the *Employer's* Requirements contained or reasonable inferred therein
- (2) Where and to the extent the *Contractor's* design does not satisfy or comply with the *Employer's* Requirements, the *Contractor* at no cost to the *Employer* amends his design such that in the reasonable opinion of the *Project Manager* or otherwise as may be instructed by the *Project Manager*, the *Contractor's* design satisfies and complies with the *Employer's* requirements.

WI 340 Change to Employer's Design

WI 340.1 Contractor's design change proposals

- (1) For the purpose of this clause a *Contractor's* design change proposal means a proposal made by the *Contractor*, before proceeding with the relevant work, to change the design which is contained in the *Employer's* Design, or which has previously been accepted by the *Project Manager*.
- (2) If the *Contractor* wishes to propose such a change he submits the relevant design data to the *Project Manager* for acceptance, with an explanation of the reasons for the proposed change together with an assessment of the cost and programme effects.
- (3) Except as may be agreed between the *Project Manager* and *Contractor*, the period for reply for the assessment of the *Contractor's* submission to change the design shall be four weeks.
- (4) The *Contractor* submits the following information with any alternative design proposal:
 - Outline drawings of his proposed scheme;
 - Outline construction safe system of work with safety risk assessment;
 - Summary of changes from the *Employer's* Design;
 - Proposed design check category of the structure;
 - List of third party approvals required for the alternative design proposal;



- Outline programme for design, liaison, checking, consents, *Project Manager's* review and construction; and
 - Proposed design and checking bodies.
- (5) The *Contractor* is responsible for co-ordination of the design and its integration with other parts of the works not designed by the *Contractor*. This may involve regular liaison and formal reviews on all aspects of the design with the *Employer's* other designers.
- (6) Design change proposals (including drawings and specifications) are subject to formal review by the *Project Manager*.
- (7) The *Contractor* takes account of the *Project Manager's* and the *Employer's* costs incurred in review and acceptance of the proposed change. The *Contractor* is also responsible for management of the programme to ensure that the process of revisions to the design does not impact on the Completion Date or on any other Key Date.
- (8) The *Project Manager* may agree a phased submission programme to facilitate development of the assured design and to mitigate delays in the construction programme.

WI 345 Records

- (1) The *Contractor* maintains a log of all proposed design changes sufficient to track the relevant correspondence, design particulars, and cost and programme impacts of each design change.

WI 350 Cost saving proposals

- (1) The *Contractor* may identify opportunities for cost saving proposals, notifies the *Project Manager* and undertakes to chair and manage a cost saving meeting. The meeting is attended by key personnel to review the proposals and the beneficial output to the contract. The *Project Manager* reserves the right to refuse any output of the cost saving process, where this leads to a change in scope. The *Project Manager* reserves the right to instruct the output of a cost saving exercise as a change to the Works Information, if it constitutes a change in scope.

WI 355 Design co-ordination

- (1) The *Contractor* ensures that his design is progressed in a logical sequence and that all elements of the design are co-ordinated with each other.

WI 360 Requirements of Others

- (1) To the extent the *Contractor* undertakes design, the *Contractor* ensures that the design has full and due regard for the requirements of Others as may be set out



in this Works Information and/or as may be notified to the Contractor by the *Employer* from time to time.

WI 365 Asset Information Capture

- (1) The *Contractor* completes Asset Capture Forms for all new assets installed as part of the *works*.

WI 370 Building Information Modelling

- (1) The *Employer* utilises Building Information Modelling (BIM) in its business and the *Contractor* provides all as-built and record information as required and in such a format as the *Employer* reasonably requires to support the BIM. A copy of the BIM Protocol and other relevant information is included at Annexure 1

WI 400 COMPLETION

WI 405 Completion definition 11.2(2)

WI 405.1 Definition

- (1) In addition to and without prejudice to clause 11.2(2) of the contract, Completion of the *works* is when the *Contractor* has:
 - Rectified all defects which would prevent or restrict safe operation and/or opening of the works for passenger use.
 - Completed Testing and Commissioning of all systems in accordance with WI 700 and accepted by the Franchisee (KAD).
 - Cleared the Sites and the compound and removed everything including surplus Plant & Materials and Equipment from the Site area to enable safe operation of the *works* to the reasonable satisfaction of the *Project Manager*.
 - Provided the *Project Manager* with final copies of the approved Operational and Maintenance Manuals.
 - Provided a Health & Safety file acceptable to the *Project Manager*.
 - Provided the as-built information to the satisfaction of the *Project Manager*.
 - Provided all deliverables required under the Contract.

WI 405.2 Notice requirements

- (1) The *Contractor* provides the *Project Manager* no less than four weeks notice of the date that the *Contractor* plans to achieve Completion.

WI 405.3 Work to be done by the Completion Date

Without limitation to the provisions in the *conditions of contract*, the *Project Manager* does not certify completion unless the below activities have take place. The *Contractor* shall, by the *Completion Date* for the whole of the *works* ensure the following:

- Completion of the *works* in accordance with the Works Information;
- The *works* have been assured in accordance with WI 600;
- Operations and Maintenance (O&M) manuals and warranties in accordance with WI 600 have been provided by the *Contractor* and accepted by the *Project Manager*;
- All testing, inspections and commissioning has been witnessed by the *Project Manager* and/or the *Supervisor* and has been certified in accordance with WI 700 and accepted as complete by the *Project Manager*;
- Completion of the *works* necessary to facilitate a safe use of the *works* by the *Employer*.
- The Site is clear of all unused Plant and Materials, Equipment and other items to ensure free and unobstructed access by the *Employer* and Others and that a “final clean” has been undertaken;
- All temporary hoardings and barriers have been removed;
- The demobilisation of all site accommodation and welfare is complete;
- All strategic maintenance spares and tools necessary to open up and inspect the *works* delivered by the *Contractor*, accepted by the *Project Manager*, and stored by the *Employer* and correctly labelled and marked in accordance with the *conditions of contract* and Works Information assets to include those with a long lead time or are vulnerable and/or susceptible to failure or damage;
- The *Contractor’s* training of the *Employer’s* staff and Others as detailed in WI 415 has been completed;
- Provide care, protection and maintenance (as required) of all completed *works* until handover.
- Post-completion maintenance plan and asset labelling has been completed and accepted by the *Project Manager*; and
- All notified Defects have been corrected by the *Contractor*.

WI 405.5 Completion Inspections



- (1) The *Contractor*, the *Employer* and Others affected by Completion, carry out joint inspections of the works.
- (2) The *Contractor* makes provision for time to correct Defects and any necessary re-inspection following correction. The *Contractor* also allows time for updating and modifying any Completion documentation that may be required.
- (3) The *Contractor* provides the *Project Manager* with:
 - Details of inspection plans including a 2 week rolling look ahead to be carried out, required attendees including the *Employer's* representatives, Subcontractors or Others including the format for output of successful inspection/identification of Defects;
 - Details of certificates, warranties and the like and evidence that all applicable statutory or regulatory approvals have been obtained
 - Details of tests to be completed including certification requirements/test results for work covered up and provision of copies as evidence – visibility alone is not acceptable
 - Details and programme for all off site tests, Factory Acceptance Tests (FATs), in sufficient time to enable the *Project Manager* to attend such tests with reasonable notice.
 - Details of site cleanliness inspections, dust mitigation measures, removal of all temporary works, Plant and Equipment and making good for both permanent and temporary works
 - Details of identified Defects, time provision for correction of Defects, delivery of parts, materials and Equipment and updating Completion documentation as required
 - A Defect correction programme for acceptance by the *Project Manager*

WI 405.6 Completion Documentation

- (1) The *Contractor* provides the *Project Manager* for acceptance, a list of all Completion documentation in accordance with the Works Information.
- (2) Completion is not certified by the *Project Manager* unless as a minimum the following has taken place:
 - As-built drawings and design specifications have been provided and accepted by the *Project Manager*
 - All Assurance documentation has been provided and accepted by the *Project Manager* in accordance with WI 600
 - Quality records have been provided and accepted by the *Project*



Manager in accordance with WI 600

- Health and Safety files have been provided and accepted by the *Project Manager* in accordance with CDM (2015)
- Inspections, tests plans and commissioning certificates have been completed in accordance with WI 700 and accepted as completed by the *Project Manager*
- All documentation required by the Master Document List has been provided and accepted by the *Project Manager*.
- Asset information has been updated, integrity checked, provided in a format agreed and accepted by the *Project Manager*
- Non-conformance reports (NCRs) and close out activities have been provided and accepted as completed by the *Supervisor* as part of Defects management process.
- All public third party complaints recorded and resolved together with other third party liaison (party wall disputes resolved etc.)
- Meter readings of all power supplies to Site and all supplies to be taken over by the *Employer* supplied by the *Contractor* and accepted by the *Project Manager*
- All excess materials, plant and Equipment has been removed and the Sites left in a clean and tidy condition with dust mitigation measures implemented and accepted as complete by the *Project Manager*

WI 410 Sectional Completion Option X5 (Only if X5 is used)

- (1) The works are completed in the following sections:
- i. Section 1 – All works required to complete the requirements of the Works Information at Custom House Station
 - ii. Section 2 - All works required to complete the requirements of the Works Information at London City Airport Station

WI 415 Training

Not Used

WI 420 Final Clean

- (1) Prior to Completion the *Contractor* ensures that the Sites are clear of all Equipment, Plant and unused Materials and all temporary *works* and that a “builder’s final clean” has been undertaken.

**WI 425 Security**

- (1) The *Contractor* prepares a plan four weeks in advance of the Completion Date for the *Project Manager's* approval, detailing how the *Contractor* proposes to transfer the possession of the Site or part(s) thereof to the *Employer* as part of the Hand over / Handback Strategy.
- (2) The *Contractor* removes all temporary access provided by the *Contractor* before the Completion Date and secures all alterations made.

WI 430 Correcting Defects (45.1, 45.2)

- (1) Access to the site for correcting defects after Completion can only be obtained with the permission of the *Project Manager*.
- (2) All Defects notified before Completion as defined by clause 11.2 (5) of the *conditions of contract* are rectified to comply with the Works Information.
- (3) The *Contractor* complies with the defect correction period as stated in the *conditions of contract* and Contract Data. Where relevant, the *Contractor* complies with the access booking process requirements on the operational railway in order to arrange the appropriate access to the Site in order to correct the Defects.
- (4) In completing Defect correction the *Contractor* allows for:
 - All attendances required from Subcontractors, statutory authorities, utilities, the *Employer* and Others.
 - Time period for correction of Defects on Site
 - Updating as-built information, O&M manuals as required
 - Re-inspection of corrected Defects
 - Keeping records of corrected Defects and supplying these to the *Supervisor* as evidence of Defects correction in addition to site inspections.
 - The *Supervisor* issuing the Defects Certificate in accordance with clause 43 of the conditions of contract.

WI 435 Pre-Completion arrangements

- (1) The *Contractor* attends a series of pre-completion meetings with the *Project Manager* as required by the *Project Manager* prior to the planned completion of the *works* and thereafter on a weekly basis. The purpose of the meetings is for the *Contractor* to present a detailed completion programme for the *works* and to enable the *Project Manager* to ensure that all arrangements and measures are in place for a proper and complete handover of the *works* to the *Employer*.

WI 440 Contractor's Maintenance Obligations

WI440.1 Draft Operational & Maintenance Data



- (1) Not less than four weeks prior to Completion, the *Contractor* submits to the *Project Manager* for acceptance, a draft of the operation and maintenance (O&M) manual, including an outline plan for preventive maintenance, and a recommended list of spare parts holding (together the “O&M data”).
- (2) The *Project Manager* either accepts the O&M Data or notifies his non acceptance, giving reasons, within four weeks. A reason for not accepting the draft O&M data is that it is not sufficient to enable the *Employer* to accept responsibility for the maintenance of the section of *the works*.
- (3) The *Contractor* submits a list of recommended operational asset spares for the *Project Manager’s* acceptance as part of the draft O&M manual. The spare parts holding list identifies items required as a basic holding suitable for one year’s routine preventive maintenance together with identification of all long delivery components.

WI 445 Meeting post Completion

- (1) Following completion of the *works*, the *Contractor’s* attends a “Lessons Learned” meeting with the *Project Manager* and the *Employer* in order to share and review any lessons learned in the course of the execution of the *works*.

WI 450 Post Completion review meeting

- (1) The *Contractor* attend meetings during the *defects correction period* as reasonably required by the *Project Manager* having due regard to the extent of defects occurring after the Completion of the *works* to review progress, planning and implementation of correcting any such defects prior to the end of the *defects correction period*.

WI 455 Planned and Reactive maintenance

Not Used

WI 460 Maintenance records

- (1) The *Contractor* submits maintenance records to the *Project Manager* for acceptance, no less than 2 weeks prior to handover.

WI 461 Maintenance Strategy

Not Used .

WI 500 PROGRAMME REQUIREMENTS

WI 505 Programme Requirements (Clause 31.2)



- (1) The *Contractor's* programme is prepared using Primavera Enterprise Version 8.0 or later. Primavera software settings are in accordance with the Project Manager's requirements.
- (2) All Primavera calendars used are set in days. No activity shall exceed 2 week duration without prior acceptance by the Project Manager.
- (3) The *Contractor's* programmes shall show the critical path(s), early start and finish dates, late start and finish dates and total float.
- (4) Key Dates and/or Sectional Completion Dates are shown on the programme.
- (5) Interfaces and/or constraints associated with *works* by Others as identified in this Works Information are shown.
- (6) All programme submissions are clearly titled, numbered and dated
- (7) The programme allows sufficient time for the process of review, revision and further review of all drawings, documents and other things to be submitted to the *Project Manager* so that such process may be completed without delaying the placing of orders and the execution of the *works*
- (8) The *Contractor* submits the programmes in the following format:
 - The full programme in logical linked Gantt chart form showing the critical path(s), Early Start Dates, Late Start Dates and Float in hard copy and .pdf electronic file format;
 - A summary programme for each section of the *works* in linked bar chart format showing the critical path(s), sectional Completion Dates, Key Dates and other major milestones in hard copy and .pdf electronic file format; and
- (9) The full programme Primavera .xer files and .plf files by electronic data transfer. The change log is submitted with the data files and any changes to calendars particularly noted.
- (10) All programmes submitted include the information listed in clauses 31.2, and 32.1 of the *conditions of contract* as amended together with the following information:
 - The dates the *Contractor* plans to submit the survey information obtained at each station;
 - The dates when key items of Plant and Materials and Equipment are required;
 - All major milestones to Completion of the *works*;
 - The agreed dates when documents are submitted, for acceptance by the *Project Manager*, in respect of design or third party consents;
 - The dates when the *Contractor* consent submissions are made;
 - The dates of submission of any quality plans and safety plans;.
 - The dates of submission of any other programmes and safe system of



works;

- The dates of submission of any logistics plan;
- The dates of commencement of all permanent and temporary construction and installation activities;
- The dates of factory and Site inspection and tests;
- All quality hold points and quality control points;
- The dates of all necessary approvals and consents from the *Employer* or from Others.
- The dates and duration of all testing and commission activities.
- The *Contractor* shall resource load, with hours, cost and quantities the first revised programme for acceptance within 4 weeks of the starting date. The *Contractor* and the *Project Manager* shall agree on the method for resource loading of the programme, and the maintenance of the resource loading prior to the submittal of the first revised programme;
- Details of any 3rd party interfaces and/or submissions development, submission and approvals allowing sufficient time for each stage of the process and also allowances for resubmission;
- Details of any significant changes including revisions to critical path since the previous Accepted Programme.

WI 510 Programme Arrangement

- (1) The Contractor's programme is prepared with due regard to the following:
- The programme separately identifies any stages in the *works*, (for example Stage 1 Works and Stage 2 Works) as may be further described in the Works Information.
 - The programme separately identifies any optional works, as may be further described in the Works Information.
 - The programme identifies the latest date by which any stage works commencement notice are required to be issued by the *Project Manager*.
- (2) The *Contractor* develops a sub-network of the programme showing all design deliverables. This sub-network is a separate programme but which can be integrated as part of the overall programme submitted for acceptance

WI 515 Methodology Statement

- (1) The *Contractor* provides a narrative with each programme submitted for acceptance describing how the programme has been put together, with reference to the safe system of work and including:
- Cycle times and work sequences;
 - The time risk allowance against each activity;
 - The deployment of *Contractor's* Equipment and labour;



- The production rates used in determining durations;
 - The shifts assumed in determining durations;
 - The breakdown of labour requirements by trades;
 - Intended working hours
 - The schedules of quantities used in developing the programme; and
 - Time risk allowance.
- (2) The programme narrative is in sufficient detail to enable the durations, leads and lags in the logic diagram to be reconciled and substantiated, and to enable the projected levels of labour (by trade) and staff and flows of goods, Materials and Equipment to be identified.

WI 520 Work of the *Employer* and Others

- (1) Not Used

WI 525 Information Release Schedule

- (1) The *Contractor* provides the *Project Manager* with a schedule of information required from the *Project Manager* and the date by which it is to be provided. The *Contractor* ensures that any dates contained in the schedule of information to be provided are neither unreasonably close to or distant from the date when work associated with the requirement is due to be carried out.

WI 530 Revising Programmes

- (1) Revised programmes submitted by the *Contractor* for acceptance include the information listed in clause 32.1 of the *conditions of contract* together with the following information:
- change log detailing all new activities
 - changed durations
 - changed calendar assignments
 - changed dependencies.
- (2) The *Contractor* attends regular planning meetings with the *Project Manager* as reasonably required by the *Project Manager* having regard to the progress of the *works*.
- (3) The *Contractor* updates programme as reasonably required by the *Project Manager* having regard to the progress of the *works*.
- (4) The *Contractor* provides a progress report for review and discussion at the progress meetings

WI 535 Inspection, Test and Sample Schedule

- (1) The *Contractor* provides the *Project Manager* with a schedule of inspections; tests and sampling that require to be notified and co-ordinated with the

Employer.

WI600 QUALITY AND ASSURANCE

WI 605 Terminology

- (1) The following are Quality and Assurance System terms used in this section of the Works Information;

Term	Meaning
Assurance	Process of ensuring and providing evidence that the <i>works</i> have been designed and constructed in compliance with the <i>Employer's</i> Requirements
Conformity	Fulfilment of specified requirements.
<i>Contractor's</i> Project Quality and Assurance Plan	A document setting out how the quality requirements of the contract will be achieved, controlled, assured, demonstrated and managed.
Corrective Action Request (CAR)	A statement prepared to record a failure to implement a specified process or contractual requirement. Generally identified during an audit.
<i>Employer's</i> Requirements	The output from the <i>works</i> in respect of spatial and operational improvements documented in the <i>Employer's</i> Requirement in the Works Information and the applicable Standards and legislation applicable.
Handback	The process by which the <i>Contractor</i> returns into use an altered or unaltered asset where the function of the asset is not changed by the <i>Contractor's</i> occupation or alteration.
Handover	The process by which a new asset or an existing asset where the function has changed, is handed over to the <i>Employer</i> and the responsibility for maintenance after the Handover transfers to the <i>Employer</i> and is carried out on the <i>Employer's</i> behalf. Completion or take over by the <i>Employer</i> (in accordance with clause 35 of the <i>conditions of contract</i>).
Hold Point	A point in the construction of an element of the <i>works</i> at which the <i>Project Manager</i> is invited to inspect the <i>works</i> to verify quality or completeness prior to the work progressing. The <i>Project Manager</i> will identify these Hold



	Points during his review of the Inspection and Test Plans
Inspection & Test Plans (ITPs)	Plans specifying the activities required to establish how Conformity is to be verified. They identify the responsibilities for executing the activities, the documents controlling them and the records required to provide Assurance. These are prepared for a particular element of the <i>works</i> to support the <i>Contractor's</i> Project Quality and Assurance Plan.
Safe System of Work	A statement submitted in accordance with the requirements of clause 31.2 of the <i>conditions of contract</i> describing how the <i>Contractor</i> plans to do the work, and identifying the principal Equipment and resources which he plans to use.
Non Conformance Report (NCR)	A statement raised to record a Non-conformity (Defect) in the product, workmanship, or system.
Nonconformity	A Defect - as defined in clause 11.2 (5) of the <i>conditions of contract</i> . (The term "Non-conformity" is used to be consistent with industry practice and includes System Defects as defined below.)
Outstanding Work List	A list generated at an inspection or acceptance stage to identify Defects which must be remedied before an asset can be put into operational use.
Quality and Assurance System	The management system for achieving the quality requirements described in the Works Information and for demonstrating that achievement, including the provision of documentary evidence and supporting records.
Quality Control Procedures (QCPs)	Documents that specify operational techniques or activities that are used to fulfil requirements for quality, and as such support the contract quality plan.
Site Query (SQ)	A request for information, clarification or agreement to a proposed action.
System Defect	A failure to comply with the quality and Assurance management requirements specified in this Works Information.
Verification Activity Plan	Document prepared and owned by the <i>Employer</i> in accordance with LUL Standard S1538.

**WI 610 Quality Statement**

- (1) The *Contractor* undertakes the *works* in accordance with Quality Management Principals [ISO 9000] and ensures:
- achievement of all the Project objectives,
 - sustainable culture of Continuous Improvement and Innovation to correct and prevent non-conformances ,
 - Enables a robust and adequate application of Quality Management Systems [ISO 9001].

WI 615 Quality and Assurance management system

WI 615.1 Quality and Assurance Management Systems requirements

- (1) The *Contractor* provides a quality and assurance management system for approval of the *Project Manager* and is submitted within 4 weeks after contract award. The quality and assurance management system identifies how the *Contractor*, by audit, inspection, self certification, collation and provision of evidence, demonstrates that the *works* are designed and constructed in compliance with all the requirements of the contract relevant Standards and statutory regulations.
- (2) The *Contractor* submits plans and procedures for acceptance by the *Project Manager* to demonstrate how he will satisfy these requirements.
- (3) The *Contractor's* quality and Assurance documentation are set out to minimise the duplication of information between plans and procedures.

WI 615.2 Quality system requirements

- (1) The *Contractor*, his designers, Subcontractors and suppliers establish and implement quality management systems which comply with BS EN ISO 9001.
- (2) The *Contractor* provides access to his quality system documentation for review, inspection, and audit by the *Project Manager*.
- (3) Any intervention by the *Project Manager* in Hold Point inspections, and critical interventions, in audits, or in oversight of the progress of the works, does not relieve the *Contractor* of his obligations under the contract.
- (4) Quality system documentation which supports Subcontractor and supplier activities in the *works* is reviewed and accepted by the *Contractor* before work starts on the relevant activities. The contract makes the documentation available to the *Project Manager* for audit on request.
- (5) The *Employer*, the *Project Manager* and Others including statutory authorities and Statutory Undertakers have the right to observe, witness, conduct audits, inspections and tests of all *works* that are being executed by the *Contractor*, his

designers, Subcontractors, suppliers and sub-tiers thereof.

- (6) The *Contractor* provides all inspection and testing necessary to demonstrate compliance with the specified requirements. All Non-conformities are resolved before final acceptance of the whole of the *works* or any section thereof.

WI 615.3 Quality and Assurance Manager

- (1) The *Contractor* appoints a Quality and Assurance Manager to be responsible for all quality and Assurance matters on this contract. The Quality and Assurance Manager is suitably empowered and supported to enable the quality of work on the contract to be managed effectively.
- (2) The Quality and Assurance Manager is independent of the design and construction functions, and has an independent link to level. The Quality and Assurance Manager is full-time for the duration of the contract, dedicated to quality and Assurance matters on this contract, and is provided with adequate resources and authority to enable the quality of work on the contract to be managed effectively. The *Contractor* does not replace the Quality and Assurance Manager without the express written permission of the *Project Manager*.
- (3) The Quality and Assurance Manager:
 - develops and implements a Project Quality and Assurance Plan as detailed in WI625 below;
 - Ensures the *Contractor's* Quality and Assurance Plan complies with BS/150 1055.
 - develops and provides quality training for all personnel to include induction and training for staff with specific quality responsibilities;
 - manages all quality personnel;
 - approves the quality elements of the *Contractor's* Safe Systems of Work;
 - ensures compliance with legal and contractual requirements;
 - provides advice and instruction to construction teams to deal rapidly and effectively with quality non-conformities and complaints;
 - analyses individual quality non-conformities and complaints to identify trends, root causes and the corrective and preventive actions needed;
 - ensures the provision and review of ITPs;
 - undertakes audits of the *Contractor* and Subcontractors including compliance with legal and contractual requirements;
 - produces information for the Management Review with senior management, that as a minimum should comply with ISO 9001, and attend the Management Review meeting to ensure that the quality management system remains suitable, adequate and effective.; and
 - reports to the *Project Manager* on all quality issues.



- (4) The Quality and Assurance Manager has the following key competencies:
- appropriate experience of quality management and the delivery functions of the *Contractor*/supplier under self certification contracts;
 - good knowledge and practical experience of developing, implementing and improving quality management systems;
 - be a member of the Chartered Quality Institute (or an equivalent recognised quality body) or an appropriate engineering institute; and
 - be a competent auditor or have access to competent auditors.
- (5) Designers, Subcontractors, suppliers and sub-tiers thereof each provides a quality assurance representative with adequate resources and appropriate authority and competency to ensure the quality of work and deliverables on the contract
- (6) The *Employer*, the *Project Manager*, and authorised Others including statutory authorities and Statutory Undertakers, have the right to observe, witness, conduct audits, inspections and tests of all *works* that are being executed by the *Contractor*, his designers, Subcontractors and supply chain.
- (7) The *Contractor* provides all inspection and testing necessary to demonstrate that all the requirements of the Works Information and the law have been met. All non-conformities are resolved before final acceptance of the *works* or any section of the works.
- (8) All on-Site and off-Site testing is carried out by laboratories accredited by UKAS or by a similar national body or by persons accredited to a similar standard and are subject to acceptance by the *Project Manager*. The quality system provides procedures for witnessing the manufacturing, construction, installation, testing and commissioning of the works.

WI 615.4 Samples for Submission

- (1) Not Used

WI 620 Assurance management

WI 620.1 General

- (1) *Contractor* Assurance requires the *Contractor* to provide sufficient evidence to demonstrate to the *Project Manager* that the general and specific requirements of the Works Information and the Standards have been complied with
- (2) The *Project Manager* monitors Assurance by a process of planned sampling and critical intervention.
- (3) The *Contractor* monitors, inspects, audits and verifies that his suppliers and Subcontractors and all tiers supplying the suppliers and Subcontractors are providing acceptable Assurance, through procedures and evidence, in compliance with general and specific requirements and the relevant Standards

WI 620.2 Design Assurance



- (1) The *Contractor* provides Assurance to the *Project Manager*, that the proposed design is compliant with all standards and requirement of this Works Information. The *Contractor's* procedures for achieving Assurance are identified in the *Contractor's* Project Quality and Assurance Plan.
- (2) Where there is a Defect, the *Contractor* carries out such redesign as may be necessary to correct, rectify or prevent a recurrence of such Defect. Any such redesign ensures that the performance and operation of the *works* and the relevant part thereof is not degraded or reduced by virtue of such redesign from the Standards specified in the Works Information and/or in this contract or if no Standard is so specified, from the Standard reasonably inferred from this contract.
- (3) As a minimum, the design management process is documented in the *Contractor's* or Subcontractor's management system to meet the *Employer's* requirements for design.
- (4) The *Contractor* ensures that the Designer(s) have the appropriate professional qualifications to achieve the design assurance requirements

WI 620.2 Technical Assurance

- (1) The *works* including the design of the *works* will be subject to the *Employer's* Change Assurance Process, The *Contractor* is required to submit sufficient documentation to enable the design to be reviewed and approved by the Change Assurance Panel. The assurance process requires that a number of gates are passed in order to permit development of the *works*. The *Contractor* provides;
 - A design to obtain an Approval in Principle
 - A detailed design to obtain Approval of Design
 - Test plans and draft O&M manuals to obtain Acceptance of Assets
 - As-built drawings and O&M manuals to obtain Closure of Change
- (2) The *Contractor* the Master Document List (MDL). The MDL details the documentation required in order for approval of each assurance gate to be obtained included in Annexure 2.
- (3) The *Contractor* supplies such documentation in respect of each assurance gate on within such timescale as required to achieve the programme having regard to the time required by the *Employer* to review such documentation.
- (4) The *Contractor* takes account of any *Employer* comments and revises the documentations so that such comments are addressed.

WI 620.3 Construction

- (1) The *Contractor* Provides the *works* in accordance with the assured design and with all applicable law, the Standards and the contract requirements.
- (2) The *Contractor* assures the *Employer*, through submissions to the *Project Manager*, that the *works* have been constructed in accordance with the contract. The *Contractor* prepares, retains and provides evidence to the *Project*



Manager to that effect.

- (3) The *Contractor* implements self certification processes to ensure that the *works* have been constructed in accordance with the contract. Such self certification processes includes demonstrably independent scrutiny, monitoring, checking and audit regimes in accordance with the contract requirements. The *Contractor* ensures independence in assessment, and certification in the quality assurance, quality control and building control processes. The processes are identified in the *Contractor's* Project Quality and Assurance Plan which will indicate the relevant processes and procedures used.

WI 625 Contractor's Project Quality and Assurance Plan

WI 625.1 Project Quality and Assurance Plan

- (1) Within four weeks of the starting date, the *Contractor* submits a Project Quality and Assurance Plan to the *Project Manager* for acceptance. The *Contractor* reviews and updates the plan if significant changes occur to the processes, organisation or requirements or as reasonably required by the *Project Manager*.
- (2) The *Contractor's* Project Quality and Assurance Plan is supported by applicable QCPs, ITPs, Safe Systems of Work and references to and extracts from Standards.
- (3) The *Contractor's* Project Quality and Assurance Plan include the controls to be applied by designers, Subcontractors, suppliers and sub-tiers thereof, both directly and by identifying the Quality and Assurance System documentation that designers, Subcontractors, suppliers and sub-tiers thereof are required to produce. The *Contractor* ensures that designers, Subcontractors, suppliers and sub-tiers thereof agree to and implement the applicable controls specified in the *Contractor's* Project Quality and Assurance Plan and the identified quality system documentation.
- (4) The *Contractor*, the designers, Subcontractors, suppliers and sub-tiers thereof do not commence any activity on any part of the *works* for which the *Contractor's* Project Quality and Assurance Plan, applicable QCPs and ITPs, have not been accepted by the *Project Manager*.
- (5) The *Contractor's* Project Quality and Assurance Plan, as a minimum, complies with the requirements of the guidelines set out in BS EN ISO 10005 and, as appropriate:
 - Covers the relevant phases of the contract (design, assessments, procurement, manufacture, condition/defect surveys, construction, installation, monitoring, testing, commissioning and maintenance);
 - Complies with BE EN ISO 9000, BS EN ISO 9001 and BS EN ISO 9004 (as applicable)
 - Incorporates comprehensive quality system procedures for all identified risk and processes associated with this contract;
 - Identifies clear and robust QCPs to provide independence of all inspection and checking processes to ensure that self certification is in place and



- evidence provided to assure the design and construction;
- Indicates the inter-relationship of the *Contractor's* Project Quality and Assurance Plan with other associated documentation of the *Contractor*;
 - Describes the relationships and activities of the *Contractor*, designers, Subcontractors, suppliers and consultants including organograms;
 - Specifies the requirements of the quality systems to be operated by the *Contractor's* designers, Subcontractors and suppliers;
 - Includes *Contractor's*, designers' and Sub-Contractors' design control systems/procedures;
 - Identifies the requirements for self certification, audit, intervention and inspection of all subcontracted processes;
 - Incorporates a monitoring system for procurement, maintenance and condition of Plant and Materials to ensure that contract objectives can be fulfilled;
 - Allows for external second and third party audits to be carried out as required by the *Project Manager* and Others as described above;
 - Incorporates comprehensive Quality and Assurance System audit procedures including the preparation of audit reports;
 - Specifies procedures to rectify non-conformities raised, including System Defects raised as a result of both internal and external audits;
 - Describes the statistical process techniques to be used to prevent the occurrence of non-conformities;
 - Provides for regular management reviews of the contract Quality and Assurance System;
 - Includes records management procedures including for review and verification of records by the *Contractor's* quality assurance manager and compilation of Assurance packages at Handover of new and altered assets; and
 - Identifies quality related Key Performance Indicators;
- (6) The *Contractor* prepares, and updates as required, QCPs to support the *Contractor's* Project Quality and Assurance Plan for the works. The *Contractor* incorporates requirements for review and update of the QCPs in the *Contractor's* Project Quality and Assurance Plan. The *Project Manager* identifies those QCPs which require *Project Manager* acceptance.
- (7) The primary activities addressed by QCPs and to be implemented by the *Contractor* are to include
- Preparation of QCPs for design (including temporary works);
 - Procurement, manufacture, construction, installation and testing along with all quality control processes;
 - Design control including verification, validation, approval and acceptance by Others where relevant;



- Design change control;
 - Preparation of Safe Systems of Work;
 - Preparation, review and approval of ITPs;
 - Preparation of Materials requisitions and approval of purchase orders in accordance with accepted specifications;
 - Performance of quality verification inspections;
 - Control and calibration of measuring and test Equipment;
 - Scheduling of necessary testing;
 - Interim inspection of work including Equipment and temporary works;
 - Monitoring against Safe Systems of Work;
 - Monitoring the activities of designers, Subcontractors, suppliers and sub-tiers thereof, to ensure their compliance with the contract;
 - Review of Material suppliers' and Subcontractors' quality verification documentation;
 - Administration of Non-conformity and reporting to the *Project Manager*;
 - Certification control and co-ordination;
 - Quality verification inspection of the completed *works* and collation delivery of quality control records;
 - Collation delivery of design and construction compliance verification and Assurance records;
 - Administration of design, procurement, manufacture, construction, installation, test and functional Non-conformities and concessions and reporting of them to the *Project Manager*;
 - Production of four-weekly reports of quality issues including Nonconformity records and Key Performance Indicators; and
 - Verification of Plant and Materials and system compliance through conducting inspection, testing and commissioning
- (8) The *Contractor*, the designers, Subcontractors and suppliers completes the *works* in accordance with the *Contractor's* Project Quality and Assurance Plan and QCPs.

WI 630 **Surveillance and Audits**

WI 630.1 Surveillance

- (1) The *Contractor's* Quality Management System provides a process and procedure for surveillance of the design and construction of the *works* by a process of audits, certification and self-certification. The *Contractor* collates all the quality documentation from his inspection and testing processes and other verification activities.



WI 630.2 Audit Programme

- (1) The *Contractor* submits, with his *Contractor's* Project Quality and Assurance Plan, a schedule of internal, designer, Subcontractor and supplier audits that will be conducted by the *Contractor's* personnel. The schedule, scope and method of the audits enable the *Contractor* to verify that all aspects of the *works* are conducted in accordance with contractual requirements
- (2) The schedule and any amendments are subject to acceptance by the *Project Manager*. The schedule is reviewed by the *Contractor* with the *Project Manager*, every four weeks, to reflect all relevant aspects and the developing and changing nature of the Project and the construction programme. This review will consider trends from audit findings and the adequacy of preventative measures put in place

WI 630.3 Audit Participation

- (1) The *Contractor* allows the *Employer*, the *Project Manager*, and Others to observe or participate in audits. The *Contractor* provides the facilities and access necessary for these audits to be carried out effectively
- (2) The *Contractor* places similar requirements on his designers, sub-contractor's, and suppliers with regards to audit participation.

WI630.4 Audit process and outputs

- (1) All audits performed by the *Contractor* are carried out as described in BS EN ISO 19011 and all reports are, unless otherwise agreed by the *Project Manager*, to be submitted for acceptance
- (2) The *Contractor* maintains an audit / CARs / preventative action reports database for use by the *Contractor* and the *Project Manager*.

WI 635 Contractor's Resources

WI 635.1 Resources

- (1) The *Contractor's* Project Quality and Assurance Plan includes organisation charts for the *Contractor* and all designers, Subcontractors, and suppliers to show the reporting structure of those personnel responsible for quality on the contract and particularly those personnel responsible for self certification activities
- (2) The *Contractor's* Project Quality and Assurance Plan includes curriculum vitae for all such quality personnel, including those of Subcontractors, designers, and suppliers and particularly those nominated for self certification activities.
- (3) The *Contractor* demonstrates that adequate resources are provided to fulfil the contract.
- (4) The *Contractor* provides appropriate training to all personnel in the operation of the Quality Management System and maintains training records.



WI 640 Self Certification

WI 640.1 Self certification requirements

- (1) The *Contractor* implements a quality control system for the contract to include monitoring, inspection and corrective action to ensure that the specified requirements are achieved.
- (2) The *Contractor* submits, to the *Project Manager* for acceptance, his proposals for self certification within the *Contractor's* Project Quality and Assurance Plan. This self certification plan demonstrates the processes to be employed and proformas to be used to verify compliance with the specified requirements. The plan is based on the *Contractor's* existing company management system procedures and proformas. The *Contractor* submits the plan to the *Project Manager* for acceptance before commencement of the *works* and within 4 weeks after contract award.
- (3) The plan identifies the means provided to achieve self certification of designers, Subcontractors and suppliers. The plan states when the designers', Subcontractors' and suppliers' own systems will be employed, and where the *Contractor* will exercise quality control over the designer, Subcontractors or supplier.
- (4) There are specific requirements within the Works Information for independent checking and inspection of elements of the works.
- (5) The *Contractor* ensures that all quality control of construction of the *works* is independent of the production control of the works.
- (6) The *Contractor* submits, to the *Project Manager* for acceptance, the ITPs and inspection check lists for the elements of the works. The *Project Manager* may identify Hold Points at which *Project Manager* inspection and acceptance is required before work proceeds.
- (7) The *Contractor* produces appropriate self certification records to demonstrate that the supporting documents (inter alia: ITPs, inspection check lists, supplier compliance certificates, concrete and other Site measurement commissioning records, audit records, "red-line" mark-ups, and "as-built" details) have been completed in accordance with contract requirements.
- (8) The *Contractor* raises a NCR whenever corrective action for an identified Defect cannot be implemented within the shift.
- (9) The *Contractor* submits NCR corrective proposals to the *Project Manager* for acceptance (if appropriate the *Project Manager* consults the infrastructure owner or maintainer). The work does not proceed until the *Project Manager* has accepted the relevant NCR corrective proposal. Records showing the successful corrective and preventative action are included in the quality control records.
- (10) The *Contractor* maintains the quality control records in an accepted database to



verify Assurance at Completion of a section of the works. The *Project Manager* may access and interrogate the database and records at any time during the progress of the works. The database is indexed and formally transferred to the *Project Manager* at Completion of a section of the works.

- (11) The *Contractor* carries out scheduled, structured audits on specific elements of quality control for the works, by trade or by location, to verify that the records are prepared and maintained in an acceptable form. The *Project Manager* may attend these audits.
- (12) The *Project Manager* audits the records and NCR registers and reports during the progress of the works.
- (13) The *Project Manager* monitors the effectiveness of the *Contractor's* self certification system through:
 - surveillance,
 - witnessing appropriate key activities,
 - review of certification and records,
 - monitoring and participation in the *Contractor's* audit schedule,
 - independent auditing.

WI 645 Materials and Construction

WI 645.1 Quality System

- (1) The *Contractor* implements a quality control system for the contract to include monitoring, inspection and corrective action to ensure that the specified materials and construction methodology requirements are achieved.

WI 650 Schedule of *Contractor's* Management Plans and other procedural documentation

WI 650.1 The *Contractor* is required to note the documents as part of the *works* and included in documents such as the MDL.

WI 655 Quality Control

WI 655.1 Quality Plan

- (1) The *Contractor* agrees a quality plan with the *Project Manager* that demonstrates and verifies that the *works* satisfy the *Employer's* requirements as contained in the Works Information as may be modified from time to time. The quality plan incorporates requirements such as hold-points, inspections or other tests required by the *Project Manager*.
- (2) The agreed quality plan does not replace or supersede any other quality verification procedures that forms the *Contractor's* own quality system or that is required elsewhere under the contract, e.g. Certificate of Registration to an



Accredited Quality Scheme, Material Certification, Certificate of Completion / Conformity, Staff Training Certificates etc.

WI 655.2 Setting Out

- (1) The *Contractor* accurately, truly and properly sets out the *works* and is responsible for the correctness of the positions, levels, dimensions and alignment of all parts of the works. The *Contractor* provides all necessary instruments, appliances, materials, equipment and labour in connection therewith.

WI 655.3 Accuracy of Setting Out

- (1) The *Contractor* ensures when setting out, that he complies with all requirements for special accuracy and critical dimensions shown on drawings or otherwise specified. Where work is not otherwise specified the *Contractor* does not exceed tolerances stated in the contract documents.
- (2) The *Contractor* takes corrective action in respect of work not complying with the standard of accuracy or tolerances specified, including rectification of work already carried out, adjustment of methods or materials used, increased supervision of identified source of inaccuracy. When any adjustment of design and/or details may be required in respect of same the *Contractor* requests approval from the *Project Manager* who instructs the *Contractor* on the action to be taken. The *Contractor* complies with the *Project Managers* instructions. The *Employer* is not responsible for any cost or time implications arising from the *Contractors* corrective action.
- (3) The *Contractor* arranges the setting out, installation and juxtaposition of equipment so that there are no practically or visually unacceptable changes in plane, line or level and that the finished work has a true and regular appearance.

WI 655.4 *Appearance and Fit*

- (1) The *Contractor* ensures that tolerances of components or equipment do not exceed the maximum deviations in size, position or shape stated.

WI 655.5 *Suitability of Related Work and Conditions*

- (1) Before starting any new section of the *works* the *Contractor* ensures that previous related work is properly completed and to an adequate and suitable condition to receive any follow-on work.

WI 660 Protection of Existing Structures and Services

WI 665.1 Protection of Existing Structures and Services

- (1) The *Contractor* protects the existing structures and services and does not overload them in the undertaking of the *works*.

WI 665 Protection of the Works

WI 665.1 Protection of the Works

- (1) The *Contractor* protects the *works* in respect of everything which a prudent and competent *Contractor* would protect the work and clears away on completion or when no longer required. The *Contractor* repairs and makes good any damage to the *works* arising from such protection to the satisfaction of the *Project Manager*.
- (2) The *Contractor* shall protect all adjacent infrastructure.
- (3) The *Contractor* has regard to and complies with the latest publications and good practice in respect of winter working and is deemed to have included in his prices for taking all reasonable precautions in providing protection or otherwise to avoid delay in the execution of the *works*.
- (4) Any work liable to damage by frost is to be covered up and protected to the satisfaction of the *Project Manager*. Any work damaged by frost is to be cut out and made good at the *Contractor's* expense.

WI 665.2 Existing Mains Services

- (1) The *Contractor* ascertains the positions of all services and makes his own enquiries regarding the existing services prior to commencement of work on Site. No claim in respect of lack of knowledge in respect of same is entertained.
- (2) A number of the existing services crossing the Site serve adjacent properties and remain live during the course of the works. The *Contractor* takes all reasonable precautions to protect such services and affords all reasonable access to the *Employer* or to Others to facilitate any urgent or emergency repair as required by the *Employer*. The *Contractor* repairs any damage caused by the *Contractor* thereto.
- (3) The *Contractor* repairs all existing sewers and drains which are displaced or blocked through the execution of the *works* to the satisfaction of the *Project Manager*. On completion of the *works* the *Contractor* shall provides evidence that all underground services, whether existing or new, are not displaced or blocked.
- (4) The *Contractor* applies to the appropriate statutory authorities for any discharge licences or temporary main supplies (other than those which are specifically to be provided by the *Employer*) and pays for all charges in connection therewith.
- (5) The *Contractor* indemnifies the *Employer* against any expense, liability, loss or claim, etc. whether received before or after Completion due to the failure to comply with the requirements of WI 665.2.



WI 700 TESTS AND INSPECTIONS

WI 700.1 Inspections of the Works

- (1) The *Contractor* arranges and facilitates on-site inspections of the *works* and off-site inspections of the *Contractor's* facilities where work is being carried out in relation to the *works* as required by the *Project Manager*.
- (2) Where necessary due to the location of the factory the *Contractor* provides accommodation for 4 personnel of the *Employer* to attend Factory Acceptance Testing.

WI 705 Test and inspection schedule

- (1) Notwithstanding items mentioned elsewhere in the contract the *Contractor* shall provide a test and inspection schedule and plan, prior to commencement of construction, for the following (but not limited to):

WI 705.1 Test and inspection schedule

- (1) The *Contractor* complies with the requirements of the following Inspection and Test Plan schedule and allows within the Accepted Programme for inspections and test carried out by the *Project Manager* and Others.

WI 705.2 Terminology

- (1) The following are terms used in this section of the Works Information.

Term	Meaning
Assurance	Process of ensuring and providing evidence that the <i>works</i> have been designed and constructed in compliance with the <i>Employer's</i> Requirements.
Conformity	Fulfilment of specified requirements.
<i>Employer's</i> Requirements	The output from the <i>works</i> in respect of spatial and operational improvements documented in the <i>Employer's</i> Requirement Statement in Works Information Chapter 1A, and the applicable Standards and legislation.
Hold Point	A point in time in the construction of an element of the <i>works</i> at which the <i>Project Manager</i> shall be invited to inspect the <i>works</i> to verify quality or completeness prior to the work progressing. The <i>Project Manager</i> will identify these Hold Points during his review of the Inspection and Test Plans.
Inspection & Test Plans (ITPs)	Plans specifying the activities required to establish how Conformity is to be verified. They identify the responsibilities for executing the activities, the documents controlling them and the records required to provide Assurance. These are prepared for a particular element of the <i>works</i> to support the <i>Contractor's</i> Project Assurance Plan.



Non Conformance Report (NCR)	A statement raised to record a Non-conformity (Defect) in the product, workmanship, or system.
Nonconformity	A Defect - as defined in clause 11.2 (5) of the <i>conditions of contract</i> . (The term “Non-conformity” is used to be consistent with industry practice and includes System Defects as defined below.)
Outstanding Work List	A list generated at an inspection or acceptance stage to identify Defects which must be remedied before an asset can be put into operational use.
Quality Control Procedures (QCPs)	Documents that specify operational techniques or activities that are used to fulfil requirements for quality, and as such support the contract quality plan.
Site Query (SQ)	A request for information, clarification or agreement to a proposed action.
Verification Activity Plan	Document prepared and owned by the <i>Employer</i> in accordance with LUL Standard S1538.

WI 710 Management of tests and inspections

The *Contractor* shall allow the *Project Manager* access at all times to carry out any all tests and inspections. The *Contractor* allow for all these *works* and activities in the programme

WI 715 Covering up completed work

Before any works are covered up, the *Contractor* provides reasonable notice to allow the *Project Manager* and/or the Supervisor to inspect before it is covered up. If the *Contractor* does not provide notice the *Contractor* uncovers and recovers such work if instructed by the *Project Manager* at no cost to the *Employer* and the *Project Manager’s* instruction is not a compensation event.

WI 720 Procedures for inspections and watching tests

The *Project Manager* and the *Contractor* agree a procedure for inspections and watching tests that will reasonably allow the *Project Manager* and/or the Supervisor to be assured of the inspection and test results.

WI 725 Testing and Commissioning

- (1) The *Contractor* undertakes all testing and commissioning of all installations incorporated into the works.
- (2) Testing and commissioning is in accordance with the requirements of the relevant specifications.



- (3) An Inspection and Test Plan shall be provided with the detailed design, describing how the works will be inspected and tested at the factory, during the works and on completion of the works. The inspection and test plan shall include testing of the interfaces.
- (4) Inspection check sheets and inspection reports shall be produced for all factory and site inspection and submitted for acceptance.
- (5) Test specifications shall be produced for all factory and site tests and submitted for acceptance. The test specification shall include the following as a minimum:
 - i. Scope
 - ii. Equipment/ system to be tested
 - iii. Competence requirements for tester
 - iv. Test equipment required
 - v. Method of testing
 - vi. Measurements/records to be taken
 - vii. Expected results
 - viii. Pass/Fail criteria
 - ix. Access requirements
- (6) Test reports shall be submitted. Type test reports are to be signed by the tester, and reviewed and approved by the relevant engineer within the *Contractor's* design team.

WI 800 MANAGEMENT OF THE WORKS

WI 800.1 Project execution Plan

- (1) Within four weeks of the starting date, the *Contractor* submits for acceptance a Project Execution Plan (PEP) which sets out in detail how the *Contractor* plans to Provide the *Works* to achieve Completion on or before the Completion Date, within the forecast total of the Prices and in accordance with Statutory Requirements and the requirements of the Works Information. The PEP is based on the *Contractors* own procedures and includes additional topics agreed between the *Project Manager* and the *Contractor*. The PEP describes the interrelationship of the plans and procedures requested by this and other parts of the Works Information.

WI 805 The *Contractor's* Representative

WI 805.1 Site Management and Supervision

- (1) The *Contractor* provides full time experienced and competent site management



and supervision staff approved by the *Project Manager* on the Site at all times when the *Contractor* is carrying out works.

- (2) The *Contractor* does not replace any approved site management or supervision without the prior written approval of the *Project Manager* and replaces them with site management or supervision approved by the *Project Manager*.
- (3) Any instructions given to the *Contractor's* Site management is deemed to have been issued to the *Contractor*.
- (4) The *Contractor* removes any site management or supervision from the Site if the *Project Manager* reasonably believed that the Site management or supervision does not provide the management and quality control required for the works.
- (5) Any person employed for the *works* by the *Contractor*, who in the opinion of the *Project Manager* is incompetent or who acts in an improper or unsafe manner, shall be removed from the Site. Such persons shall not return to the Site for employment in any capacity without the permission of the *Project Manager*.
- (6) The *Contractor* appoints a *Contractor's Representative* to act on behalf of the *Contractor* through out the project
- (7) As part of the *Contractor's* mobilisation duties the *Contractor* understands the structure and format of the *Employer's* project team, in particular the appointment of the *Project Manager* and *Supervisor* and any delegations thereto and submits to the *Project Manager* within 4 weeks of the *starting date* for acceptance a communication plan such that there are clear lines of communications between the *Contractor* and the *Project Manager*.
- (8) The communication plan is to facilitate:
 - Receipt of instructions
 - Understanding of levels of authority to receive instructions by the *Project Manager* or *Supervisor*
 - Receipt of other contractual communications
- (9) The *Contractor* ensures that his project team and Site organisation are established and changed as necessary to facilitate effective communications between the *Employer's* representatives.

WI 810 Progress Meetings

WI 810.1 Meetings

- (1) The *Contractor* coordinates design meetings on a fortnightly basis or as required by the *Project Manager*



- (2) The *Contractor* attends Site progress meetings as required by the *Project Manager*.
- (3) The *Contractor* attends any meetings convened by the *Project Manager* at the times and places instructed.
- (4) The *Contractor* and *Project Manager* have joint weekly meetings which include a review of health and safety, progress, environment, cost, risk, performance, quality, design, subcontracting, third party liaison and special subjects.
- (5) The *Contractor* ensures his subcontractors attend meetings where relevant or where required by the *Project Manager*.
- (6) The *Contractor* and *Project Manager* agree timing, chair, minute takers and attendees for the meeting. Actions from meetings are agreed, documented and logged with Completion Dates. Meetings may be combined or re-scheduled with the agreement of the *Project Manager*.
- (7) Risk reduction meetings as per clause 16 of the *conditions of contract* are to be held on a weekly basis or in accordance with clause 16.2.
- (8) Other meetings are agreed between the *Contractor* and *Project Manager* as required.

WI 815 Reporting

WI 815.1 Progress Report

- (1) The *Contractor* issues a comprehensive progress report at four week intervals to suit the DLR 13 period calendar reporting cycle. The first progress report is issued at a date to be instructed by the *Project Manager* which will be no more than 28 days after the *starting date*.
- (2) The detailed format of the report is agreed with the *Project Manager* prior to the submission of the first report which includes the following as a minimum
 - Executive Summary and Key Issues
 - Health and Safety, Security and loss prevention
 - Progress
 - Programme Narrative
 - Resources (Manpower and Equipment);
 - Design
 - Ground Movement – Monitoring and Control
 - Procurement
 - Commercial
 - Risk Management
 - Quality and Assurance



- Environment Activities
- Community and stakeholder relations
- Station and Track Access
- Updated Activity schedule

WI 815.2 Details of key parts of the report are set out in the following paragraphs

(1) Executive Summary and Key Issues

Up to two pages summarising the achievements, key issues, interfaces experienced during the period, a summary of safety statistics, the current commercial position relating to Price for Work Done to Date and estimated final cost.

(2) Health and Safety, Security and Loss Prevention

A summary of all activities related to health and safety, security and loss prevention such as meetings, instructions, inductions, and special achievements. Safety defects and security breaches are summarised together with a brief description of any lost time due to injury or damage to property and near misses. Safety statistics, accident frequency rates (AFR) including all lost time incidents and RIDDOR reportable incidents in the period and cumulative is also included.

Trends are provided together with proposed action to improve safety performance. The four weekly health and safety information, in accordance with WI 1100, is also included within this part of the report.

(3) Progress

This part comprises a narrative report on the progress achieved against that planned in the relevant period, together with explanations of any delays incurred (apportioned by categories) and details of plans on how the delays are recovered. Progress in the period is reported against the Accepted Programme on a physical percentage complete basis by discipline and overall.

Dashboards are included in the reports showing status against all disciplines. The report describes the work which is on the critical path/s, showing the amount of remaining work, the movement of time risk allowances and float in the period and that is remaining.

(4) Programme Narrative and Delay Analysis

This part identifies the current Accepted Programme and summarises the information contained on each programme which the *Contractor* submits for acceptance. The *Contractor* comments on the progress of all aspects of the work including design, procurement and construction as well as the delay analysis described in WI 500.

Special emphasis is given to issues notified, or to be notified, as early warnings which may delay completion or delay achievement of a Key Date.



(5) Design

This part describes the status of the design and engineering of the works. The percentage status of completion of each drawing, the percentage of drawings completed and the number and category of drawings to be completed is recorded. The *Contractor* identifies the progress on preparation of the Assurance packages. Progress of design is shown graphically by the use of slip charts derived from the P6 programme, programme for acceptance and reports the status of design relative to the critical path and measures being taken to address any slippage.

(6) Procurement

This part describes the status of procurement (including procurement of Subcontractors) and purchasing, including delivery of all Equipment and Plant and Materials. It highlights those items that have long delivery times or where the procurement dates have limited float. It shall also include the latest procurement schedule.

(7) Commercial

This part includes all commercial matters including;

- Compensation events
- Early warning matters
- Forecast to go
- Earned Value Analysis
- Cost and schedule performance
- Risks

(8) Ground Movement – Monitoring and Control

This part presents an overview of the status of Defects and condition surveys, monitoring instrumentation, the movements experienced in the period and to date, and details of any breaches of performance criteria and mitigation measures implemented.

(9) Risk and Opportunity Management

The *Contractor* identifies in this part of the period progress report, the top ten risks and opportunities to the *works* as assessed. This part addresses the following issues in relation to each of the identified ten risks and opportunities:

- control measures for the risks identified and the cost of mitigation if *Employer's* risk.
- opportunity implementation actions and the benefits
- action completion dates and owners
- status of actions

- any further issues raised/residual risks
- closed and new risks
- a narrative is provided in this part of the period progress report for each risk identified.

(10) Consents

This part details:

- the status of all consents including progress against programme
- the identification of issues, risks and opportunities associated with consents

(11) Quality and Assurance

This part details:

- the latest revision of the *Contractor's* project quality and Assurance Plans
- a summary of changes to the *Contractor's* project quality and Assurance Plans
- progress on safe system of works, procedures, inspection and test plans
- any concerns or difficulties in providing certification or quality records to demonstrate the compliance of completed work
- a summary of the assessment and monitoring of suppliers and Subcontractor quality systems that have been carried out
- summary of recent ongoing and planned quality audits
- status of all Non-Conformance Reports (NCRs)
- status of all corrective action requests (CARs)
- any other significant quality issues

(12) Environmental Activities

This part details:

- the status of the key environmental management systems - including but not limited to the environmental management plan and Site waste management plan.
- progress against agreed environmental targets
- summary of environmental training provided in the period
- status of all environmental consents
- status of all environmental incidents
- status of all environmental audits performed, including summary of key findings and outline of planned audits
- summary of all environmental monitoring – including details of any

breaches or complaints.

(13) Community Relations and Stakeholder management

This part details:

- the latest revision of the project communications plan
- records of all *works* notifications issued and requirements for further notification
- records of all complaints received and actions taken
- records of all community relations initiatives made and contacts made

(14) Station and Track Access

This part details:

- the actual access used against that planned with reasons for not achieving the planned access
- any access cancelled, reduced or extended by the *Employer*
- Lane Rental periods used with details of activities carried out during track closures.

(15) Progress photographs

The *Contractor* provides three hundred colour digital photographs each month (minimum resolution ten mega-pixels) recording the progress of the works. The areas photographed are to be accepted by the *Project Manager*.

The *Contractor* loads each digital image onto a file share system specified by the *Project Manager* along with the following information:

- date of photograph
- brief description/location
- photographer's name and contact details
- serial number based on date (for example 070814-1 for photo taken on 7th August 2014)

The copyright of all photographs taken are to be vested with the *Employer*.

Taking photographs for promotional purposes on or about the Site is not permitted unless express written permission of the *Project Manager* is granted. Photographs are to be suitable for reproduction at A3 size.

Over and above these photographs, the *Contractor* ensures his section managers take adequate record photographs of progress of their sections of the *works* including:

- general progress
- defects
- completed

**WI 820 Work Plan**

- (1) For each element of work in hand, the *Contractor* issues a work plan(s), no later than 0900 on Monday of each week. The work plan comprises a four week rolling programme (one week look back and three weeks look ahead) covering day to day activities. This work plan is in Gantt chart format and be resource loaded.
- (2) The headings include Safety, Progress, Programme, Design, Quality, Access, Environment and Issues
- (3) The work plan indicates the timing of all proposed hold points in the inspection and test plans identified by the *Project Manager*, for inspection by the *Project Manager* or the *Supervisor* or by Others who have the right of inspection
- (4) There is a narrative report on each section/discipline of the work describing the progress over the week look back and planned for the three weeks look ahead.
- (5) The *Contractor* marks up progress achieved on the look back week with weightings linked to the overall Accepted Programme. Schedule performance indicators (SPIs) and cost performance indicators (CPIs) shall be calculated for the planned and actual work
- (6) The *Contractor* provides details and reasons for targets not being achieved and actions that the *Contractor* intends to take to recover any lost time.
- (7) The format of the work plan is to be agreed by the *Project Manager*, and the work plan is submitted in electronic format and hard copy.
- (8) The work plan is discussed at a work plan meeting to be held at the time of issue of the work plan. The *Project Manager* is to be invited to attend the work plan meeting. The *Contractor* requires the *Contractor's* section managers accountable for the delivery of the *works* to present their section and account for the performance and the short term plan.

WI 825 Daily Log

- (1) The format of the daily log is agreed by the *Project Manager* and the *Contractor*. For each area of the work, the *Contractor* maintains the daily log available to the *Project Manager* and his staff no later than 10:00 hours the next day, inclusive of all weekends. It contains as a minimum:
 - the number of personnel on Site during the day against that planned. For manual workers the personnel are grouped by trade and for non-manual workers by work title
 - items of Equipment and plant on Site against that planned
 - brief description of the work carried out that day,
 - the commencement or completion of any significant event
 - major items of Equipment received or removed including details of Plant



and Materials installed

- work stoppages, interruptions, delays and potential causes of delay with reference to the EWN raised as appropriate.
 - The report shall include a general description and any significant weather events during the course of the day
 - a daily record of work performed on Site, materials delivered
 - Weather records including a general description and any significant weather events during the course of the day.
- (2) The *Contractor* makes the daily log available to the *Project Manager* for inspection on request.

WI 830 Contractor's Proposals to change the Works Information

- (1) Any proposal submitted by the *Contractor* to the *Project Manager* to change the Works Information contains:
- A detailed scope of the change, clearly identifying the specific sections of the Works Information which are proposed to be changed
 - A schedule detailing how the proposed change is to be effected, including activities and anticipated durations for any resulting design changes to be undertaken by the *Contractor*, additional or revised consents, additional or revised concessions, amended Completion Date, amended Key Dates and other relevant information.
 - A proposed revised programme if the programme for the remaining work is affected.
 - Proposed changes to the Prices
- (2) The *Project Manager* replies in accordance with the *conditions of contract* and either;
- Accepts the proposal
 - Accepts the proposal with conditions
 - Rejects the proposal
 - Requests further information
 - Requests a revised proposal to suit considerations required by the *Project Manager* or the *Employer*.

WI 840 Record Drawings

WI 840.1 Requirements

- (1) The *Contractor* keeps a set of all drawings used for construction or fabrication, and associated data and specifications, on the Site marked up to record



accurately all changes during construction including any instructions and technical query responses. See WI 300 BIM Requirements.

- (2) The *Contractor* ensures the drawings and specifications are marked up on a continuous basis by the *Contractor* in a format acceptable to the *Project Manager*. The *Project Manager* has access to these Site records at all times.
- (3) Within two weeks of all work shown on a specific drawing, associated data or specification being completed, the *Contractor* produces the as-built drawings and other information which are clearly marked "As Built". The *Project Manager* may audit the record information.
- (4) The *Contractor* includes or reference these "As Built" drawings in the documentation produced for the Health & Safety File.

WI 845 Risk Management

WI 845.1 Requirements

- (1) The *Employer* and the *Contractor* are committed to identifying and managing risk.
- (2) Risk in this context includes (but is not limited to) those events that, if they do occur, could impact on safety, the environment, the *Employer's* interests or reputation, or the interests of Others. The *Employer's* strategy for this process is summarised below.
- (3) The *Contractor* co-operates with the *Project Manager*, the *Employer*, and with Others in providing information needed in connection with risk management of this contract

WI 845.2 *Employer's* Risk Management strategy

- (1) Risk management is utilised as an action and decision support tool on the project. The process identifies high risk activities and processes and these risks are reviewed to ensure that all reasonable practicable measures are taken to mitigate the risk.
- (2) Risk control measures shall be determined for all risks identified.
- (3) The project Risk Management Process (RMP) is prepared by the *Employer*. The RMP generates information to be used in support of management decision making, and drives action in the prioritisation and reduction of risks to which the Project may be exposed
- (4) The RMP includes a statistical analysis of the identified risks, issues and contingencies. This analysis provides information which is used in management reporting both by the project and TfL as a whole.
- (5) It is emphasized that the risk management process is an ongoing activity comprising regular review and the incorporation of measures so that contract

risks shall be fully mitigated as far as practicable.

- (6) The objectives of the risk management process are:
- To identify risks to the contract before they occur; i.e. events or circumstances that may have an impact on one or more of the project's objectives, including time and cost
 - Eliminate risks wherever possible or reduce the likelihood of occurrence
 - Develop risk management strategies and fall-back plans to deal with risks should they occur.
 - Mitigate or reduce the scale of the potential impact of the risk occurring.
 - Assess cost and programme effect of any agreed risk and link to the project cost plan and schedule
- (7) Having conducted a risk reduction meeting or other risk review, the *Project Manager*, with the *Contractor's* co-operation, ensures that the Risk Register is updated and provides the following information:
- Description of risk
 - Probability of risk occurring
 - Impacts if risk occurs (schedule and cost descriptions and level)
 - Mitigation strategies and actions with dates
 - Risk owner

WI 845.3 *Contractor's* Responsibility for Risk Management

- (1) The *Contractor* submits, within four weeks of the starting date, for acceptance by the *Project Manager*, a Risk Management Plan. The *Contractor* liaises with the *Project Manager* during this time to identify and agree the parameters to be used in the identification and evaluation of risk.
- (2) The focus of the Risk Management Plan should be reduction of risk exposure. It should be results-oriented and not place undue weighting on analysis at the expense of action. It is in the interests of the *Employer* and the *Contractor* to share relevant risk information and work together to prevent the realisation of risks where possible.
- (3) In conjunction with clause 16 of the *conditions of contract* the *Contractor* identifies any changes or newly identified risks to the *Project Manager*.
- (4) The *Contractor* identifies any risks which have been realised and become issues to the *Project Manager*.
- (5) The *Contractor* reports risks and provides risk related information in accordance with the requirements of this contract and the Risk Management Plan.
- (6) The *Contractor* submits an updated version of their Risks and Issues registers, as separate documents, for approval by the *Project Manager* with the 4 weekly period progress report or earlier as required by the *Project Manager*.



- (7) The *Contractor* provides, both in hard-copy and electronic format, a copy of the *Contractor's* current project risk register for reference at each meeting.

WI 845.4 Risk Reduction Meetings

- (1) The *Contractor* meets with the *Project Manager* not less than once in each four week period to review the Risk Register in accordance with clause 16 of the conditions of contract
- (2) The *Contractor* provides the appropriate level of representation at the meetings to review and action the identified risks and notified early warnings

WI 850 Labour

WI 850.1 Employment of Labour

- (1) The *Contractor* employs all labour at not less than the rates of wages and under conditions laid down by law or in accordance with any working rule agreement applicable to the industry concerned.
- (2) The *Contractor* imposes a requirement for the highest level of conduct on his workforce in relation to neighbouring property owners and the public. The *Contractor* removes any person who fails to adhere to the required level of conduct from the Site and the *Project Manager* has the right to demand the removal of any such person from the Site, whether employed directly by the *Contractor* or by his sub-*Contractors*.

**WI 850.2** Competency of Labour

- (1) The *Contractor* ensures that only suitably trained, experienced and competent labour is used at all stages of the *works*. All *Contractor* operatives and sub-*Contractors* are required to be assessed as competent using a formally defined competence management system that is compliant with the task they are undertaking
- (2) The *Contractor* provides the *Project Manager* with a record of the training and relevant certification for all of Site operatives under his control. This is used as evidence that the operatives are suitably qualified for the operations they are carrying out.
- (3) The *Contractor* satisfies himself and warrants that all elements of the *works* as set out and/or referred to and/or reasonably inferred in this Works Information can be completed and achieved for the price stated in the Activity Schedule.

WI 865 **Project Team**

- (1) Before the Starting Date the *Contractor* is to provide to the *Project Manager* for acceptance his proposed organisational chart showing the intended resources allocated to deliver the works.

WI 870 **Communications**

- (1) The *Employer* uses the contract management tool 'A-Site'. The *Contractor* only acts on written instructions from the *Project Manager* issued via this system.
- (2) All instructions given by the *Project Manager* are in writing via the contract management system A Site. The *Contractor* does not act on verbal instructions, the *Contractor* only acts on instructions in writing from the *Project Manager* via the A Site system. If the *Contractor* acts on instructions other than on instructions in writing from the *Project Manager* via A Site, the *Contractor* is not entitled to be paid for so acting or to any additional time. If the *Contractor* acts on instructions other than in writing from the *Project Manager*, the *Contractor* undertakes all *works* required by the *Project Manager* to return the works, at no cost to the *Employer*, to the state they would have been in had the *Contractor* not acted on such instructions.
- (3) The *Contractor* uses the web based Business Collaborator document management system for the transmittal of design and assistance information to the *Employer*,.

License(s) will be allocated if required, for the duration of the project. Documentation and familiarisation for Business Collaborator can also be provided if required.

For more information on Business Collaborator please see the following link:
<https://www.groupbc.com/>



- (4) The *Contractor* ensures that central records, drawings, specifications, Site queries, photographs, inspection and testing reports are accessible to the Project Manager.

WI 875 Labour and Plant Returns

- (1) In addition to any other returns and reports, notices and the like required under the contract, the *Contractor* submits the following to the *Project Manager* in a form accepted by the *Project Manager*.
- Daily Labour Returns giving the numbers, including trade classifications, of all personnel employed on the Site, including those of subcontractors, and the number and position of supervisory and administrative staff.
 - Details of *works* to be carried out each night and the names of personnel involved (to be submitted by 1200 hours on the day of the *works* or 1200 hours Friday for weekend works).
 - Weekly Equipment Returns recording the numbers and types of all mechanical plant & Equipment on the Site and, where applicable, the dates when the plant or Equipment was brought on to and removed from the Site, including the activity the plant or Equipment is required.
 - Incident notification reports for all incidents occurring on Site, in a form to be agreed with the *Project Manager*.
 - List of all Plant and Materials prior to delivery to Site.
 - Timesheets are completed by all *Contractor* personnel. These are signed and endorsed by the relevant line manager. The timesheets are kept in a suitable single location within the *Contractor's* offices and be available for regular audit by the *Project Manager*. A weekly summary of timesheets are submitted to the *Project Manager* by Thursday of the following week. The summary sheet includes a list of all staff working on the Project, the rate being charged, hours expended, and cumulative hours expended.

WI 876 Key Persons Succession Plan

- (1) The *Contractor* submits to the *Project Manager* a key person succession plan for acceptance within 6 weeks of the starting date. A reason for not accepting the key person succession plan is that it does not give sufficient confidence to the *Project Manager* that replacement key people will be properly inducted and their workload handed over to them in a structured and ordered fashion. The *Project Manager* approves all replacement staff and closely monitors their performance during a 3 month probation period. The *Project Manager* accepts these staff only when he is satisfied they have completed the probation period and met the previously agreed objectives.
- (2) The *Contractor* includes, as a minimum, in his key person succession plan the following:



- details of any planned replacement key people
- processes for handing over duties, including length of shadowing time
- submission of CV's
- details of how the *Contractor* proposes to effect any replacement such that there is no impact on the *Contractor* providing the works

WI 877 Lessons Learned

- (1) The *Contractor* will attend and participate in lesson learned workshop as and when required by the *Project Manager*

WI 900 WORKING WITH THE *EMPLOYER* AND WORKING WITH OTHERS

WI 905 Sharing the Working Areas with the *Employer* and Others

WI905.1 General Requirements

- (1) Certain operations not forming part of the *works* may be carried out within or adjacent to the Site by Others under separate arrangements with the *Employer* contract.
- (2) The *Contractor* is responsible for the co-ordination of the *works* with the activities of Others on the Site in respect of programme and technical interfaces. Failure to demonstrate this within accepted programme may give grounds for non-acceptance by the *Project Manager*.
- (3) The *Contractor* exercises the duties of *Principal Contractor* in respect of access for Others and ensures the safety of his workforce and the workforce of Others, and ensures that the progress of the *works* is not compromised.
- (4) The principal interfaces that are anticipated to arise between the *Contractor* and Others during the *works* are set out below:
 - Keolis Amey Docklands (KAD)
- (5) The *Contractor* shall co-ordinate his emergency arrangements with Others.

WI 915 Coordination

WI 915.1 General Requirements

- (1) The *Contractor* coordinates the carrying out of the *works* with the *Employer's* franchisee KAD



- (2) The *Contractor*, as *Principal Contractor*, holds regular general co-ordination meetings as specified below, to which the *Project Manager* shall be invited. All Others who share the Site are invited as required.
- (3) The *Contractor* liaises with Others as to their actual progress and arranges the delivery schedules for his Equipment, Plant and Materials accordingly.
- (4) Where the *Contractor* is required to use shared areas within or adjacent to the Site the *Contractor* agrees who is to be the *Principal Contractor* for these parts of the Site and shall ensure that the limits of primacy are clearly delineated.
- (5) The *Contractor* attends coordination meetings chaired by the respective *Principal Contractor* as agreed for that part of the Site, and provide the necessary assistance to the *Principal Contractor* to enable him to manage the construction area

WI 915.2 Co-ordination Meetings

- (1) In order to be able to co-ordinate the *works* being carried out by Subcontractors and by Others, the *Contractor* arranges types of co-ordination meeting to which he will convene with the relevant personnel.
- (2) The area(s) of the Site allocated to each *Contractor* during any period of work shall be determined and agreed at the meeting.

WI 916 Collaboration

- (1) The *Employer* and the *Contractor* engage with each other in a collaborative manner in a way that is described in BS11000. The objective of this collaborative approach is to facilitate the *Employer* and *Contractor* working more closely together so that the benefits of collaboration and the creation of additional values are achieved and realised by both parties.
- (2) The *Contractor* prepares a 'Relationship Management Plan', as envisaged by BS11000, within 4 weeks of the contract award date that describes how they will work together collaboratively, including with key stakeholders and third party interests, for agreement with the *Project Manager*. Once agree the parties implement the 'Relationship Management Plan

**WI 920 Authorities and utilities providers**

- (1) A number of services may run under, over and adjacent to the site. The *Contractor* liaises with the relevant utilities providers and/or authorities as appropriate in respect of their protection, connection and usage.

WI 921 Community Relations and Publicity

- (1) The *Contractor* includes all residents living in close proximity to the Sites in any stakeholder management plans and in any community and publicity activities.

WI 1000 SERVICES AND OTHER THINGS TO BE PROVIDED**WI 1000.1 Site Compound**

- (1) The *Employer* does not provide an area for a compound.

WI 1000.2 Temporary Accommodation, Plant and Facilities

- (1) The *Contractor* provides and erects, maintains and subsequently removes all temporary office accommodation, messing and welfare, storage, sheds, drying rooms, and other facilities within the area designated by the *Employer* on Site as the Compound that is required for the *Contractor* to carry out and complete the works.
- (2) Not Used.
- (3) The *Contractor* provides the installation, maintenance, energy charges, (including all necessary utility and drainage connections of metered supplies), lighting, heating and everything else required for the temporary accommodation.
- (4) The *Contractor* provides the *Project Manager* with a proposed layout for the *Contractor's* temporary accommodation and facilities and only erects same when approved by the *Project Manager*.
- (5) The accommodation and facilities provided by the *Contractor* are of good quality and comply with current fire safety codes and other regulations relating to temporary office accommodation.
- (6) The *Contractor* re-locates / re-sites offices, sheds etc. as is necessary to facilitate any phasing of the works.
- (7) The *Contractor* provides telephone, ISDN, ADSL and fax lines, e-mails, photocopying for the *works* and pays all charges connected therewith for the duration of the works.
- (8) The *Contractor* removes all temporary accommodation from the Site within a reasonable time of completion of the *works* and makes good all temporary connections etc.

**WI1000.3 Site Communications**

- (1) NOT USED

WI1000.4 Plant, Tools, Vehicles, etc.

- (1) The *Contractor* provides, erects, maintains and removes on completion all necessary plant, tools equipment and vehicles that may be required for carrying out the *works* and pay all charges in connection therewith, including all associated fuel and consumables.
- (2) The *Contractor* ensures that all static plant have drip trays and that fuelling areas to all plant are bunded.

WI1000.5 Hoisting

- (1) The *Contractor* provides all facilities required for loading and unloading materials and hoisting where required.

WI1000.6 Scaffolding

- (1) The *Contractor* provides, erects, maintains and removes on completion all scaffolding, staging, temporary stairs and bridgeways required for the execution of the works, including paying all charges in connection therewith.
- (2) The *Contractor* ensures that all scaffolding is regularly inspected and 'Scaff tags' registers are completed and maintained by the *Contractor*. All installations comply with all regulations.
- (3) The *Contractor* allow access to the *Employer* and the *Project Manager* or any of their agents or consultants onto such scaffolds / temporary stairs and / or bridgeways for the purpose of inspecting the works.
- (4) Mechanical Platforms should be utilised wherever practical. All mechanical platforms must carry current test certificates and be operated by qualified personnel. Drip trays must be fitted to platforms and all other mechanical plant operated within the buildings and/or being utilised on finished surfaces.

WI1000.7 Water for the Works

- (1) The *Employer* does not provide water for the works.

WI1000.8 Temporary Lighting and Power

- (1) The *Contractor* provides all temporary power and lighting for the *works* including all temporary wiring, leads and fittings, generators, switchboards, transforming equipment, etc., and all artificial task lighting as necessary for the carrying out the works.
- (2) The *Contractor* installs, protects and operates the temporary lighting and power installations in a manner which complies with current statutory regulations.

**WI1000.9 Temporary Roadways**

- (1) The *Contractor* provides and maintains all temporary roads, paths, hard standings etc. on the Sites as are required for the *works* and the *Contractor* clears them away once the *works* are complete.

WI1000.10 Temporary Name Boards, Display Boards etc.

- (1) The *Contractor* does not erect name boards unless permitted by the *Project Manager*.

WI1000.11 Temporary Works

- (1) The *Contractor* designs, provides, installs maintains and removes all temporary *works* and temporary measures required for the proper carrying out and completion of the works.
- (2) The *Contractor* notifies the *Project Manager* prior to dismantling any temporary *works* or scaffolding of his intention to dismantle. The temporary *works* or scaffolding must not be dismantled until the *Project Manager* has given his written approval to do so. Any temporary *works* or scaffolding dismantled before it is ascertained whether or not it is required for further use is re-erected free of charge by the *Contractor* if so directed by the *Project Manager*.
- (3) The *Contractor* provides, maintains, erects, alters, adapts and maintains as necessary all temporary supports, needling, shoring and strutting, etc., required for the proper execution of the works.
- (4) The *Contractor* removes temporary supports on completion and all work disturbed by this is made good and reinstated by the *Contractor* to the *Project Manager's* satisfaction.
- (5) The *Contractor* pays all fees and charges (including rates and taxes) to Statutory Authorities or other bodies for all temporary works.

WI1005.2 Scheme Sign Boards

- (1) The *Contractor* only erects a scheme sign board as approved by the *Project Manager*.

WI1010 Services and other things to be provided by the *Employer* for use by the *Contractor***WI 1010.1**

- (1) The *Employer* does not provide any facilities or services for the use of the *Contractor* and Others.
- (2) The *Employer* provides Pre-Construction Health and Safety Information.

WI 1100 HEALTH, SAFETY AND ENVIRONMENTAL REQUIREMENTS

WI 1100.1 Legislation and Standards

- (1) The *Contractor* shall comply with all current safety, health, welfare and environmental legislation and with all current approved Codes of Practice.
- (2) The *Contractor* shall comply with all TfL/DLR and other Standards.

WI 1100.2 Performance Monitoring

- (1) The *Contractor's* health, safety and environmental performance will be monitored by the Employer using the HSE Supplier Assessment. The frequency for assessment shall be determined by the *Employer* in light of the level of activity or performance. The *Contractor* shall participate in the assessment through the provision of information and evidence requested by the *Employer* in respect of the criteria. The results of the assessment will be discussed with the *Contractor* upon completion. If required, the *Contractor* will be asked to prepare an Action Plan in response; progress against which is monitored as part of subsequent assessments.

WI 1100.3 HSE Meetings

Health, safety and environmental performance and issues to be an agenda item on all meetings held between the Employer and the contractor.

WI 1110 Health Safety and Environment Management System

WI 1110.1 HSE Management System

- (1) Unless otherwise agreed with the Project Manager, the *Contractor's* H&S Management System arrangements shall comply with the following requirement:
 - The *Contractor* shall operate a health and safety management system that, as a minimum, meets the requirements contained in OHSAS 18001, HSG65 or can be demonstrated as equivalent

WI 1110.2 HSE KPI reporting

- (1) The *Contractor* shall report its own and its subcontractors HSE performance to the *Employer* on a periodic basis. The data shall be provided in the format prescribed by the *Employer* (details of the current requirements can be found in Appendix 1). The data is to be submitted within 3 business days of the TfL accounting period ending.

WI 1110.3 Audit

- (1) The *Contractor* shall provide a risk-based Health, Safety and Environmental audit schedule. The reports completed after all audits shall be forwarded to the Project Manager, for information, within 2 weeks of the audit being completed.



The report shall include details of any identified issues and any proposed corrective actions. The report shall be reviewed during periodic HSE progress meetings. The *Contractor* allows the Employer to observe or participate in these audits and to conduct additional independent audits, acting reasonably with the cooperation of the *Contractor*, to provide Assurance that the works are being conducted in accordance with the contract requirements. The *Contractor* shall provide the facilities and access necessary for these audits to be carried out.

WI 1110.4 Inspections

- (1) The *Contractor* shall undertake regular Health, Safety and Environmental inspections of the Site at a frequency agreed with the Project Manager to monitor performance in respect of health, safety and the environment. Completed inspection reports shall be submitted to the Project Manager for Information no later than 5 business days following the date of inspection. The *Contractor* allows the Employer to observe or participate in these inspections and to conduct additional independent inspections, as they consider appropriate, to provide assurance that the works are being carried out in accordance with the contract requirements.

WI 1110.5 Incident Reporting and Investigation

- (1) The *Contractor* shall report all HSE incidents, accidents and near miss events which occur during the Contract via the TfL's Info Exchange before the end of the shift in which the incident occurred. The *Contractor* shall be provided with a Login and password for Info Exchange at the start of the contract. *Contractor's* employees who will be inputting data to Info Exchange shall receive a briefing on how to input and send data. The *Contractor* shall, within forty eight (48) hours submit an initial written report and after 14 days a full report detailing as a minimum the following:
 - Description of the incident
 - Immediate actions taken
 - Immediate causes
 - Root causes
 - Actions taken to prevent a recurrence;

With the agreement of the *Project Manager* a longer timescale to complete the final report may be agreed.

All investigation reports will be completed to establish root causes and to a level of detail acceptable at the time to the *Employer*. Any comments provided by the *Employer* shall be addressed by the *Contractor* and an updated report submitted if required.

Where serious accidents occur – Major injuries and Dangerous Occurrence (as defined in RIDDOR) - these shall be subject to a thorough formal investigation. The *Employer* reserves the right to take part in any investigation led by the *Contractor* and/or in certain instances lead their own investigation.

If the incident is serious enough to warrant press attention – all communications with the press will be via the *Employer*.

Nothing in this document supersedes the *Contractor's* responsibility for statutory reporting of incidents/accidents.

WI 1115 Health, Safety and Environmental Competence and Training

WI 1115.1 HSE Advice

- (1) The *Contractor* shall at all times have access to competent Health, Safety and Environmental support to fully implement all the applicable HSE requirements and to ensure a presence on *Site* at regular periods for inspections, advice and instruction.

WI 1115.2 HSE Training

- (1) All operatives and management on site employed directly or indirectly by the *Contractor* shall have received such HS&E training the work they are required to undertake and are to be made fully aware of the techniques and procedures to be used during the works with regard to their own health and safety and the health and safety of others and the protection of the environment.

WI 1115.3 Licenses

- (1) The following licenses are required when working for DLR:
 - Track Awareness* (when working on or near the track)
 - Person in Charge of the Works* (when controlling works on or near the track)
 - Depot Induction
 - Non-trackside H&S Briefing

* These require a Network Rail standard medical

WI 1115.4 Briefings

- (1) The *Contractor* shall attend any HSE briefings specified by the *Employer* and



include all relevant information from these in their own briefings.

- (2) The *Contractor* shall ensure that all visitors to the Site (including Employers staff) are provided with HSE briefing and induction, which will include as a minimum an overview of the activities taking place on Site, the likely hazards on site, the areas where they are permitted to walk, emergency evacuation routes, PPE and First Aid. These briefings/inductions must be aligned with the *Employer's* local inductions where applicable.
- (3) The *Contractor* shall make available to the *Employer* a record of training and the relevant certification for all of their site operatives under their control in order to demonstrate that the operatives are suitably qualified for the operations they are carrying out.
- (4) The *Contractor* shall arrange regular relevant toolbox talks for his staff, and maintains a register of attendees of these sessions for the Project Manager to inspect. The Contractor shall take a pro-active stance on promoting health, safety and environmental awareness on the site and may be asked to participate acting reasonably in any *Employer* led HSE forums and campaigns.

WI 1115.5 Construction Skills Certification Skills

- (1) The *Contractor* shall ensure that all employees, sub contractors and suppliers of any their and other contractors entering the Working Areas are in possession of a valid Construction Skills Certification Scheme (CSCS) card. The Contractor shall ensure that the CSCS card held by individuals is appropriate to the specific role on the project.
- (2) An exception to this requirement is granted where the individual holds a valid card from a CSCS affiliated or amalgamated scheme or other accepted scheme which has been assessed as meeting similar standards. Dispensation against this requirement may given by the *Employer's Project Manager* following a written request by the *Contractor*.

WI 1115.6 Non English Speaking Workers

- (1) The *Contractor* shall have adequate arrangements in place to communicate health and safety information to non-fluent English speakers on site such that:
 - i. They receive the required HSE training/briefing (including any emergency procedures before commencing the work);
 - ii. Instructions are effectively communicated to, and understood by, all such team members

These arrangements shall be described in the Construction Phase Plan.

WI 1115.7 Safety Critical Work

- (1) The *Contractor* shall identify all Safety Critical tasks (as defined by Railways and Other Guided Transport Systems (Safety) Regulations 2006 and amendments) associated with the Contract and agree these with the Employer.



- (2) The *Contractor* shall demonstrate that they have suitable and sufficient arrangements in place to monitor the competence and fitness of those carrying out safety critical tasks. These arrangements should be described in the Construction Phase Plan.
- (3) The *Contractor* shall provide a means of identification for all staff employed on safety critical tasks.

WI 1120 CDM

WI 1120.1 Client

- (1) The *Employer* is the Client for the purposes of the CDM Regulations 2015.

WI 1120.2 Principal Contractor, Principal Designer and Designer

- (1) The *Contractor* is appointed as Principal Contractor as required by the Construction (Design and Management) Regulations 2015 from the Contract Date.
- (2) The *Contractor* is appointed as Principal Designer as required by the Construction (Design and Management) Regulations 2015 from the Contract Date.

WI 1120.3 Design Management Arrangements

- (1) The *Contractor* shall describe its arrangements for managing the pre-construction phase in a Design Management Plan (DMP) (or equivalent). The DMP shall include details of how the health, safety, environment, sustainability and CDM requirements of the design will be met and managed. All topics set out in the TfL Pathway DMP template shall be addressed.

WI 1120.4 Health, Safety and Environment Pre-Construction Information

- (1) The *Contractor*, in their role as the Principal Designer, shall support the Employer (Client) in the development of the pre-construction information by producing, providing and bringing together the required information. The *Employer* may require the Contractor to share this information with other designers, principal contractors and contractors involved in the project. The *Contractor* shall agree the format for the pre-construction information with the *Employer*.

WI 1120.5 F10

- (1) The F10 will be provided by the *Employer* and shall be displayed in the site offices by the *Contractor*.

WI 1120.6 Health and Safety File

- (1) A Health and Safety File shall be produced for all projects, even where there is



only one contractor involved. The *Contractor* shall work with the Employer and/or Principal Designer to compile the Health and Safety File in a format specified by the *Employer*. The format of the H&S file is described in the HSE pre-construction information.

- (2) Where the Principal Designer appointment is terminated or where there is no Principal Designer appointment the *Contractor* shall be responsible for the compiling of the Health and Safety File.

WI 1125 PPE

- (1) The Contractor shall assess and provide the appropriate PPE for his personnel, sub-contractors, suppliers and visitors.

The minimum PPE requirements for working on the DLR are:

- Full orange High Visibility clothing (top and trousers)
- Hard Hat
- Hand protection (gloves)
- Eye protection (safety glasses)
- Safety Boots (not Riggers)

- (2) This high visibility clothing shall carry the Contractor's company name. The Contractor's staff shall not wear DLR branded high visibility clothing, unless working under a 'labour only' contract and requested to by the Project Manager.
- (3) *Contractors* shall not wear any garment or article that impedes their vision or hearing when working for DLR, unless required as part of a safe system of work e.g. hearing protection.
- (4) The wearing of hats, clothing with hoods and any other headwear is prohibited when working for DLR with the exception of:
 - Hoods or headwear required as PPE in response to a risk assessment
 - Headwear specifically designed:
 - To be compatible with PPE and
 - Not to impede vision or hearing

WI 1130 Hazardous Materials

WI1130.1 Control of Substances Hazardous to Health (COSHH)

- (1) The *Contractor* is obliged to notify the *Employer* of any substances to be used in the works that are, or may be, classified as hazardous and which could impact on others in the vicinity of the work where the material is to be used. The *Contractor* shall provide full details of such substances, including storage details and the Risk Assessment for the works to be undertaken. These details shall be submitted to the *Project Manager* prior to the work involving these materials commencing.

WI1130.2 Asbestos



- (1) The *Employer* will supply all information in his possession in respect of the presence of asbestos within the site. The information will be included in the Health and Safety Pre-Construction Information. Based on this information, the *Contractor* shall liaise with the *Employer* to determine where additional surveys will be required and the type of survey to be undertaken.
- (2) Where the *Contractor* believes that they have disturbed asbestos as a consequence of their works, they shall stop works immediately, inform the *Project Manager* and report the incident as a Near Miss via the TfL's Info Exchange.

WI1135 Site Rules

WI1135.1 Agreement of Site Rules

- (1) The *Contractor* shall propose site rules for agreement by the *Employer* and shall ensure that all persons for whom the *Contractor* is responsible abide by the same. The Site Rules shall be included in the Construction Phase Plan.

WI1135.2 Drugs and Alcohol

- (1) The *Contractor* shall operate a drugs and alcohol policy at least as stringent as DLR's Drugs and Alcohol procedure DLR-IMS-SAMS-PRC-00006.
- (2) The *Contractor* shall implement suitable arrangements to verify compliance with its policy including undertaking the necessary alcohol and drug testing. In addition the *Contractor* shall co-operate with the *Employer* who may require the execution of random and/or for cause alcohol and drug tests. The *Contractor* shall provide records of testing if requested by the *Employer*. The testing arrangements shall be described in the Construction Phase Plan.

WI1135.3 Smoking

- (1) Smoking (including e-cigarettes) within the working areas is prohibited with the exception of designated smoking areas. The *Contractor* shall provide suitably signed designated smoking areas within the working areas close to welfare facilities but away from the work locations, site access routes and sensitive neighbouring properties. The *Contractor* shall take all reasonable measures to prevent personnel under his control from smoking on the streets adjacent to worksites.

WI1140 Documentation

WI1140.1 Construction Phase Plan

- (1) The *Contractor* shall ensure that all Health, Safety and Environment Pre-Construction Information provided by the Employer is addressed in the Construction Phase Plan (CPP) and/or the Environmental Management Plan (EMP) in the format agreed with the Employer. For smaller scale works and with the agreement of the Employer, the EMP can be incorporated into the CPP.
- (2) The Construction Phase must not start before a suitable CPP and EMP are in



place and accepted by the Employer.

- (3) For larger/more complex projects, a separate Security Plan may be required; otherwise Security arrangements shall be incorporated into the CPP.
- (4) For larger/more complex projects a separate Traffic Management Plan may be required, otherwise traffic management arrangements shall be incorporated into the CPP.
- (5) The *Contractor* shall maintain the CPP as required by the CDM Regulations. Following the Employer's acceptance of the initial CPP, subsequent updates shall be submitted to the Employer for acceptance.

WI1140.2 Emergency Preparedness Plan

- (1) The Emergency Preparedness Plan (EPP) shall be submitted to the *Employer* for acceptance prior to commencement of work on Site. In addition to describing the emergency arrangements for the works on site, the plan shall consider potential impacts beyond the site boundary, especially where there are interfaces with neighbours, operational assets etc. Any existing site specific EPPs will be provided as part of the pre-construction information, and should be incorporated in the Contractor's EPP as appropriate. For smaller scale works, and with the agreement of the Employer, the EPP can be incorporated into the CPP.
- (2) Immediately following an emergency, or following a simulated emergency exercise, the *Contractor* shall review the actions taken, against the requirements set out in the EPP, and revise the EPP accordingly. The output of these reviews shall be shared with the *Employer*.

WI1140.3 Method Statements/Work Package Plans

- (1) The *Contractor* is responsible for producing and approving all Method Statements (also known as Safe Systems of Work and Work Package Plans) in a format agreed with the *Employer*. The *Contractor* shall submit a schedule of Method Statements to the *Employer* for acceptance at contract start date. The *Employer* shall determine which Method Statements they will review for acceptance.
- (2) The *Contractor* shall submit all Method Statements to the *Employer* with adequate time allowed for any required acceptances to be gained prior to that element of the works starting on site. The time allowed for review will be agreed with the *Employer*, in line with the requirements with the Working on the Railway Manual (WoRM) procedure SOP PC 2.01. No element of the work shall commence without a Method Statement being produced and approved by the *Contractor* and being accepted by the *Employer* where required.
- (3) All Method Statements and supporting documentation, including any relevant approvals from others, shall represent and detail the *Contractors* planned works and address construction sequences, co-ordination with third parties and the relevant control and mitigation measures for identified risks.



- (4) Within each Method Statement the *Contractor* shall include a risk assessment that demonstrates how potential HSE risks resulting from the works have been mitigated to ALARP status.
- (5) Where sub-contractors are used, the *Contractor* shall ensure that they have reviewed and approved all Method Statements produced by the sub-contractor before they are submitted to the Employer.

WI1145 Fire

WI1145.1 General Requirements

- (1) The Contractor shall ensure that all works are compliant with the relevant legislation, Standards, TfL guidance and industry best practice in terms of fire compliance.
- (2) The Contractor shall make himself aware of any existing fire evacuation arrangements for the site, and co-ordinate their own arrangements with those of the site Landlord (as provide in the HSE pre-construction information).
- (3) The Contractor shall develop a fire evacuation procedure for agreement with the Employer. The Contractor shall ensure that all persons working on Site or who may have authority to visit site form time to time are aware of this procedure and receive any instruction that might be appropriate. These arrangements shall be recorded in the Emergency Preparedness Plan.
- (4) The Contractor shall remove all superfluous flammable materials from site on a daily basis.
- (5) The Contractor shall obtain the consent in writing from the Employer before storing or using plant, equipment or materials involving risk of fire or posing any hazard to any person and property.
- (6) The Contractor shall provide any additional fire extinguishers or other fire suppression systems on site as may be required to deal with the Contractor's method of working and/or any materials, packaging and equipment brought or stored on site by the Contractor.
- (7) The Contractor shall take all precautions to prevent the outbreak of fire arising from the works.

WI 1145.2 Isolations of Fire Detection and Suppression Systems

- (1) The *Contractor* shall agree the proposed isolation plan to suit his method of working with the *Employer*, and shall liaise with the *Employer* to make the necessary arrangements for these isolations.

WI 1145.3 Hot Works

- (1) The *Contractor* shall liaise with the *Employer* regarding Hot Works and the

obtaining of any necessary permits associated with these works.

WI 1150 Electromagnetic Disturbance

- (1) The *Contractor* shall take all necessary precautions to avoid excessive electromagnetic disturbance of apparatus outside of the site. The *Contractor* shall ensure that all electrical equipment and plant is suppressed so as to cause no unacceptable electrical or other interference to surrounding properties.

- (1) The *Contractor* complies with all current safety, health and welfare legislation and with all current approved Codes of Practice issued by the Health & Safety Executive and with the following.

- (2) The *Contractor* reports on a regular basis in a format agreed with the Project Manager to include:
 - Number of employees
 - Number of hours worked
 - Number of fatalities
 - Number of RIDDORs.
 - Number of Major Injuries
 - Number of Lost Time Injuries (LTIs)
 - Number of Incidents (H,S&E)

WI1105.1 Smoking, Alcohol and Illicit Substances

- (1) Smoking, being under the influence of alcohol and/or illicit substances on the Site is forbidden. If any person is found or suspected to be in breach of this, then such person will be removed forthwith from the Site and will not be permitted back onto the Site under any circumstances. The Transport and Work Act 1992 applies.

WI 1105.2 Emergency Numbers

- (1) All out of hours and emergency contact numbers shall be provided to the *Project Manager* prior to commencement of work on Site.

WI 1105.3 First Aid

- (1) The *Contractor* provides trained first aiders at a ratio of at least 1 per 50 operatives or part thereof.

WI 1105.4 CDM Regulations

- (1) The *Contractor* complies fully with the requirements of the Construction (Design and Management) Regulations 2015.
- (2) The *Contractor* takes on the role of Principal Designer and Principal Contractor in accordance with the requirements of the Construction (Design and Management) Regulations 2015.

WI 1110.1 Health & Safety Plan

- (1) The *Contractor* develops a Health and Safety Plan for the carrying out of the works, setting out without limitation;
 - The main health and safety hazards identified as likely to arise during the *works* and details of precautionary measures to be taken, together with a statement of specific method statements and assessments of risks.
 - The principle technical standards and guidance notes appropriate to the hazards identified.
 - The management structure and approach to health and safety to be adopted by the *Contractor*.
 - Details of the *Contractor's* health and safety procedures, and procedures for reporting and investigating accidents and incidents.
 - Names, qualifications and experience of the *Contractor's* proposed safety, health and welfare representatives.
 - Methods of assessing the competence of sub-*Contractors*.
 - Arrangements for issuing health and safety directions.
 - Procedures for informing sub-*Contractors* and employees on Health and Safety hazards.
 - Procedures for the communications between the project team, sub-*Contractors* and Site operatives.
 - Arrangements for co-operation and co-ordination with sub-*Contractors*.
 - Procedures for managing design work carried out during the construction phase.
 - Arrangements for welfare facilities.
 - Procedures for review and audit of work in progress to confirm that the *works* are in compliance with the procedures required to minimise the hazards identified in the risk assessment.



- (2) The *Contractor* continuously reviews, amends and extends the Health and Safety Plan to incorporate additional items identified to be a risk to health and safety. The amended and/or extended Health and Safety Plan shall provide for the management of health and safety of all persons on or carrying out the works, also of persons adjacent to any areas where work is being, or will be carried out.
- (3) The *Contractor* keeps a copy of the Health and Safety Plan on Site at all times.

WI 1115.1 Site Safety Officer

- (1) The *Contractor* appoints a designated Site Safety Officer. Such person is to be notified to the *Project Manager* together with his position and frequency of visits to Site. The Site Safety Officer attends Site safety meetings as required and the Pre-Start Health and Safety meeting.
- (2) The *Contractor* provides such welfare and safety measures and amenities required by the nature and situation of the *works* up to a suitable Site safety standard based on the CDM Regulations, both for his workpeople and those of his sub-contractors.
- (3) The *Contractor* ascertains and complies with the requirements of the DLR, Network Rail and London Underground in respect of safety precautions to be taken during construction, having regard to the nature of the *works* to be executed.
- (4) The *Contractor* ensures regular visits and inspections by his nominated Site Safety Officer.

WI 1120.1 Health & Safety File

- (1) The *Contractor* provides the *Project Manager* with two hard copies and two electronic copies on disc (in an agreed format) of the Health and Safety file containing:-
 - Record drawings and plans used and produced throughout the construction process along with the design criteria
 - General details of the construction methods and materials used
 - Details of the structure's equipment and maintenance facilities
 - Maintenance procedures and requirements for the structure
 - Manuals produced by specialist *Contractors* and suppliers which outline operating and maintenance procedures and schedules for plant and equipment installed as part of the structure
 - Conformance certificates, test records and all stator documentation.
 - Details of the location and nature of utilities and services, including

emergency and fire fighting systems

WI 1125.1 Safety Training

- (1) All operatives and management on Site employed directly or indirectly by the *Contractor* are to have received such DLR safety training as is appropriate for the work they are required to undertake and are to be made fully aware of the techniques and procedures to be used during the *works* with regard to their own safety and the safety of others.
- (2) The *Contractor* provides a record of training and the relevant certification for all of their Site operatives under their control in order to demonstrate that the operatives are suitably qualified for the operations they are carrying out.
- (3) The *Contractor* arranges regular relevant toolbox talks for his staff, and maintains a register of attendees of these sessions for the *Project Manager* to inspect. The *Contractor* takes a pro-active stance on promoting safety awareness on the Site.

WI 1130.1 Laser Equipment

- (1) Where construction laser equipment is to be used, it shall be used and stored in accordance with BS EN 60825-1 and the manufacturer's instructions. Either Class 1 or Class 2 laser equipment shall be used, ensuring that the laser beam is not set at eye level and is terminated at the end of its useful path. The use of Class 3A and Class 3B laser equipment will not be permitted without the approval of the *Project Manager* and subject to the submission of a method statement on its safe use.

WI 1135.1 Public Safety

- (1) The *Contractor* complies with all statutory requirements with respect to public safety in connection with the *works*.
- (2) The *Contractor* allows for taking all necessary precautions to protect members of the public. This requirement includes ensuring that the Site is adequately protected at all times when workers are absent.

WI 1140.1 COSHH

- (1) Failure to comply with the Control of Substances Hazardous to Health Regulations SI 2002 No. 2677 (COSHH), in addition to exposing employees to risk, constitutes an offence and is subject to penalties under the Health and Safety at Work Act 1974.
- (2) The *Contractor* is obliged to notify the *Project Manager* of any substances to be used in the *works* that are, or may be, classified as hazardous. The *Contractor* is to provide full details of such substances, including the completion of a Materials Hazard Information Data Sheet, storage details and the Risk Assessment for the *works* to be undertaken. These details must be submitted to

the *Project Manager* prior to the use of any hazardous material.

- (3) COSHH assessments will be produced prior to the delivery of any material to Site, and any hazardous materials will be stored in the appropriate containers.

WI 1145.1 Fire Precautions

- (1) The *Contractor* develops a fire evacuation procedure for agreement with the *Project Manager*. The *Contractor* ensures that all of its persons working on Site or who may have authority to visit Site from time to time are aware of this procedure and receive any instruction that may be appropriate.
- (2) The *Contractor* takes all necessary precautions to minimise the risk of fire and prevent personal injury and death, and damage to the *works* or other property, from fire. The *Contractor* shall comply with the latest edition of the Joint Code of Protection from Fire on Construction Sites, 1992 published by the BEC, the Loss Prevention Council and the National *Contractor's* Group, Part 1 of DOE publication "Standard Fire Precautions P5" and all subsequent amendments. The *Contractor* appoints a Site Fire Safety Co-ordinator.
- (3) The *Contractor* ensures that all staff and operatives attend a Site induction with the *Contractor*. Means of escape, fire points, etc. are shown to all operatives during the Site induction process.
- (4) The *Contractor* allows for any other special precautions necessitated by the *Contractor's* method of working. The *Contractor* is responsible for ensuring that his staff and operatives/sub-*Contractors* are aware of the fire procedures while working on the Site and ensure that they comply with the requirements.
- (5) The *Contractor* removes all superfluous inflammable packaging from Site on a daily basis.
- (6) The *Contractor* obtains the consent, in writing, from the *Project Manager*, before storing or using plant, equipment or materials involving risk of fire or posing any hazard to any person and property. The methods employed in storing or using such plant, equipment or materials, and the location of Site, require the approval of the *Project Manager*.
- (7) The *Contractor* provides any additional fire extinguishers on Site as may be required to deal with the *Contractor's* method of working and/or any materials, packaging and equipment brought or stored on Site by the *Contractor*.
- (8) The *Contractor* takes all precautions to prevent the outbreak of fire on the Site arising from the *works*.

WI 1146 HSE KPI reporting

- (1) The *Contractor* shall report its own and its subcontractors HSE performance to TfL on a periodic basis. The data shall be provided in the format prescribed by TfL. The data is to be submitted within 3 days of the TfL accounting period ending.

**WI 1147 Inspections**

- (1) The *Contractor* shall undertake weekly Health and Safety inspections of the Site to monitor performance in respect of health and safety and submit report to *Project Manager* for Acceptance no later than 5 working days following the date of inspection.

WI 1148 Incident Reporting and Investigation

- (1) The *Contractor* reports all incidents, accidents and near miss events which occur during the Contract to the Client in the format approved by the Client.
- (2) The *Contractor* submits an initial written report within forty eight (48) hours and after 7 days a full report detailing the following:
 - Incidents (events that resulted in harm);
 - Near misses/near hits (events that could have resulted in harm);
 - Sub-standard conditions (hazards that have the potential to cause harm); and
 - Sub-standard acts (behaviours or work methods that have the potential to cause incident).
- (3) Where serious accidents occur – Major injuries and Dangerous Occurrence (as defined in RIDDOR) - these should be subject to a thorough formal investigation, the Client reserves the right to take part in any investigation led by the *Contractor* and/or in certain instances lead their own investigation. In any case the investigation report will be completed to establish root causes and to a level of detail acceptable at the time to the *Employer* Incidents as described above should be, after the situation has been made safe, reported through the Client's agreed on call and incident reporting arrangements . If there are any doubts about what should be reported the incident should be reported. If the incident is serious enough to warrant press attention – all communications with the press will be via TfL.
- (4) This does not supersede the *Contractors* responsibility for statutory reporting of incidents/accidents.

WI 1149 Sentinel

- (1) Sentinel is a smart competency card system in use across the UK rail industry, overseen by Network Rail. The system will provide real time verification of competencies, medical fitness, drugs and alcohol results as well as tracking workers individual working hours with a view to reducing the exposure to the risks of fatigue.
- (2) The *Contractor* must be a Sentinel Sponsor and the all the *Contractors* staff attending the KAD training school must:-

- i. Be sponsored by the company that they work for
 - ii. Have a valid, in date medical which complies with NR/L2/OHS/00124 (level 1-4) that has been uploaded to Sentinel
 - iii. Have passed a Drugs & Alcohol screen within the last 12 months which has been uploaded to Sentinel
 - iv. Complete the Industry Common Induction (ICI) eLearning (unless the individual already has an in date (ICI competence). The ICI invigilated exam will be undertaken during all Track Awareness & Person in Charge of Worksite courses. Course delegates will be enrolled on the eLearning when booking on to a course
- (3) In addition to the above, staff who hold the Person in Charge of Worksite (PICOW) competence will be required to have a device with the “Sentinel” app installed (available on Apple and Android) for signing workers on and off site.

WI 1150 Non English speaking Workers

- (1) The *Contractor* has adequate arrangements in place to communicate health and safety information to non-fluent English speakers on site such that they receive the required safety training/briefing (including any emergency procedures before commencing work; instructions are effectively communicated to, and understood by, all such team members.

WI 1160 Public Safety

- (1) The *Contractor* complies with all statutory requirements with respect to public safety in connection with the works.
- (2) The *Contractor* allows for taking all necessary precautions to protect members of the public. This requirement includes ensuring that the Site is adequately protected at all times when workers are absent.

WI 1170 Environment

WI1170.1 General

- (1) The *Contractor* complies with all current environment legislation and with all current regulations with the following.

WI1170.2 Pollution.

- (1) The *Contractor* complies with all current statutory rules and regulations regarding pollution arising from the *works* and shall ascertain what requirements, restrictions or consents, if any, apply to the *works* in this respect. The *Contractor* complies with any such requirements, restrictions or consents.
- (2) If in the opinion of the *Project Manager* any of the arrangements for control of



pollution are inadequate the *Project Manager* reserves the right to require the *Contractor* to implement such other arrangements as the *Project Manager* directs or to otherwise arrange the necessary remedial action and to set off such costs against monies due to the *Contractor*.

- (3) The *Contractor* shows within his method statement the measures that he will take to ensure that pollution protection requirements are met.
- (4) The *Contractor* does not interfere with or otherwise injuriously affect in any way possible or any watercourse or water supply.
- (5) The *Contractor* indemnifies the *Employer* against any expense, liability, loss, claim or proceedings whatsoever in respect of contamination, damage, noise, vibration, fumes, dust, smoke and other nuisance and any alleged nuisance or any negligence on the part of the *Contractor* or his sub-*Contractors* arising out of or in the course of or by reason of the carrying out of the works.
- (6) If in the opinion of the *Project Manager* any of the arrangements for control of noise, fumes, pollution and all other statutory obligations are inadequate the *Project Manager* reserves the right to arrange the necessary remedial action and to set off such costs against monies due to the *Contractor*.



WI 1170.2 Control of Pollution Act 1974

- (1) The *Contractor* complies with the Control of Pollution Act 1974.
- (2) The *Contractor* complies with any notices served upon him, or upon the *Employer* by any Local Authority under Sections 60 and 61 of the Control of Pollution Act 1974 (hereinafter in this clause referred to as “the said Act”) or under Section 68 of the said Act.
- (3) The *Contractor* makes all applications and obtain all such consents as are required under Sections 60 and 61 of the said Act and he shall comply with all or any conditions or limitations that may be imposed by any Local Authority on the granting of such consents.
- (4) If the *Contractor* shall be guilty of any offence under Sections 60 and 61 aforesaid, the *Contractor* pays all fines imposed by the Court or Courts by which he has been convicted, and the *Contractor* is not indemnified by the *Employer* in respect of any such fines.
- (5) The *Contractor* informs the *Project Manager* in writing of any contravention of Sections 60 and 61 of the said Act or British Standard whether by himself, his servants or agents or by his sub-*Contractors* or suppliers, their servants or agents, within 24 hours of any such contravention. The *Employer* has power thereupon or upon the said contravention coming to his notice, to issue such instructions as he may think fit to abate, or halt any such contravention and the *Contractor* complies with such instructions at his own cost. The *Contractor* is not be entitled to an extension of time for delays caused by such compliance.
- (6) The *Contractor* shall take all necessary measures for all pollution control, with particular reference to plant and equipment, and must address these issues in his Method statements.
- (7) The *Contractor* does not burn rubbish on the Site.
- (8) The *Contractor* takes all reasonable endeavours to meet the *Employer's* environmental standards and to ensure his prospective sub-*Contractors* and suppliers have the same obligation.

WI 1171 Waste Reporting

- (1) The *Employer* uses the BRE's SMART Waste online reporting system for recording waste data and tracking performance against corporate targets. The *Contractor* is encouraged to register with and use the SMART Waste system to record data about the volumes of waste generated, reused/recovered/recycled, and to assist with complying with their Duty of Care requirements. However, with the approval of the *Project Manager*, the *Contractor* may use another system or template (e.g. the WRAP Netwaste tool and WMP template) as long as it helps deliver demonstrable improvements in waste and materials management, demonstrates compliance with legal duty of care obligations and shows progress against the waste targets.



- (2) The *Contractor* shall report the following information each period:
- Total amount of waste produced (non-hazardous and hazardous) - tonnes
 - Total amount of hazardous waste produced - tonnes
 - Amount of waste reused, recycled or recovered (i.e. diverted from landfill) - tonnes
- (3) The *Contractor* shall also report performance against the waste targets set out above. If the amounts of waste reused, recycled or recovered fall below the stated targets, the *Contractor* shall include an explanation of why this has occurred, and the measures that will be implemented to improve performance to the required levels.

WI 1190 Work Related Road Risk

WI 1190.1 Definitions

- (1) The following terms have the following meanings:

“Bronze Accreditation”	the minimum level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk
“Car-derived Vans”	a vehicle based on a car, but with an interior that has been altered for the purpose of carrying larger amounts of goods and/or equipment;
“Collision Report”	a report detailing all collisions during the previous 12 months involving injuries to persons or fatalities;
“Delivery and Servicing Vehicle”	a Lorry, a Van or a Car-derived Van;
“Driver”	any employee of the <i>Contractor</i> (including an agency driver), who operates Delivery and Servicing Vehicles on behalf of the Service Provider while delivering the Services;
“DVLA”	Driver and Vehicle Licensing Agency;



“FORS”	the Fleet Operator Recognition Scheme, which is an accreditation scheme for businesses operating van and lorry fleets. It offers impartial, independent advice and guidance to motivate companies to improve their compliance with relevant laws and their environmental, social and economic performance;
“FORS Standard”	the standard setting out the accreditation requirements for the Fleet Operator Recognition Scheme, a copy of which can be found at: www.fors-online.org.uk
“Gold Accreditation”	the highest level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk
“Lorry”	a vehicle with an MAM exceeding 3,500 kilograms;
“MAM”	the maximum authorised mass of a vehicle or trailer including the maximum load that can be carried safely while used on the road;
“Side Guards”	guards that are fitted between the front and rear axles of a Lorry and that comply with EC Directive 89/297/EEC and the Road Vehicles (Construction and Use) Regulations 1986;
“Silver Accreditation”	the intermediate level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk
“Van”	a vehicle with a MAM not exceeding 3,500 kilograms.

WI 1190.2 Fleet Operator Recognition Scheme Accreditation.

- (1) Where the *Contractor* operates Freight Vehicles, the *Contractor* within 90 days of executing the Contract:



- (unless already registered) register for membership of FORS or a scheme, which in the reasonable opinion of the *Employer*, is an acceptable substitute to membership of FORS (the “Alternative Scheme”); and
- (unless already accredited) have attained the standard of Bronze Membership of FORS (or higher) or the equivalent within the Alternative Scheme and shall maintain the standard of Bronze Accreditation (or equivalent standard within the Alternative Scheme) by way of an annual independent assessment in accordance with the FORS Standard or take such steps as may be required to maintain the equivalent standard within the Alternative Scheme. Alternatively, where the *Contractor* has attained Silver or Gold Standard, the maintenance requirements shall be undertaken in accordance with the periods set out in the FORS Standard.

WI 1190.3 Safety Equipment on Vehicles

- (1) The *Contractor* ensures that every Lorry, which it uses to provide the *works*:
- has Side Guards, unless the *Contractor* can demonstrate to the reasonable satisfaction of the *Employer* that the Lorry will not perform the function for which it was built if Side Guards are fitted;
 - has a front, side and rear blind spots completely eliminated or minimised as far as practical and possible, through the use of fully operational direct and indirect vision aids and driver audible alerts; and
 - has equipment fitted with an audible means of warning other road users of the Lorry’s left manoeuvre; and
 - has prominent signage on the Lorry to warn cyclists and other road users of the dangers of passing the Lorry on the inside and of getting too close to the Lorry.

WI 1190.4 Driver Licence Checks

- (1) Where the *Contractor* operates Delivery and Servicing Vehicles to provide the *works* the *Contractor* ensures that:
- The *Contractor* has a system in place to ensure all its Drivers hold a valid driving licence for the category of vehicle that they are tasked to drive, along with recording any endorsements, or restrictions on the Drivers licence; and
 - each of its Drivers engaged in the provision of the *works* has a driving licence check with the DVLA or such equivalent before that Driver commences delivery of the *works* and that the driving licence check with the DVLA or equivalent authority is repeated in accordance with either the following risk scale (in the case of the DVLA issued licences only), or the *Contractor*’s risk scale, provided that the *Contractor*’s risk scale has been Approved in writing by the *Employer* within the last 12 months:
 - (i) 0 – 3 points on the driving licence – annual checks;



- (ii) 4 – 8 points on the driving licence – six monthly checks;
- (iii) 9 – 11 points on the driving licence – quarterly checks; or
- (iv) 12 or more points on the driving licence – monthly checks.

WI 1190.5 Driver Training

- (1) The *Contractor* ensures that each of its drivers who has not undertaken:
- undergoes approved progressive training (to include a mix of theoretical, e-learning, practical and on the job training) and continued professional development to include training covering the safety of vulnerable road users and on-cycle hazard awareness, throughout the term of the Contract.
 - a FORS e-learning safety module in the last 12 months, undertakes a FORS e-learning safety module (or an equivalent safety module provided by the Alternative Scheme).

WI 1190.6 Collision Reporting

- (1) Where the *Contractor* operates Delivery and Servicing Vehicles to Provide the Works, the *Contractor*:
- ensures that it has a system in place to capture, investigate and analyse road traffic collisions that results in fatalities, injury or damage to vehicles, persons or property and for generating Collision Reports; and
 - within 15 days of the Commencement Date, provides to the *Employer* a Collision Report. The *Contractor* provides the *Employer* with an updated Collision Report within five working days of a written request from the *Employer*.

WI 1190.7 Self Certification of Compliance

- (1) Within 30 days of the Commencement Date and where the *Contractor* operates Delivery and Servicing Vehicles to Provide the Works, the *Contractor* provides a written report to the *Employer* detailing its compliance with clauses 18.4, 18.5 and 18.6 of this Contract (the “WRRR Self-certification Report”). The *Contractor* provides the *Employer* with updates of the WRRR Self-certification Report on each three month anniversary of its submission of the initial WRRR Self-certification Report.

WI 1190.8 Obligations of the *Contractor* Regarding Subcontractors

- (1) The *Contractor* shall ensure that those of its sub-*Contractors* who operate Delivery and Servicing Vehicles to provide the works shall comply with all relevant parts of this WI1190 as if those sub-*Contractors* were a party to this contract.

WI 1190.9 Failure to Comply with Work Related Road Risk Obligations



- (1) Without limiting the effect of any other clause of this Contract relating to termination, if the *Contractor* fails to comply with the relevant parts of this WI 1190.
- the *Contractor* has committed a material breach of this Contract; and
 - the *Employer* may refuse the *Contractor*, its employees, agents and Delivery and Servicing Vehicles entry onto any property that is owned, occupied or managed by the *Employer* for any purpose (including but not limited to deliveries).

WI 1200 SUB-CONTRACTING

WI 1205 Restrictions for Subcontracting

WI1205.1 Specific Requirements

- (1) The *Contractor* only sub-contracts any part of the *works* as per clause 26 of the *conditions of contract* and with the prior written approval of the *Project Manager* provided always that the *Contractor* remains fully responsible for such parts of the *works*. The *Contractor* does not sub-contract any part of the *works* where the *Employer* makes a reasonable objection to the sub-contracting of that part.
- (2) The *Contractor* engages all subcontractors and suppliers on terms consistent with the terms of this contract and on terms that oblige the Subcontractors and suppliers to comply with the terms of its sub-contract in a manner which enables the *Contractor* to comply with its contract obligations under the contract.

WI1210 Requirements for all Subcontracts

- (1) The *Contractor* ensures that each subcontract he lets in relation to this contract contain provisions:
- requiring the proposed Subcontractor (and sub-subcontractors of any tier) to meet the Conditions stated for any Key Date on or before such Key Date and to achieve Completion on or before the Completion Date and to minimise the level of Defined Cost,
 - requiring the proposed Subcontractors (and sub-subcontractors of any tier) to assign to the *Employer* the IPR in all documents, drawings, materials, computer software, licences and any other material or *works* prepared or developed by or on behalf of the proposed Subcontractor in the performance of the subcontract,
 - requiring the proposed Subcontractor (and sub-subcontractors of any tier) to grant a non-exclusive, perpetual, irrevocable, royalty-free licence to the *Employer* to use Background IPR (including the right to grant sub-licences) of an equivalent extent and nature to those required by this contract,



- imposing equivalent obligations of confidentiality on the proposed Subcontractor (and sub-subcontractors of any tier) to those required by this contract,
- imposing equivalent obligations regarding Prohibited Acts and health and safety (including Safety Breaches) as required by this contract on Subcontractor (and sub-subcontractors of any tier),
- in equivalent terms to the payment clause of this contract together with an obligation to procure that equivalent provisions are included in sub-subcontracts of any tier,
- imposing equivalent obligations regarding London Living Wage on the proposed Subcontractor (and sub-subcontractor of any tier) to those required by this contract,
- imposing equivalent obligations regarding Freedom of Information Act on the proposed Subcontractor (and sub-subcontractor of any tier) to those required by this contract,
- imposing equivalent obligations regarding criminal record declarations on the proposed Subcontractor (and sub-subcontractor of any tier) to those required by this contract,
- in equivalent terms to clause 50 in *conditions of contract* together with an obligation to procure that equivalent provisions are included in sub-subcontracts of any tier,
- requiring the Subcontractor to comply with the provisions of assignment and novation of this contract,
- imposing equivalent rights to terminate the Subcontract and any sub-subcontract (together with equivalent provisions in relation to the amounts due in the event of such termination) to those contained in this contract,
- requiring the Subcontractor to maintain *Employers* liability, and where relevant, motor liability and professional indemnity insurance in accordance with this contract,

WI 1215 Submission of Subcontract Documentation

- The *Contractor* submits to the *Project Manager* for acceptance a schedule of all proposed subcontracts that the *Contractor* intends to place, or series of subcontracts with the same Subcontractor, together with a copy of the proposed subcontract scope and subcontract documentation and such other information as the *Project Manager* may require.
- The *Contractor* includes in the proposed schedule of subcontracts all proposals to let *works* to any associated, affiliated or subsidiary companies of the *Contractor* and the *Contractor's* group of companies.

WI 1220 Acceptance Procedures

- The acceptance procedures set out in clause 26 of the *conditions of contract* apply.



WI 1225 The Subcontract Procurement Plan

Not Used

WI 1230 Responsible Procurement

- The *Contractor* complies with TfL’s policies in respect of Responsible Procurement, Ethical Sourcing and Sustainable Timber.

WI 1300 TITLE

WI 1300.1 Specific Requirements

- (1) The *Contractor* has no title to equipment or to any other items removed from the existing station as part of the works. The *Contractor* carefully removes all such equipment and items and
 - a. Where equipment or other items are to be reinstalled as part of the works, the *Contractor* is responsible for their safe storage and
 - b. Where equipment or other items are not to be reinstalled as part of the works, the *Contractor* delivers them to the *Employer* as directed by the *Project Manager*.

WI 1305 Marking

- (1) All Plant and Materials which are easily detachable are to be marked as ‘Property of DLR’ unless the *Project Manager* has agreed that marking is not required.

WI 1310 Disposal of Materials from Site

- (1) Unless otherwise stated in the Works Information, the benefits of credit for sale of all redundant materials removed from the Site are to the benefit of the *Employer*.

WI 1400 DOCUMENTATION

WI1410 Insurances and Warranties

- (1) The *Contractor* provides the insurances required in the Contract Data and as required by law, including without limitation, insurance of all his plant, tools, equipment, temporary works, *Employer* liability, public liability and professional indemnity cover in respect of all design carried out by the *Contractor*.



- (2) The *Contractor* provides evidence that a valid and in-date policy of insurance is in place for each required insurance. Further evidence may be required by the *Employer* from time to time to ensure that the policy cover remains in place.

WI 1415 Parent Company Guarantee.

- (1) If the *Contractor* is not the ultimate holding company, the *Contractor* provides a Parent Company Guarantee from its ultimate holding company in a form provided by TfL.

WI 1500 ACCOUNTS AND RECORDS

Not Used

WI 2000 EMPLOYER'S WORKS SPECIFICATIONS AND DRAWINGS

WI 2000.1 *Employer's Requirements.*

- (1) This WI 2000 sets out the *Employer's Requirements*, which the *Contractor* is responsible to construct and complete.
- (2) The descriptions of items of work or requirements contained or referred to herein are not intended to limit or exclude anything that a competent *Contractor*, experienced in carrying out *works* of similar size, scope, nature and complexity to the *works* ought reasonably to have known would be required to construct the *works*.
- (3) The *Employer's Requirements* are contained in the following lists of Documents which are included at Annexure 3:
- a. Technical Specification 19109-DLR-LAE-T255_Z-SP-LE-0001; and
 - b. Technical Specification 19109-DLR-LAE-T735_Z-SP-LE-0001

WI 2010 DLR Specifications & Standards

WI 2010.1 The *Contractor* ascertains and complies with all standards that are required to comply with the Works Information.





Annexure 1
BIM Protocol



Engineering Standard

Mandatory

DLR BIM Standard

Reference: **DLR-ENG-STD-ES104**

Issue: **2.0**

Issue date: **August 2018**



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4.1	Standard method and procedure.....	- 3 -
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2 Introduction

This document is based on BS1192 - Collaborative production of architectural, engineering and construction information - and this edition has been substantially updated to reflect the changes introduced by Amendments 1 (2015) and 2 (2016) and the related sister documents

- PAS1192-2 (Information Management of Delivery Phase),
- PAS1192-3 (Operational Phase),
- BS1192-4 (Collaborative Production of Information)
- PAS1192-5 (Security) and
- PAS1192-6 (Health and Safety)

The standards should be considered for all projects and are particularly applicable where technology enabled processes are used to support them. These processes include:



- Automation of 3D model data, drawing and document production,
- Indexing and searching project material
- Filtering and sorting
- Quality checking and document comparisons.

3 Scope and Application

This document applies to organisations and individuals responsible for the procurement, design, construction, delivery, operation and maintenance of buildings (vertical), civil (ground covering) and infrastructure (linear) assets.

Where possible, generic language has been used, but where needed, a list of definitions is provided at the end of this document.

4 Collaboration Management Processes

4.1 Standard method and procedure

Projects are required to follow a common set of generic processes at the highest level, which are fine-tuned on a project-by-project basis and which apply to all approaches to project design production, and co-ordination of the information model.

5 General Project Issues

The project “standard method and procedure” should be agreed and committed to by all the relevant parties involved in the project (e.g. the client, design consultants, supply chain partners, etc.) at the pre-construction contract stage in the project lifecycle. This will be represented by the Employer’s Information Requirements and in due course responded to by the BIM Execution Plan.

To implement the “standard method and procedure” the following elements should be in place:

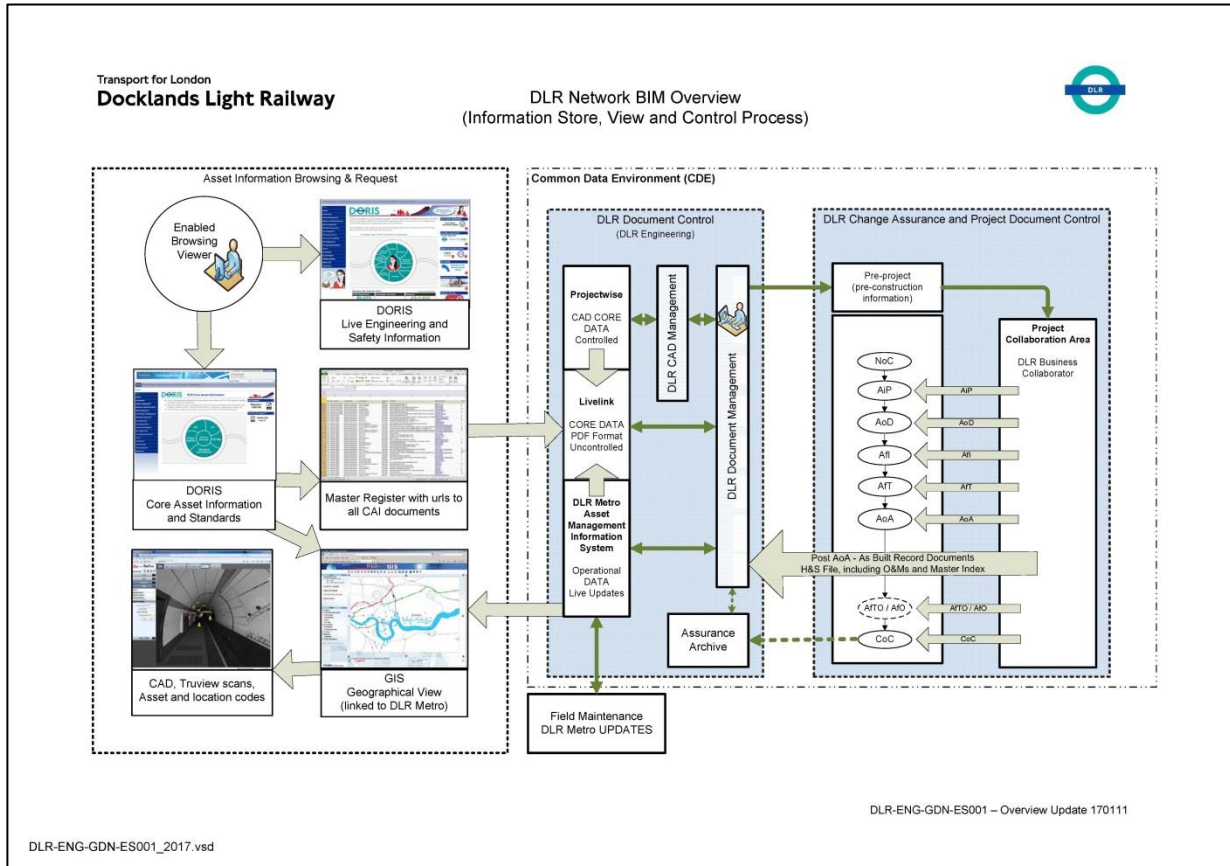
- Roles and responsibilities should be agreed, in particular the responsibility for design co-ordination of the various design disciplines.
- Naming conventions should be adopted - in accordance with DLR-ENG-GDN-ES003 and DLR-ENG-GDN-ES004
- Arrangements should be in place to create and maintain the project specific codes as described in DLR-ENG-GDN-ES004
- A “Common Data Environment” (CDE) approach should be adopted to allow information to be shared between all members of the project team.
- A suitable information hierarchy should be agreed that supports the concepts of the CDE as illustrated in DLR-ENG-GDN-ES001.

5.1 Process and the Common Data Environment

The phases of the CDE defined by BS1192 are:

1. Work in Progress
2. Shared
3. Published Documentation and
4. Archive

DLR has integrated assurance gates as shown in the system diagram DLR-ENG-GDN-ES001 below.



The Project CDE may be TfL’s Asite or DLR’s Business Collaborator (BC). Each version must follow the assurance based workflow detailed in Appendix 1. The document distribution process to match Appendix 1 has been built in to BC, .

5.2 Work in Progress.

The WIP area of the CDE is where members of the project team carry out their own work using their organisation’s software systems. Whether the common repository or an organization’s in-house repository is used, the models and documents should employ a similar management process as that used for the total project. The organisation is responsible for the quality of the WIP information and should ensure that appropriate checking and review processes are in place.

5.3 Shared.

When data is SHARED with the other members of the project team, the data is



checked and issued to the CDE and the revision code is updated to indicate a major revision e.g. P01.

When a model has reached a stage that is suitable for coordination it should be made available in the shared area of the CDE. This may be Projectwise for CAD teams or Business Collaborator for the wider project team.

The “issue” status should be used to identify the suitability of the information provided. The “suitability” code (see 15.2.2) gives ownership to the design teams and restricts access by others until information is sufficiently developed, co-ordinated, approved and authorised.

Models that are downloaded by others should never be re-uploaded to the SHARED area. When a model is used as background information by others, it is important to ensure that this does not result in information in models being duplicated. Therefore, a procedure should be agreed that ensures information occurs only once in the SHARED area.

5.4 Documentation

Before information in the SHARED area of the CDE is made available to the wider project team, for example for tender or construction, it should be formally checked, approved and authorized.

Checking and approvals processes should be defined in the execution plan and applied. Where Business Collaborator is used, use of the built-in sign-off processes is encouraged.

The TfL wide suitability codes are defined in DLR-ENG-GDN-ES004, BIM CAD Guidance.

The DLR Numbering Tool – DLR-ENG-GDN-ES003 – provides compliant numbers for any project document and lists them on a register which can be copied to the H&S File Template – DLR-ENG-GDN-ES007a - on completion.

The Asset Capture Sheet – DLR-ENG-GDN-ES008 – has been designed to interface with DLR Metro Maximo and requires existing asset information to be provided on project commencement and new to be provided on completion.

5.5 Archive

BS1192 requires a process to be in place to enable the continued availability of the archive area information, subsequent to the design and construction phases to support the following:

1. History of the transfer of the project information;
2. Change audits;
3. Asset register;
4. Models;
5. Documents;
6. Legal purposes, e.g. Health and safety file

DLR-ENG-GDN-ES001 illustrates the DLR systems used. 1, 2, 5 and 6 are managed by Livelink; 3 by DLR Metro Maximo and 4 by Bentley Projectwise



6 Naming of containers

All information returned at the end of a project must have attached metadata that defines the structure in Projectwise and Livelink where it will be stored. The fields are:

- | | |
|-------------------|----------------------|
| 1. Project Name | 9. Organisation |
| 2. Project No | 10. LCS Code |
| 3. Document No | 11. Classification |
| 4. Document Title | 12. Purpose of issue |
| 5. Type | 13. Grid System |
| 6. Level | 14. Date |
| 7. Asset Class | 15. Status |
| 8. Role | |

DLR's requirements for these are covered in DLR-ENG-GDN-ES004_BIM CAD Guidance.

7 Project Space Statement

7.1 General

All models, whether 2D or 3D, should be created using a common project origin and orientation using a conventional Cartesian axis and common unit of length. The statements given in A.2 to A.4 should be included with the project dictionary, and refined as necessary. Models should be created at 1:1. Units should be SI units of measure.

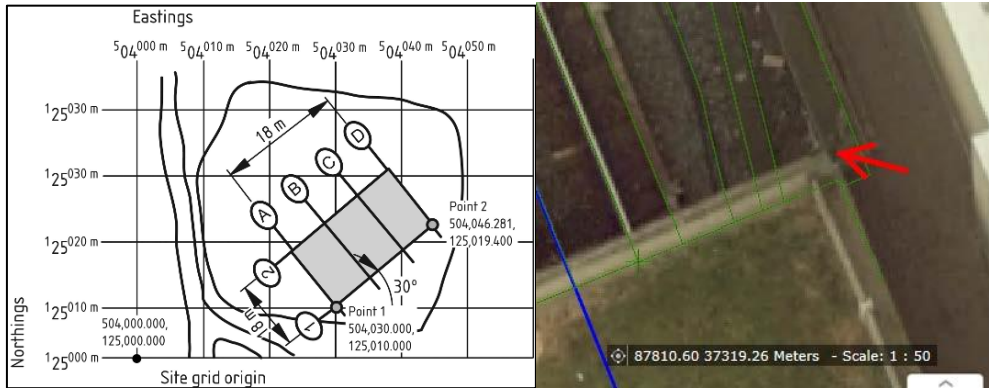
The basic unit of length within models is metres; this is set by use of the DLR seed files..

7.2 Space

A statement or diagram of the project origin and orientation should be included with the project dictionary. The origin should be related to both the project grid and to the site context. The orientation should be related to London Survey Grid. NOTE The project origin is best located within or close to the project or site extent.

7.3 Geospatial

A statement or diagram should relate the project space to the TfL global geospatial system in three dimensions (decimal degrees latitude, longitude and elevation in metres) and a plan orientation (decimal degrees clockwise rotation from north). The figures below illustrate how this information is provided by the DLR/TfL GIS system..



1. Standard requirement.

2. GIS Provision in London Survey Grid

8 Quality management

8.1 Quality policy

DLR subscribes to a quality policy that ensures that models are maintained over their lifetimes. At the outset of any project all facets of the organisation of the project's graphical database should be formulated by the authors of the data with a view to satisfying end users.

Models, which need to be maintained over long periods of time, might be subject to both major and minor updates and the same in-house standards should be applied to these amendments in order to ensure model integrity is preserved.

In-house standards should be published and regularly reviewed, for example, at the adoption of each new software release. When models are to be extended to cover new topics, consideration should be given to the strategy adopted for structuring the new information and the way it will be integrated. Sustained data quality requires methodical checking at the time of input and persistent discipline when changes are made.

Data quality should be checked systematically. This should include:

- a. elimination of spurious data outside normal file extents or limits;
- b. checks on file set-up parameters;
- c. testing of container allocations by switching on and off containers;
- d. listing of containers;
- e. elimination of information which is not to scale;
- f. purging of all unnecessary data;
- g. elimination of references to un-checkable (i.e. uncontrolled) files such as renditions;
- h. formats that do not maintain dimensional integrity should not be used;
- i. other content checks.

8.2 Data exchange

To avoid problems associated with data exchange, participants in the exchange process should:



- a. follow the recommendations given in this standard;
- b. agree as early as possible which data should be exchanged when and in what format.
- c. agree the version of format to be used for data exchange;
- d. establish procedures to test, monitor and report the accuracy of the data transfer, and conduct initial data transfer trials;
- e. agree a method of recording each issue and receipt of digital data and what constitutes an acceptable transfer.

9 Differences between British and international standards

Where there is substantial international project involvement, BS1192 recommends the use of a simpler, ISO compatible, layer naming and coding strategy, to minimize the number of different layers used and reduces complexity when data are exchanged between the different parties to a project.

CAD QA checks for DLR and TfL are carried out using Bentley Projectwise. This is considered to be both international and straightforward and variations would not normally be acceptable.

Uniclass 1.4 is used and is embedded in the library files.

10 Interfaces with Health and Safety Issues

PAS1192-6 provides recommendations for the integration of hazard and risk information within BIM systems such that there is greater awareness at design stage of the construction hazards being introduced.

DLR has a structured approach to risk headed by a network risk model, operational and engineering risk registers and operational works that follow procedures detailed in the Working on the Railway Manual. All procedures require method statements and associated risk registers to be completed.

In order to illustrate potential hazards it is important that the temporary conditions of any change are illustrated alongside existing and final. This requires that a designer must have a clear understanding of method and 4D illustration.



11 Background and Context of the DLR BIM Standard.

In May 2011, the UK Government published the Construction Strategy aimed at reducing the cost of public sector assets.. The strategy called “for a profound change in the relationship between public authorities and the construction industry to ensure the Government consistently gets a good deal and the country gets the social and economic infrastructure it needs for the long-term”.

Basic problems exist with procuring public assets, which have been known for over 100 years, but little as yet has been achieved in resolving them. The Government’s Construction Strategy defined a number of strategic objectives, which it considered could help eliminate excessive cost and waste if the standards, processes and procedures outlined in BS 1192:2007, and mirrored in this document, are implemented.

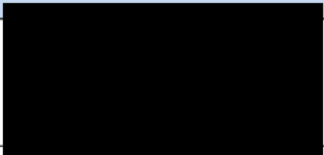
The DLR BIM Standard borrows heavily from and is intended to satisfy the ethos of BS1192 and its related PAS codes of practice. It has been adapted to align with TfL’s BIM methodologies, and as such should be read in conjunction with;

- DLR BIM Quick Reference Guide, DLR-ENG-GDN-ES104
- DLR BIM Document Control Guidance, DLR-ENG-GDN-ES002.
- DLR BIM Document Numbering Guidance, DLR-ENG-GDN-ES003 (Template)
- DLR BIM CAD Guidance, DLR-ENG-GDN-ES004.
- DLR BIM IT Configuration Guidance, DLR-ENG-GDN-ES005.
- DLR BIM Design Collaboration Guidance, DLR-ENG-GDN-ES006.
- DLR BIM Health & Safety File Guidance, DLR-ENG-GDN-ES007 (Template)
- DLR BIM Asset Capture Sheet Guidance, DLR-ENG-GDN-ES008 (Template)

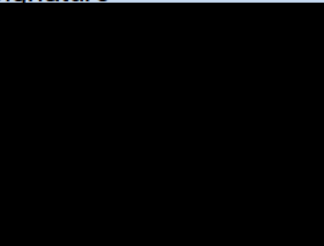
Ongoing developments and references will be illustrated on the [TfL BIM Website](#)..

Where conflict or ambiguity is found to exist between the DLR BIM Standard and its Guidance documents the DLRL BIM Manager’s ruling should be followedl.

12 Custodian

Custodian Name	Signature	Date
Sam Twum-Barima DLRL Head of Engineering		

13 Technical Content Manager

Custodian Name	Signature	Date
Andy Millar DLRL BIM Manager		



14 Document History

Rev	Date	Description
1.0	November 2014	First issue
2.0	August 2018	Issue 2 with general update

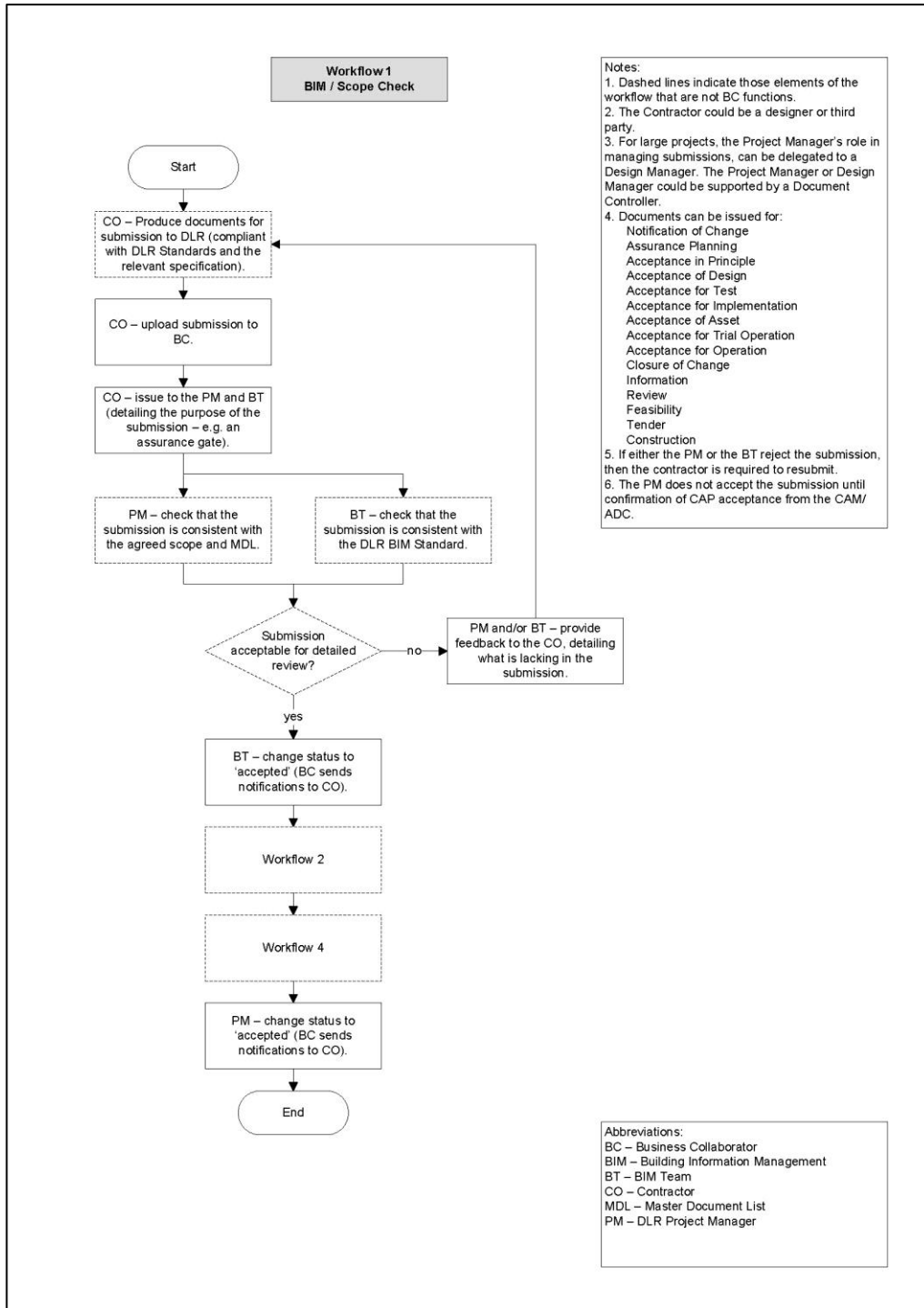


Appendix 1

The 4no charts below represent the project documentation workflows built into Business Collaborator. This workflow is also a default requirement for projects using other forms of common data environment.

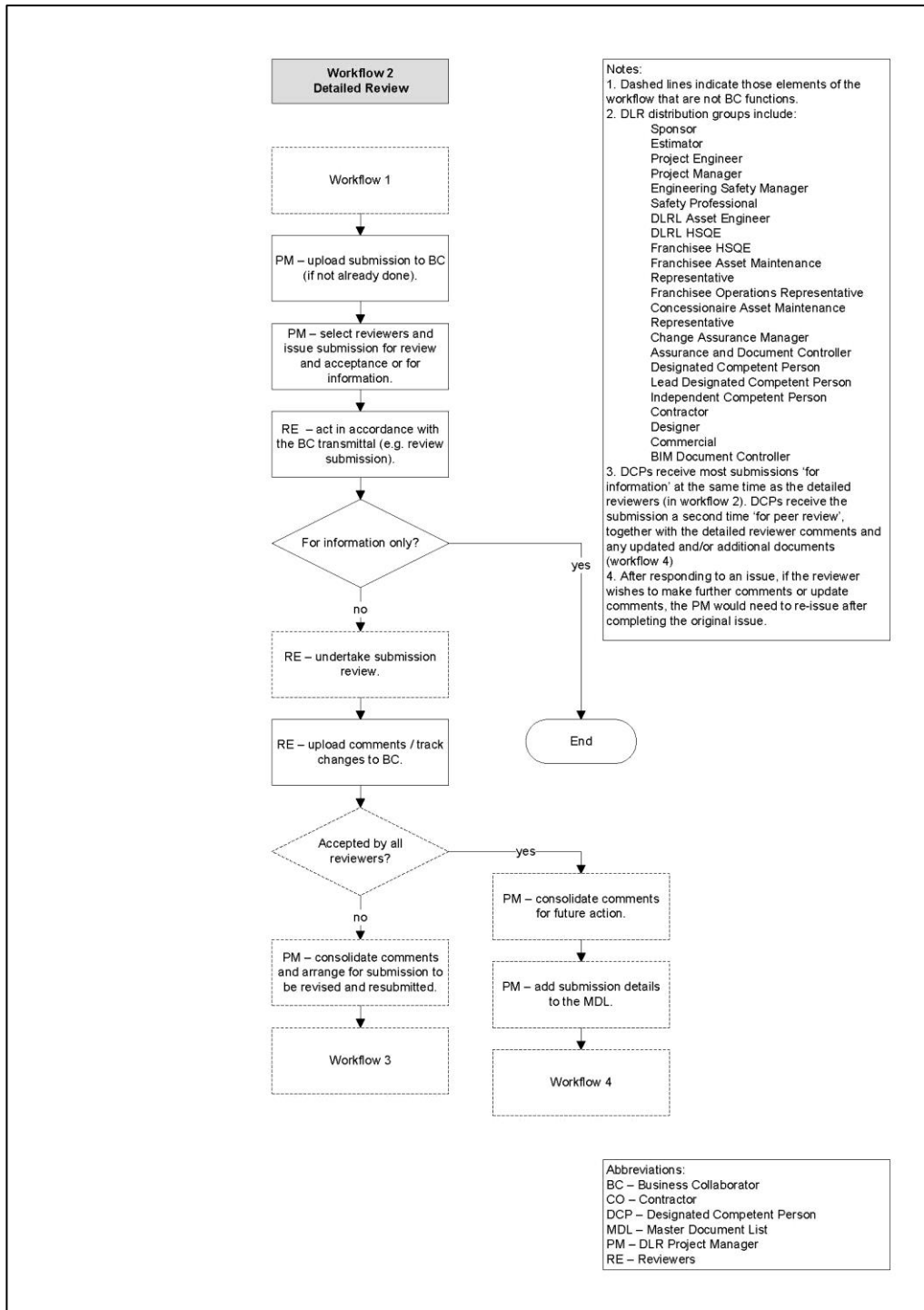
These cover:-

1. BIM quality and Project scope checks;





2. Detailed Review

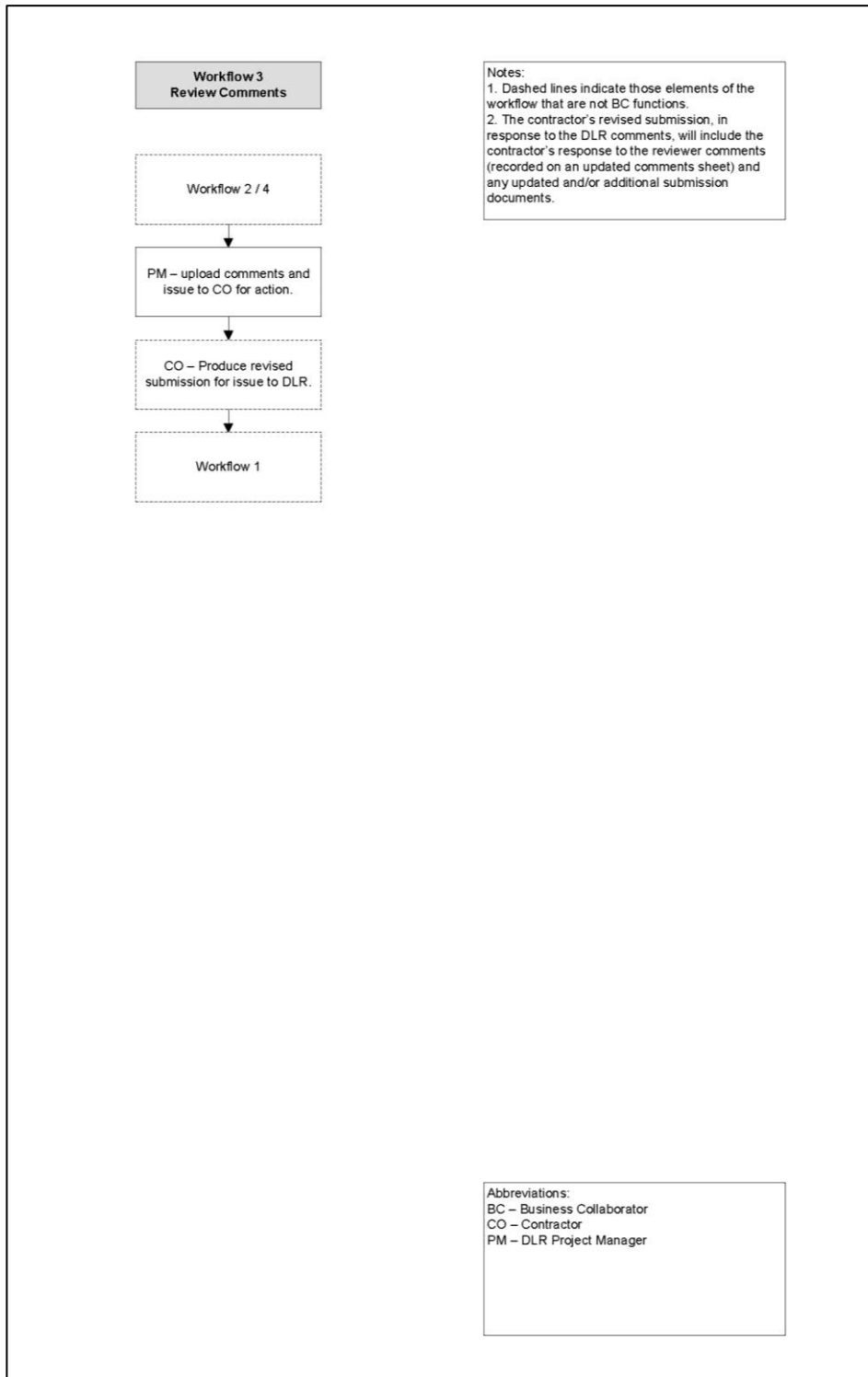


Transport for London

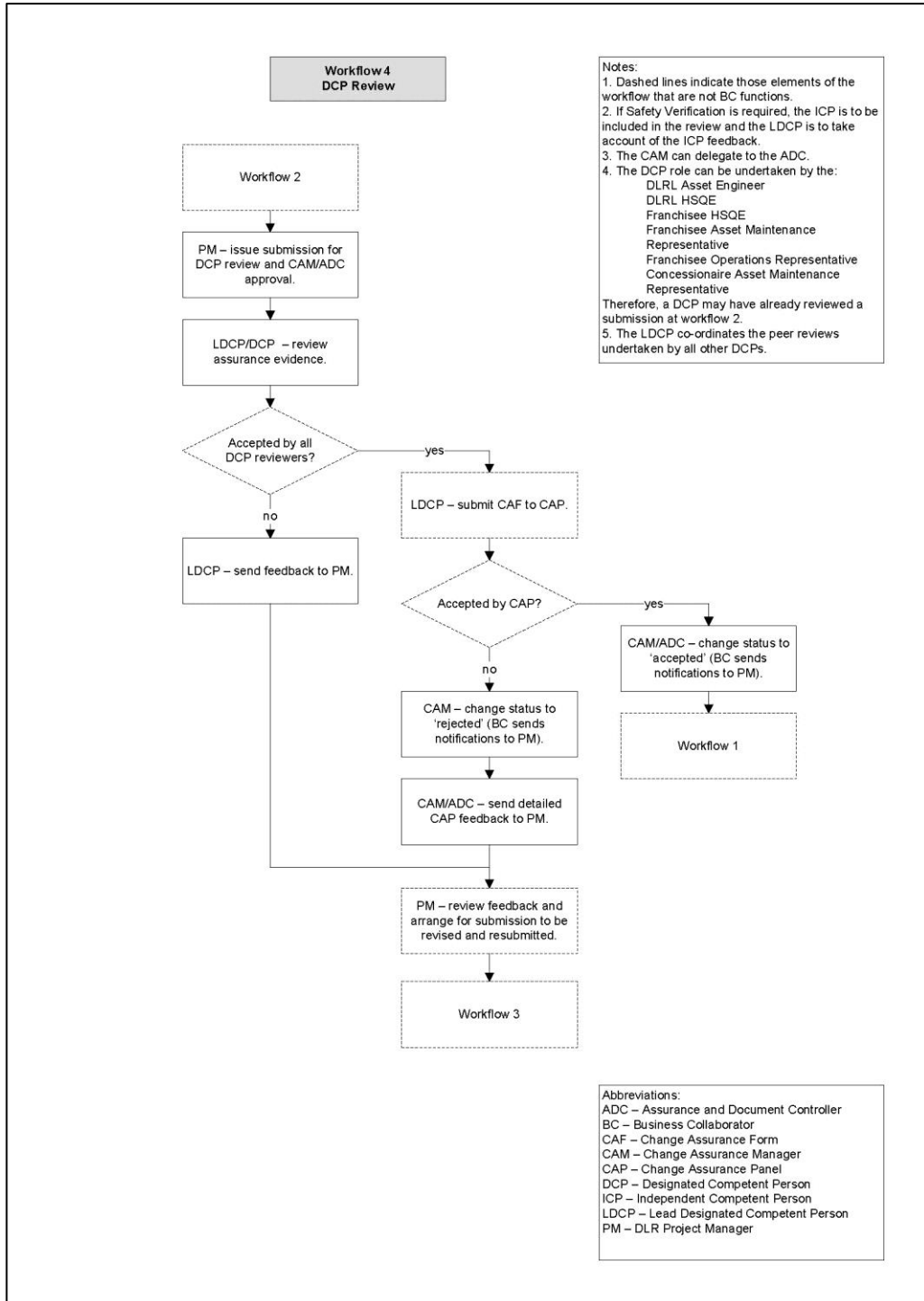
Docklands Light Railway



3. Review Comments



4. Review by Designated Competent Person





Annexure 2

MDL

Change Name:	LCA Escalators	
Version / Revision History	Date	Comments
Version 1.0	10/12/2018	1st Issue

Change Number:	2018-55
<p>Notes: 1. This template list should not be considered exhaustive; additional assurance evidence may be required for the change. 2. Once completed, submit with the Technical Assurance Plan/Statement, for review at the first assurance gate following NoC. 3. This MDL should be updated before each gate. 4. The document reference and issue should be added when known. 5. If there is no AiP gate, the AiP documents marked as to be updated for AoD are to be submitted before the AoD gate. 6. If there is not AiT gate, the Inspection and Test Plan shall be provided at the AoD gate. 7. Key: Y = Document should be produced for the gate U = High likelihood of updates / revisions being required at subsequent gates.</p>	

Document Acceptance	Name	Signature	Date
Custodian: Delivery Manager	Mahul Patel		
Reviewed by: Designated Competent Person	Paul Pinagli		
Accepted by: Change Assurance Manager	Gordon Utting		

- Instructions:
- 1) Add rows and populate the list with change specific assurance documents that are in addition to the generic assurance documents listed.
 - 2) Delete rows for generic assurance documents that are not applicable to the change.
 - 3) Complete the 'Assurance Gate' columns, using the default content as a guide, and add any relevant comments.
 - 4) Based on the programme for the change, propose dates for each assurance gate.
 - 5) State who is responsible for production of each assurance document.

Assurance Documentation		Assurance Gate				Responsibility for Document Production	Comments
Document Ref.	Document Issue	Title	AoD	AoA (Esc 1)	AoA (Esc 2)	CoC	
Acceptance of Design		Planned CAP Date for AoD: TBC					
TBC	TBC	Technical Assurance Plan	Y	Y	Y	Y	DLR
TBC	TBC	Master Document List	Y	Y	Y	Y	DLR
TBC	TBC	Handover Handback Strategy	Y				DLR/Contractor
TBC	TBC	Operations Impact Assessment (Temporary)	Y				KAD
TBC	TBC	Dilapidation Report	Y	Y	Y		Contractor
TBC	TBC	Outline Construction Methodology	Y				Contractor
TBC	TBC	Survey reports for escalator procurement	Y				Contractor
TBC	TBC	Escalator procurement technical specification	Y				Contractor
TBC	TBC	Factory Test Plan - Escalators	Y				Contractor
TBC	TBC	Permenant design reports, calculations, drawings and specifications and associated design check certs - Escalator Design including building interface design - Civils Design - Premises Design - Fire Alarm Design - Building Servies Design - SCADA design	Y				Contractor
TBC	TBC	Temporary design reports, calculations drawings and specifications and associated design check certs - Hoarding Design - Lighting Design - CCTV design - Updated Fire plans - Temporary Signage	Y				Contractor
TBC	TBC	EMC Statement	Y				Contractor
TBC	TBC	Reliability, Availability, Maintainability, and Safety (RAMS) Statement	Y				Contractor
TBC	TBC	Escalator logistics and delivery plan	Y				Contractor
TBC	TBC	Comment sheets	Y				Contractor
TBC	TBC	Construction Health & Safety Plan (including Fire Safety Plan)	Y				Contractor
TBC	TBC	Project Execution Plan	Y				Contractor

Document Ref.	Document Issue	Assurance Documentation				Responsibility for Document Production	Comments
		Title	AoD	AoA (Esc 1)	AoA (Esc 2)		
TBC	TBC	Design Management Plan	Y			Contractor	
TBC	TBC	Designers Risk Assessment	Y			Contractor	
TBC	TBC	Environmental Management Plan	Y			Contractor	
TBC	TBC	Systems Integration Plan	Y			Contractor	
TBC	TBC	Method Statement and Work Request Forms	Y			Contractor	
TBC	TBC	Derogations (if any)	Y			Contractor	
TBC	TBC	Design Check Certificates	Y			Contractor	
TBC	TBC	Quality Control Plan	Y			Contractor	
TBC	TBC	Inspection Test Plans	Y			Contractor	
TBC	TBC	Human Factors Assessment	Y			Contractor	
TBC	TBC	Familiarisation and Training Plan	Y			Contractor	
TBC	TBC	Details of Baseline Asset Information affected by the change	Y			Contractor	
Acceptance of Asset (Escalator 1)		Planned CAP Date for AoA: TBC					
TBC	TBC	Operations Impact Assessment (Permanant)		Y		KAD	
TBC	TBC	Congestion Control & Emergency Plan (CCEP)		Y		KAD	
TBC	TBC	Handback Checklist and Certificate		Y		DLR/KAD/Contractor	
TBC	TBC	Factory Acceptance Test		Y		Contractor	
TBC	TBC	Site Acceptance Test		Y		Contractor	
TBC	TBC	Inspection and Test Reports		Y		Contractor	
TBC	TBC	Escalator delivery certificates		Y		Contractor	
TBC	TBC	Completed EMC Installation Inspection Evidence		Y		Contractor	
TBC	TBC	EMC Test Report		Y		Contractor	
TBC	TBC	Asset List (New, altered or decommissioned)		Y		Contractor	
TBC	TBC	Human Factors Issues Log		Y		Contractor	
TBC	TBC	Fire Risk Assessment and plans		Y		Contractor	
TBC	TBC	Full list of drawings and documents (Register)		Y		Contractor	
TBC	TBC	Residual Risk Table		Y		Contractor	
TBC	TBC	List of Design Changes (since AoD)		Y		Contractor	
TBC	TBC	Master Snagging List		Y		Contractor	
TBC	TBC	Operation & Maintenance Manual		Y		Contractor	
TBC	TBC	Health and Safety File		Y		Contractor	
TBC	TBC	Construction Compliance Certificate		Y		Contractor	
TBC	TBC	Check Certificates		Y		Contractor	
TBC	TBC	SCADA System Check List:		Y		Contractor	
TBC	TBC	Red-lined drawings and documents		Y		Contractor	
TBC	TBC	Confirmation of completed training and licensing		Y		Contractor	
TBC	TBC	Confirmation of completed procedure updates		Y		Contractor	
TBC	TBC	Stakeholder consultation comments sheets		Y		Contractor	

		Assurance Documentation				Responsibility for Document Production		Comments
Document Ref.	Document Issue	Title	AoD	AoA (Esc 1)	AoA (Esc 2)	CoC		
Acceptance of Asset (Escalator 2)		Planned CAP Date for AoA: TBC						
TBC	TBC	Operations Impact Assessment			Y		KAD	
TBC	TBC	Congestion Control & Emergency Plan (CCEP)			Y		KAD	
TBC	TBC	Handback Checklist and Certificate			Y		DLR/KAD/Contractor	
TBC	TBC	Factory Acceptance Test			Y		Contractor	
TBC	TBC	Site Acceptance Test			Y		Contractor	
TBC	TBC	Inspection and Test Reports			Y		Contractor	
TBC	TBC	Escalator delivery certificates			Y		Contractor	
TBC	TBC	Completed EMC Installation Inspection Evidence			Y		Contractor	
TBC	TBC	EMC Test Report			Y		Contractor	
TBC	TBC	Asset List (New, altered or decommissioned)			Y		Contractor	
TBC	TBC	Human Factors Issues Log			Y		Contractor	
TBC	TBC	Fire Risk Assessment and plans			Y		Contractor	
TBC	TBC	Full list of drawings and documents (Register)			Y		Contractor	
TBC	TBC	Residual Risk Table			Y		Contractor	
TBC	TBC	List of Design Changes (since AoD)			Y		Contractor	
TBC	TBC	Master Snagging List			Y		Contractor	
TBC	TBC	Operation & Maintenance Manual			Y		Contractor	
TBC	TBC	Health and Safety File			Y		Contractor	
TBC	TBC	Construction Compliance Certificate			Y		Contractor	
TBC	TBC	Check Certificates			Y		Contractor	
TBC	TBC	SCADA System Check List:			Y		Contractor	
TBC	TBC	Red-lined drawings and documents			Y		Contractor	
TBC	TBC	Confirmation of completed training and licensing			Y		Contractor	
TBC	TBC	Confirmation of completed procedure updates			Y		Contractor	
TBC	TBC	Stakeholder consultation comments sheets			Y		Contractor	
Closure of Change		Planned CAP Date for CoC:						
TBC	TBC	Final as-built drawings and documents				Y	Contractor	
TBC	TBC	Certificate of Final Completion				Y	Contractor	
TBC	TBC	Closed out Snagging List				Y	Contractor	
TBC	TBC	Fault Free Running Log				Y	Contractor	
TBC	TBC	Post Implementation Review				Y	Contractor	
TBC	TBC	Final O&M Manual				Y	Contractor	
TBC	TBC	Final H&S File				Y	Contractor	

MASTER DOCUMENT LIST

Change Name:	Custom House Escalators
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Change Number:	2019-109-00
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Version / Revision History	Date	Comments
Version 1.0	20.07.20	1st Issue

Notes: 1. This template list should not be considered exhaustive; additional assurance evidence may be required for the change. 2. Once completed, submit with the Technical Assurance Plan/Statement, for review at the first assurance gate following NoC. 3. This MDL should be updated before each gate. 4. The document reference and issue should be added when known. 5. If there is no AiP gate, the AiP documents marked as to be updated for AoD are to be submitted before the AoD gate. 6. If there is not AFT gate, the Inspection and Test Plan shall be provided at the AoD gate. 7. Key:
Y = Document should be produced for the gate U = High likelihood of updates / revisions being required at subsequent gates.

Document Acceptance	Name	Signature	Date
Custodian: Delivery Manager	Terri Muldoon		
Reviewed by: Designated Competent Person	Ioannis Karakitsos		
Accepted by: Change Assurance Manager	Nicky Ball		

Instructions:
1) Add rows and populate the list with change specific assurance documents that are in addition to the generic assurance documents listed.
2) Delete rows for generic assurance documents that are not applicable to the change.
3) Complete the 'Assurance Gate' columns, using the default content as a guide, and add any relevant comments.
4) Based on the programme for the change, propose dates for each assurance gate.
5) State who is responsible for production of each assurance document.

Document Ref.	Document Issue	Assurance Documentation Title	Assurance Gate					Responsibility for Document Production	Comments
			AiP	AoD	AFT	AoA	CoC		
Acceptance of Design			Planned CAP Date for AoD:						
19109-DLR-STR1-T255_Z-AS-K-0001	01	Technical Assurance Plan		Y			U		DLRL
19109-DLR-STR1-T255_Z-AS-K-0002	01	Master Document List		Y			U	U	DLRL
TBC	TBC	Handover / Handback Plan		Y			U		DLRL/KAD
TBC	TBC	Detailed Design Specification / detailed design		Y			U		Contractor
TBC	TBC	Design Risk Assessment		Y			U		Contractor
TBC	TBC	Human Factors Assessment		Y			U		Contractor
TBC	TBC	Design Check Certificate		Y			U		Contractor
TBC	TBC	EMC Compliance (signage only)		Y			U		Contractor
TBC	TBC	Stakeholder consultation comments sheets		Y			U		Contractor/DLRL
TBC	TBC	Inspection and Test Plan		Y					Contractor
Acceptance of Asset			Planned CAP Date for AoA:						
TBC	TBC	Asset List (New, altered or decommissioned)					Y		Contractor
TBC	TBC	Full list of drawings and documents					Y		Contractor
TBC	TBC	Residual Risk Table					Y		Contractor
TBC	TBC	List of Design Changes (since AoD)					Y		Contractor

MASTER DOCUMENT LIST

Document Ref.	Document Issue	Assurance Documentation Title	Assurance Gate					Responsibility for Document Production	Comments	
			AiP	AoD	AfT	AoA	CoC			
TBC	TBC	Master Snagging List				Y		Contractor		
TBC	TBC	Inspection & Test Reports (FAT & SAT)				Y		Contractor		
TBC	TBC	Installation Certificates				Y		Contractor		
TBC	TBC	Operation & Maintenance Manual				Y		Contractor		
TBC	TBC	Health and Safety File				Y		Contractor		
TBC	TBC	Construction Compliance Certificate				Y		Contractor		
TBC	TBC	Handback Checklist and Certificate				Y		Contractor/DLRL		
TBC	TBC	Red-lined drawings and documents				Y		Contractor		
TBC	TBC	Stakeholder consultation comments sheets				Y		Contractor/DLRL		
TBC	TBC	Acceptance of all snags and Non-Conformances				Y		DLRL		
Closure of Change			Planned CAP Date for CoC:							
TBC	TBC	Final as-built drawings and documents					Y	Contractor		
TBC	TBC	Certificate of Final Completion					Y	DLRL		
TBC	TBC	Closed out Snagging List					Y	DLRL		
TBC	TBC	Post Implementation Review					Y	DLRL		



Annexure 3

Technical Specification Requirements



Change / Project Title: Custom House Escalator Repair Works

Change / Project No.: 2019-109-00

Document Ref No.: 19109-DLR-LAE-T255_Z-SP-LE-0001

Technical Requirements Specification (TRS)

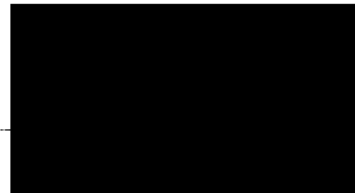
Signature

Date

Prepared by

Kristan J. Taberner

Asset Engineer



25-Aug-2020

Reviewed by

I confirm that the works detailed in this specification are consistent with the agreed scope and have been comprehensively specified, such that they can be delivered and integrated into the railway, without adversely impacting safe and reliable operations

Neil Ward

Project Engineer

Reviewed by

I confirm that if the works detailed in this specification are delivered in accordance with the requirements, the reliability, availability, maintainability and safety of the DLR will not be adversely impacted.

Mark Harbige

M&E Systems Manager |
KAD

Reviewed by

I confirm that this specification is consistent with the NEC3 contract and procurement strategy.

Tim Vardy

Project Manager

Approved by

I confirm that the works detailed in this specification meet the Sponsor's requirements and that all additional requirements are acceptable.

James Chapman

Sponsor's Representative



Distributed to Kevin McNally Sponsor
 Jennifer Banham Commercial Manager
 Manjit Benning Programme Manager

Document History

Revision	Date	Summary of changes
00	06-May-2020	First draft
01	14-Aug-2020	Updates to Signatories, Section 1.3, Tables 1 & 4 and Appendix A. Appendix B removed.

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1 Introduction

1.1 Document Purpose

The purpose of this document is to set the requirements for the Custom House (CUH) escalator assets post-storage overhaul works and ultimately determine the limits of the project works.

1.2 Objectives & Benefits

The strategic objective of the CUH escalator assets post-storage overhaul works is to bring the assets back up to a recognised standard prior to them being returned to customer use and to ensure the ongoing reliability & availability of the DLR escalators for use by our customers.

Specific objectives being targeted are:

- a) Replace life expired; broken; damaged; perished and/or worn components.
- b) Reduce energy consumption by incorporating improved / new technology, where possible (e.g. automatic start/stop etc.).
- c) Address any non-compliance with DLR and British Standards.
- a) Improve customer perception.
- b) Uphold or (ideally) reduce remaining whole life costs by improving RAMS and MTBF.
- c) Reduction in the cost of spares inventory by standardisation, where possible, on the products of a smaller number of manufacturers / suppliers.

1.3 Scope

The post-storage overhaul of 2No. KONE E3H 30° escalators assets at CUH DLR station.

The escalators were installed new in 2011 and, following an extended period of in-situ storage without maintenance, require an overhaul. This project will overhaul the escalators and, at the same time, rejuvenate the associated finishes to improve ambience.

The contractor will be required to develop an overhaul proposal based on the following Employer requirements, to improve escalator reliability and extend operational service life for a minimum of 10 years.

All works associated with the escalators assets post-storage overhauls are covered by this Technical Requirements Document. This includes:

a) Controller & safety switches:

- i. Full rewire retaining existing control panel.
(Option 1)

- ii. Not Used
- iii. Replace the existing safety switches & sensors with new, to OEM standard / specification, inc. all associated wiring.
- iv. Install & integrate any new safety switches & sensors required to bring the assets inline with the current BS EN 115 standard.

b) Handrail:

- i. Replace the existing handrails with new, to OEM standard / specification. They are to be black endless handrails incorporating visible white markers at 600mm centres.
- ii. Replace the existing handrail drive chain with new, to OEM standard / specification.
- iii. Replace the existing newel end rollers with new, to OEM standard / specification.

c) Step band:

- i. Replace the existing steps & step chains with new, to OEM standard / specification. The steps shall be in silver finish with yellow paint along the leading / trailing edge to assist the visually impaired.
- ii. Replace the existing brush guard with a new, heavy duty, double brush guard throughout.
- iii. Remove all existing under step lighting and install & integrate new LED under step lighting.

d) Drive:

- i. Replace the existing main drive chain with new, to OEM standard / specification.
- ii. Undertake a full service of the gearbox, lubricate where necessary & replace all bearings & seals and oil, to OEM standard / specification.
- iii. Undertake a full strip down service & clean of the motor with new bearings fitted throughout, to OEM standard / specification. Winding & insulation condition to be advised to the Project team immediately upon professional inspection.

e) Brake system:

- i. Undertake a full service of the brake system, lubricate where necessary & replace the solenoids, to OEM standard / specification.

f) Tracks:

- i. Replace the existing curve tracks (top & bottom) with new, to OEM standard / specification.

g) Balustrade & decking:

- i. Refurbish & polish all balustrade & decking panels in order to bring their appearance close to 'as new' condition. Panel & holding fixing condition to be advised to the Project team immediately upon professional inspection.

h) Passenger side:

- i. Replace the existing comb plates (top & bottom) with new comb plates (red colour), to OEM standard / specification.
- ii. Replace the existing tensator barriers with new, to DLRL standard.

i) Cleaning & lubrication:

- i. Undertake a full intrusive clean & degrease of the entire escalator assets (all components inc. truss, top & bottom pits and tunnel inclines) to remove all detritus.
- ii. Upon completion of the overhaul, all parts so requiring it shall be lubricated with the correct grade of grease or oil in accordance with manufacturers' instructions.

j) General:

- i. Use professional judgement during the strip down to assess the condition of all asset components including those not specifically covered in the TRS and provide the Employer with recommendations & cost estimates, should it be judged that replacement or refurbishment is required.
- ii. Correctly adjust lubricate (with the correct grade of grease or oil), refit, tension, set-up and align any remaining components, as necessary & in accordance with manufacturers' instructions, to ensure full compliance of the asset for testing & commissioning back in to service.
- iii. Production of method statements & risk assessments necessary to perform the works which shall be submitted to the Employer, a minimum of 5 weeks in advance of the associated works planned commencement, for Employer approval.

- iv. The re-use of existing or provision & installation of new CMS routes dependant on condition (inc. containment).
- v. The re-use of existing and/ or provision for new cabling depending on condition. Any existing cabling proposed to be re-used must be tested to ensure it is fit for purpose.
- vi. Removal of existing temporary barriers or hoardings required to segregate the works from the general working of the station.
- vii. New equipment is to be located in an accessible location, should an exact positional exchange not be possible.
- viii. Any new system or component needs to be capable of interfacing seamlessly with the existing escalator installation, as per the existing system.
- ix. Provision of any plant, tools & equipment to facilitate all works requirements.
- x. Fire stopping of any / all penetrations associated with the escalator post-storage overhaul works between different compartmentation areas, irrespective of whether the penetrations are pre-existing or created as a result of these works.
- xi. Provision for minor civils works associated with the works.
- xii. Replacement of any building materials and other services damaged or disturbed by the works, including 'making-good' for each installation.
- xiii. Testing and commissioning in accordance with the latest standards (individual components & all systems).
- xiv. Provision of training / familiarisation for KAD operations and maintenance staff.
- xv. Produce / supply Operation & Maintenance Manuals (O&M's) and as-built drawings.
- xvi. Provide updated asset registers / forms, covering assets removed & assets installed.
- xvii. Supply of spare parts as required to enable / support on-going operation and maintenance of the assets. The exact spare parts are to be discussed with DLRL and the maintainer (KAD).
- xviii. Removal of any assets made redundant by the works &/ identified as not required and offer up to the maintainer (KAD) as spares.
- xix. Disposal of existing assets &/ materials ensuring compliance with all legislative requirements.

In addition to the above, the scope is also to include the following;

- Provision of warranties (12 month minimum) for all new or refurbished components.
- Ensure the escalator assets are free of defects; breaches of legislation & safety risks.
- Ensure that the escalator assets interface seamlessly with existing integrated systems (e.g. SCADA; fire alarms etc.)

There are two escalators which constitute ‘the works’. They are as follows:

Table 1 | Escalators

Station	Quantity	Escalator No(s).	Escalator Type	Rise
Custom House (CUH)	2	1 & 2	Kone E3H	5.5m
TOTAL: 1 Stations	2 Escalators	-	-	

1.4 Project Context

The physical boundaries of each escalator post-storage overhaul works are detailed in *Figure 1*.

The asset owner and Employer is DLRL however, the assets are (will be) maintained by the DLR franchisee, Keolis Amey Docklands (KAD).

The system and project contexts are indicated by *Figures 1* and *2*.

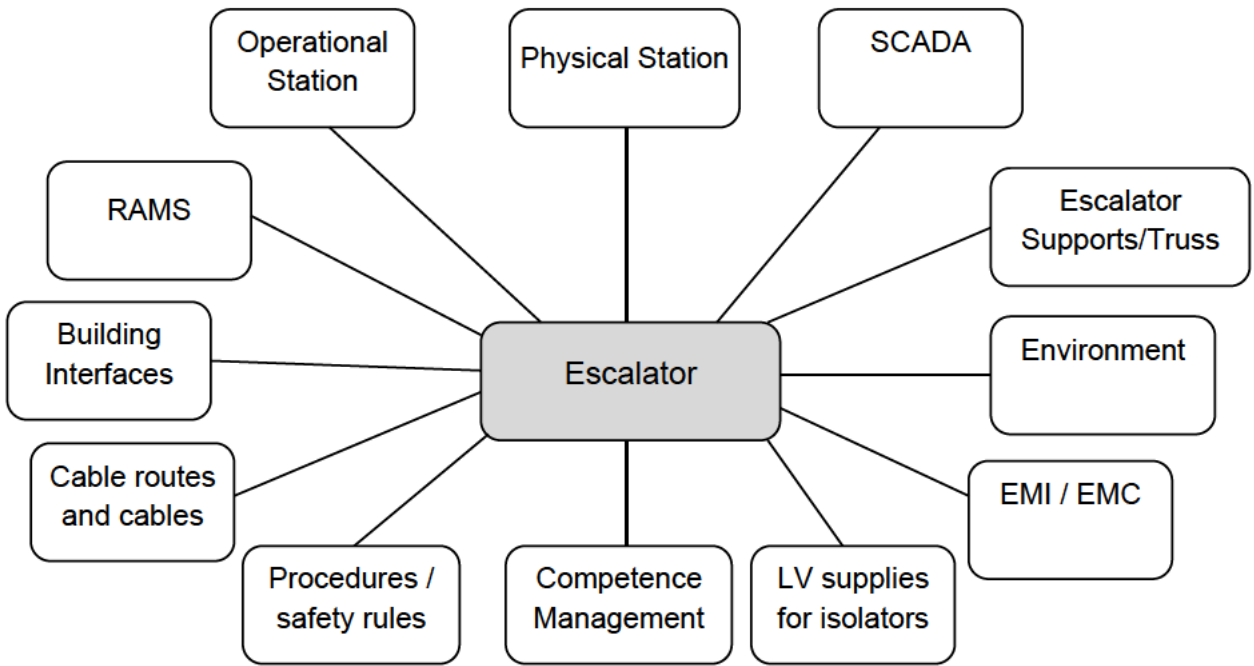


Figure 1 | System Context

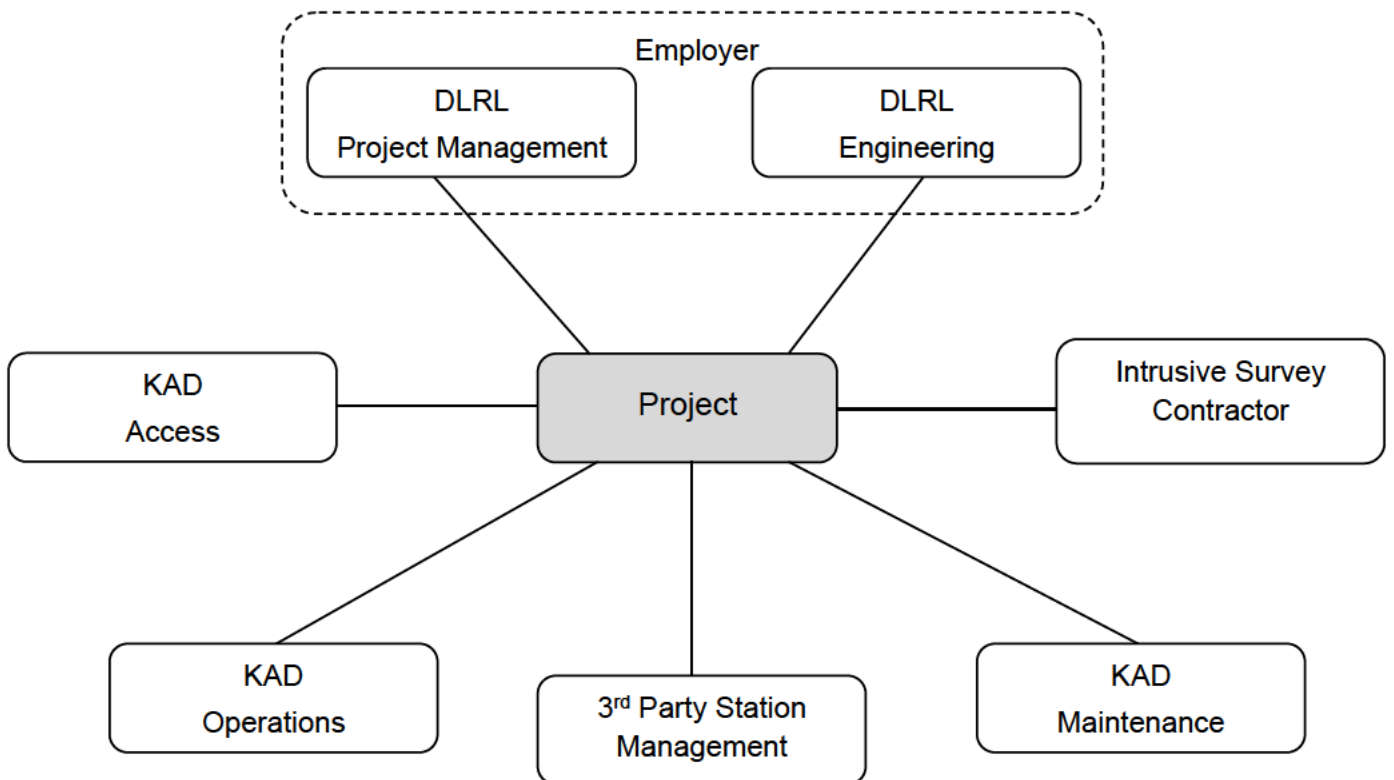


Figure 2 | Project Context

1.5 Context of the information in this document

This specification covers the requirements to deliver escalator assets post-storage overhauls on two escalators at CUH DLR station (see 'Table 1 | Escalators' for station details) and subsequent handback to the Employers maintainer.

1.6 References

The following are referenced in this document:

Table 2 | References

Ref.	Document ID	Title
[1]	-	DLR Working on the Railway Manual (WoRM)
[2]	DLR-JMS-PROC-022	Management of Asbestos on the DLR
[3]	DLR-ENG-STD-ES102	EMC Standard
[4]	DLR-ENG-STD-ES104	BIM Standard
[5]	DLR-ENG-STD-ES602	Building Other Systems Engineering Standard
[6]	DLR-JMS-PROC-003	Change Assurance Framework
[7]	DLR-JMS-PROC-009	Management of DLR Engineering & Maintenance Standards
[8]	DLR-JMS-PROC-014	Assurance of Non-Signaling Asset Changes
[9]	DLR-JMS-PROC-018	Assuring the Operability of New or Altered DLR Assets
[10]	DLR-JMS-PROC-019	Fire safety arrangements on the DLR
[11]	DLR-JMS-PROC-024	Possessions During Operational Hours
[12]	BS EN 115	Safety of escalators and moving walks
[13]	SPC-LAE-378260742	Specification for Docklands Light Railway Escalator Renewals*
[14]	SOP PC 3.12	Asset Handover & Handback
[15]	19109-DLR-STR1-T255_Z-AS-K-0001	Technical Assurance Plan
[16]	DLR-ENG-GDN-ES008	Asset Capture Sheet

* Compliance required where parts will be replaced / refurbished only.

2 Approach / Method

2.1 Requirements Management Process and Requirements Management Plan

N/A

2.2 Presented information

Stakeholders who have provided input into the process of defining the requirements in this document &/ who are associated with the works are recorded in [Appendix A](#).

2.3 Operating Environment

The works are to be undertaken in an operational environment:

- Main line station – except engineering hours
- Moving trains in close proximity
- Members of the public in close proximity

2.4 Third Party Consents

DLRL shall be responsible for the following 3rd Party acceptances and consents:

- KAD
- Dyer & Butler

The Contractor shall be responsible for all other 3rd Party acceptances and consents required for the works.

3 Requirements

3.1 Safety Requirements

Table 3 | Safety Requirements

Req. ID	Requirement Text	Source
SR_001	The new equipment shall include all the features necessary for safe operation and maintenance.	General
SR_002	The failure modes of equipment shall not present a hazard to maintenance staff and others.	General
SR_003	All equipment shall be maintainable, without unnecessary risk to health and safety.	General
SR_004	All new cables shall be low smoke, zero halogen.	General
SR_005	Where applicable, the designer shall demonstrate a sound hazard identification and risk mitigation process: A Designer's risk assessment shall be provided and shall be subject to acceptance by DLRL.	General
SR_006	For safety critical items, FMEA covering the systems and individual items of equipment shall be provided.	General
SR_007	Contractor to be compliant with relevant British Standards & Euro Norms.	General
SR_008	Contractor to be compliant with applicable DLR Standards.	General
SR_009	Contractor to be compliant with DLR Working on the Railway Manual (WoRM).	General
SR_0010	Evacuation routes shall not be impeded.	General
SR_0011	Production of method statements & risk assessments necessary to perform the works which shall be submitted to the Employer for approval.	General

3.2 Performance Requirements

Table 4 | Performance Requirements

Req. ID	Requirement Text	Source
PR_001	Overhauled escalators , fully compliant to current BS EN & DLR standards and DLR requirements, shall be designed (where applicable) & will integrate seamlessly in to the existing environment & systems.	General
PR_002	All components (as detailed in this document) for all escalators listed in Section 1 shall be replaced with modern equivalent, compliant with latest BS EN & DLR standards.	General
PR_003	All escalators shall have all surface finishes polished / refurbished / renovated – depending on current condition.	General
PR_004	Improvement of IP rating and other measures to a level appropriate to guarantee asset performance in the environment at the installed location, for new & replacement parts only.	General
PR_005	The appointed Contractor shall submit a clear plan and programme detailing the full scope of works and showing the exact locations of proposed works on site.	General
PR_006	Undertake any necessary surveys to mitigate risks (i.e. to delivery; installation; scope gaps; programme etc.)	General
PR_007	The re-use of existing or installation of new CMS routes, dependant on condition & suitability of existing.	General
PR_008	Provision for new cabling.	General
PR_009	Works to interface new assets & systems with existing assets & systems that are retained or new ancillary systems (e.g. control, SCADA, power supply) shall be provided.	General
PR_0010	Fire stopping of any / all penetrations associated with the escalator overhaul or escalator replacements between different compartmentation areas, irrespective of whether the penetrations are pre-existing or created as a result of these works.	General
PR_0011	Testing and commissioning in accordance with DLR requirements (i.e. BS EN 115-1 and SPC-LAE-378260742).	General
PR_0012	Provision of training / familiarisation for KAD depot operations and maintenance staff.	General
PR_0013	Replacement of any building materials and other services damaged or disturbed by the works, including	General

	'making-good'.	
PR_0014	Removal of any assets made redundant by the works &/ identified as not required and offer up to the maintainer (KAD) as spares.	General
PR_0015	Where applicable, the supplier shall produce all documentation necessary to enable the AiP to be achieved.	General
PR_0016	Where applicable, the supplier shall produce all documentation necessary to enable the AoD to be achieved.	General
PR_0017	Disposal of existing assets &/ materials ensuring compliance with all legislative requirements.	General
PR_0018	All works shall comply with DLR requirements, DLR Engineering standards, IEE wiring regulations and relevant British Standards / Euro Norms.	General
PR_0019	The works shall not adversely affect the normal operation of the station or the railway, unless wholly unavoidable.	General
PR_0020	If applicable, designs must have sufficient detailing to enable the works, ensuring, where applicable, any structural / architectural / civils works required to complete the works are included in the design.	General
PR_0021	The Designer shall, where applicable, ensure all required plans and drawings are up to date as part of AoD submission.	General
PR_0022	Drawings (if any) shall be made available in A3 format; Portable data file (PDF) and Microstation. - Structure, format and content must meet the requirements of the DLR BIM system.	General
PR_0023	All value engineering excersises are welcomed from suppliers / Contractors.	General
PR_0024	Where applicable, the Contractor shall produce or supply all documentation necessary to enable the AoA to be achieved - including, but not limited to, Operation & Maintenance Manuals (O&M's), H&S File (e.g. data sheets for all new components, residual risks etc.) and as-built drawings.	General
PR_0025	Provide updated asset registers / forms, covering assets removed & assets installed.	General
PR_0026	Supply a list of recommended spare (new) parts to enable on-going operation and maintenance of the new system.	General
PR_0027	The Contractor shall ensure that the existing electrical supply is suitable for use with the new equipment.	General

	If not, the supplier shall undertake design & cable calculations and remedy to ensure the electrical supply is fit for purpose & compliant to the latest standards.	
PR_0028	The refurbished escalators shall be capable of fully reversible (i.e. up or down travel) operation at the same service speeds upon completion of the works. This facility shall function either as regular or occasional use as required by DLR operations.	General

3.3 Operation & Maintenance Requirements

Table 5 | Operation & Maintenance Requirements

Req. ID	Requirement Text	Source
OR_001	Equipment labelling shall be sufficient to support all operations and maintenance activities under normal and degraded conditions and in line with DLR standards.	General
OR_002	Special tools and equipment for operation, maintenance and fault finding shall be provided, where required.	General
OR_003	Maintainer training shall be provided for all equipment that is different from that already in use on the operational railway.	General
OR_004	The equipment should be configured and built to allow any component to be safely replaced without the need to shut down or disrupt the system as a whole, unless unavoidable.	General

3.4 EMC Requirements

New products / components must comply with the latest EMC legislation / standards and not detrimentally impact on any existing assets.

Table 6 | EMC Requirements

Req. ID	Requirement Text	Source
EMC_001	Where required, the designer shall demonstrate understanding and compliance with EMC requirements at the AoD stage.	General
EMC_002	All parts of the system shall comply with DLR-ENG-STD-ES102.	General

3.5 Assumptions, Dependencies and Constraints

Table 7 | ADCs

ADC ID	ADC Text	Source	A,D or C	Related Req.ID
A_001	Where possible, it is assumed that the appointed Contractor will undertake pre & post work tests to demonstrate certain Performance Requirements have been satisfied.	General	A	PR_001
A_002	It is assumed that procedure SOP PC 3.12 will be followed.	General	A	PR_0018

Note: During or before the detailed design stage, all assumptions that relate to or may influence the design, manufacture, installation / construction or commissioning shall be validated by the Contractor. If the assumptions are found to be incorrect, the Contractor shall confirm the findings and recommend appropriate action to DLRL in writing. Recommendations shall not be implemented until agreed in writing by DLRL.

3.6 Design Requirements

Where required, the contractor shall make allowance for production of BIM compliant design drawings which detail all relevant assets, CMS and cable runs.

The contractor shall complete all the required DLRL assurance documentation at each stage of works and ensure that, prior to completion, a full set of operation and maintenance manuals are completed & supplied to enable safe use of the system.

The design shall consider other assets that interface with the proposed works. Drawings shall be made available in A3 format; Portable data file (PDF) and Microstation V8. Structure, format and content must meet the requirements of the DLR BIM system.

3.7 DLR Duty Holder Safety Management Systems

All works and equipment shall comply with the information listed in Table 3 | References.

3.8 Legislation, British, DLR and Industry Standards

The works shall be delivered in accordance with the requirements of the DLR Engineering Standards, all relevant British, European and International standards. Where the issue of each relevant DLR Engineering Standard is not specified, the issue that is current on the issue date for this specification shall be applied.

Non-compliance to British, European or International standard shall be notified to the Employer.

Where any conflicts arise between the requirements of this document and DLR or other published standards, compliance with this document shall take precedence, except where a breach of law or unacceptable safety risk would arise.

Where no relevant DLR, British, European, International or Industry Standards exist, the contractor shall propose to the Employer, the standards to be applied to the product at the tender stage.

All appropriate Standards (i.e. BS EN 115-1, DLR-ENG-STD-ES602, etc.) shall be reviewed by the Contractor and considered within the proposed design; the appointed Contractor's design shall declare all legislative documents and standards used within design and any departures are to be accordingly submitted to the Employer.

4 External Interface Requirements

4.1 User Interfaces

New products must interface with the existing structure & services and allow sufficient access to allow maintenance activities to be undertaken, as required.

4.2 Hardware Interfaces

New products must interface with the existing escalator installation &/ services.

4.3 Software Interfaces

New products must interface with the existing services.

4.4 Communications Interfaces

New products must interface with the existing communications installation.

5 Abbreviations

The following abbreviations are used in this document:

Table 8 | Abbreviations

Abbreviations	Definition
BCP	Business Critical Process
BS	British Standard
CMS	Cable Management System
DLR / DLRL	Docklands Light Railway / Ltd.
EMC / I	Electro Magnetic Compatibility / Interference
EN	European Norm
H&S	Health & Safety
KAD	Keolis Amey Docklands
MTBF	Mean Time Between Failure
O&M	Operation & Maintenance
RAMS	Reliability, Availability, Maintainability, Safety
TfL	Transport for London
TRS	Technical Requirements Specification
WoRM	Working on the Railway Manual

Appendix A | Stakeholders

This is a list of all the Stakeholders associated with the works.

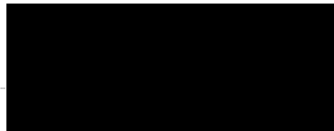
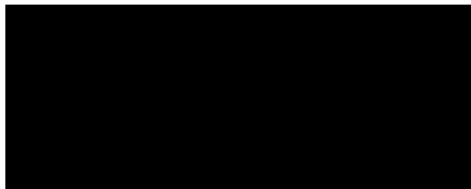


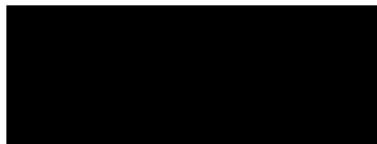
Table 9 | Stakeholders

Station	Directorate / Organisation / Job Title	Key Interest
James Chapman	DLRL Engineering	Sponsor's Representative
Mark Harbige	KAD Engineering	Operation and Maintenance
Tim Vardy	DLRL Projects	Project Management
Neil Ward	DLRL Engineering	Project Engineer
Stacey Reeves	DLRL Engineering	L&E Engineer
Kristan Taberner	DLRL Engineering	Asset Engineering



Change / Project Title: Escalator Assets Mid-Life Overhaul
Change / Project No.: 2019-109-02
Document Ref No.: 19109-DLR-LAE-T735_Z-SP-LE-0001

Technical Requirements Specification (TRS)

		Signature	Date
Prepared by	Kristan J. Taberner Asset Engineer		07-Dec-2020
Reviewed by	I confirm that the works detailed in this specification are consistent with the agreed scope and have been comprehensively specified, such that they can be delivered and integrated into the railway, without adversely impacting safe and reliable operations Stacey Reeves L&E Engineer		
Reviewed by	I confirm that if the works detailed in this specification are delivered in accordance with the requirements, the reliability, availability, maintainability and safety of the DLR will not be adversely impacted. Mark Harbige M&E Systems Manager KAD		7/12/20
Reviewed by	I confirm that this specification is consistent with the NEC3 contract and procurement strategy. Tim Vardy Project Manager		09/12/2020
Approved by	I confirm that the works detailed in this specification meet the Sponsor's requirements and that all additional requirements are acceptable. James Chapman Sponsor's Representative		09.12.2020



Distributed to Kevin McNally Sponsor
Jennifer Banham Commercial Manager
Manjit Benning Programme Manager

Document History

Revision	Date	Summary of changes
00	30-Nov-2020	First draft

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1 Introduction

1.1 Document Purpose

The purpose of this document is to set the requirements for the escalator assets mid-life overhaul works at London City Airport (LCA) and ultimately determine the limits of the project works.

1.2 Objectives & Benefits

The strategic objective of the escalator assets mid-life overhaul works is to bring the assets back up to a recognised standard and to ensure the ongoing reliability & availability of the DLR escalators for use by our customers.

Specific objectives being targeted are:

- a) Replace life expired; broken; damaged; perished and/or worn components.
- b) Reduce energy consumption by incorporating improved / new technology, where possible (e.g. automatic start/stop, inverter drives etc.).
- c) Address any non-compliance with DLR and British Standards.
- d) Improve customer perception.
- e) Arrest any decline in DLR escalator availability.
- f) Uphold or (ideally) reduce remaining whole life costs by improving RAMS and MTBF.
- g) Reduction in the cost of spares inventory by standardisation, where possible, on the products of a smaller number of manufacturers / suppliers.

1.3 Scope

The mid-life overhaul of two escalator assets at London City Airport.

The escalators were installed new in 2006 and now require a mid-life overhaul. This project will overhaul the escalators and, at the same time, rejuvenate the associated finishes to improve ambience.

The *Contractor* will be required to develop an overhaul design based on the following *Employer* requirements, to improve escalator reliability and extend operational service life for a minimum of 10 years.

Note: Works priority sequencing to be advised by DLRL following contract award.

All works associated with the escalator assets mid-life overhauls are covered by this Technical Requirements Document. This includes:

a) Controller & safety switches:

- i. Replace the existing control panel with a new open protocol type including VVVF inverter drive option (for energy saving), compliant to the latest BS EN 115 standard.
- ii. The control system is also to be designed to provide auto stop/start functionality.
- iii. Replace the existing safety switches & sensors with new, to OEM standard / specification, inc. all associated wiring.
- iv. Install & integrate any new safety switches & sensors required to bring the assets inline with the current BS EN 115 standard, including those required for the auto stop/start functionality.

b) Handrail:

- i. Replace the existing handrails with new, to OEM standard / specification. They are to be black endless handrails incorporating visible white markers at 600mm centres.
- ii. Replace the existing handrail drive chain with new, to OEM standard / specification.
- iii. Replace the existing newel end rollers with new, to OEM standard / specification.

c) Step band:

- i. Replace the existing brush guard with a new, heavy duty, double brush guard throughout.
- ii. Remove all existing under step lighting and install & integrate new LED under step lighting.

d) Drive:

- i. Replace the existing main drive chain with new, to OEM standard / specification.
- ii. Undertake a full service of the gearbox, lubricate where necessary & replace all bearings & seals and oil, to OEM standard / specification.
- iii. Undertake a full strip down service & clean of the motor with new bearings fitted throughout, to OEM standard / specification. Winding & insulation to be renewed.

- iv. Drive shaft (inc. key way) condition to be advised to the Project team immediately upon professional inspection.

e) Brake system:

- i. Undertake a full service of the brake system, lubricate where necessary & replace the solenoids, to OEM standard / specification.

f) Tracks:

- i. Replace the existing curve tracks (top & bottom) with new, to OEM standard / specification.

g) Balustrade & decking:

- i. Refurbish & polish all balustrade & decking panels in order to bring their appearance close to 'as new' condition. Panel & holding fixing condition to be advised to the Project team immediately upon professional inspection.

h) Passenger side:

- i. Replace the existing comb plates (top & bottom) with new comb plates (red colour), to OEM standard / specification.
- ii. Replace the existing floor plates (top & bottom) with new, to OEM standard / specification.
- iii. Replace the existing tensator barriers with new, to DLRL standard.

i) Cleaning & lubrication:

- i. Undertake a full intrusive clean & degrease of the entire escalator assets (all components inc. truss, top & bottom pits and tunnel inclines) to remove all detritus.
- ii. Upon completion of the overhaul, all parts so requiring it shall be lubricated with the correct grade of grease or oil in accordance with manufacturers' instructions.

j) General:

- i. The *Contractor* notifies the *Project Manager* if the *Contractor* becomes aware of any asset components which in the professional judgement of the *Contractor* require replacement or refurbishment.
- ii. Correctly adjust, lubricate (with the correct grade of grease or oil), refit, tension, set-up and align any remaining components, as necessary & in accordance with manufacturers' instructions, to ensure full compliance of the asset for testing & commissioning back in to service.

- iii. Production of method statements & risk assessments necessary to perform the works which shall be submitted to the *Employer*, a minimum of 5 weeks in advance of the associated works planned commencement, for *Employer* approval.
- iv. The re-use of existing CMS routes, dependant on condition (inc. containment).
- v. The provision for new cabling. Any existing cabling proposed to be re-used must be tested to ensure it is fit for purpose.
- vi. Removal of any construction hoarding utilised to segregate the works from the general working of the station and delivered to a location of KAD's choice within a 25 mile radius of Poplar Depot (Castor Lane, Poplar, London. E14 0BL).
- vii. New equipment is to be located in an accessible location, should an exact positional exchange not be possible.
- viii. Any new system or component needs to be capable of interfacing seamlessly with the existing escalator, station & control centres installation, as per the existing system.
- ix. Provision of any plant, tools & equipment to facilitate all works requirements.
- x. Fire stopping of any / all penetrations associated with the escalator mid-life overhaul works between different compartmentation areas, irrespective of whether the penetrations are pre-existing or created as a result of these works.
- xi. Provision for minor civils works associated with the works.
- xii. Replacement of any building materials and other services damaged or disturbed by the works, including 'making-good' for each installation.
- xiii. Testing and commissioning in accordance with accepted ITPs (individual components & all systems).
- xiv. Provision of training / familiarisation for KAD operations and maintenance staff.
- xv. Produce / supply Operation & Maintenance Manuals (O&M's) and as-built drawings.
- xvi. Provide updated asset registers / forms, covering assets removed & assets installed.
- xvii. Supply of spare parts to enable / support on-going operation and maintenance of the assets. The exact spare parts are to be discussed with DLRL and the maintainer (KAD).
- xviii. Removal of any assets made redundant by the works &/ identified as not required and delivered to the maintainer (KAD) as spares (see xix below).

- xix. Provision of delivery for all assets, that are in a reuseable condition currently, or following refurbishment by KAD, and made redundant by the works. Component assets to be delivered to a location of KAD's choice within a 25 mile radius of Poplar Depot (Castor Lane, Poplar, London. E14 0BL).
- xx. Disposal of existing assets &/ materials, deemed life expired and which cannot be refurbished, ensuring compliance with all legislative requirements.

In addition to the above, the scope is also to include the following;

- Provision of warranties (12 month minimum) for all new or refurbished components.
- Ensure the escalator assets are free of defects; breaches of legislation & safety risks.
- Ensure that the escalator assets interface seamlessly with existing integrated systems (e.g. SCADA; fire alarms etc.)

There are 2 (two) escalators which constitute 'the works'. They are as follows:

Table 1 | Escalators

Station	Quantity	Escalator No(s).	Escalator Type	Rise
London City Airport (LCA)	2	1 & 2	Schindler	6.92m
TOTAL: 1 Stations	2 Escalators	-	-	

The following table references the survey report undertaken by a third party on behalf of DLRL which may be used for tendering purposes:

Table 2 | Third Party Survey Reports

Station	Report Doc. No.
London City Airport (LCA)	1309001-SRS-EAM15-T735_Z-RP-W-0005

See [Appendix B](#) for a copy of the third party survey report.

1.4 Project Context

The physical boundaries of each escalator mid-life overhaul works are detailed in *Figure 1*.

The asset owner and *Employer* is DLRL however, the assets are (will be) maintained by the DLR franchisee, Keolis Amey Docklands (KAD).

The system and project contexts are indicated by *Figures 1 and 2*.

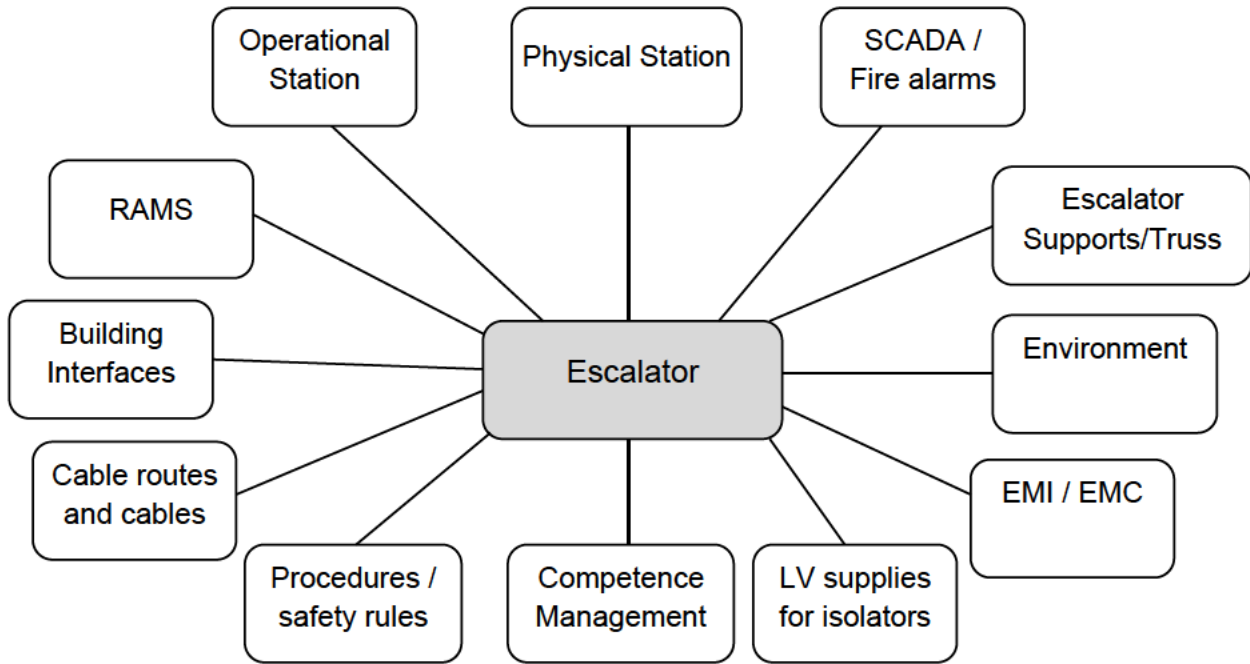


Figure 1 | System Context

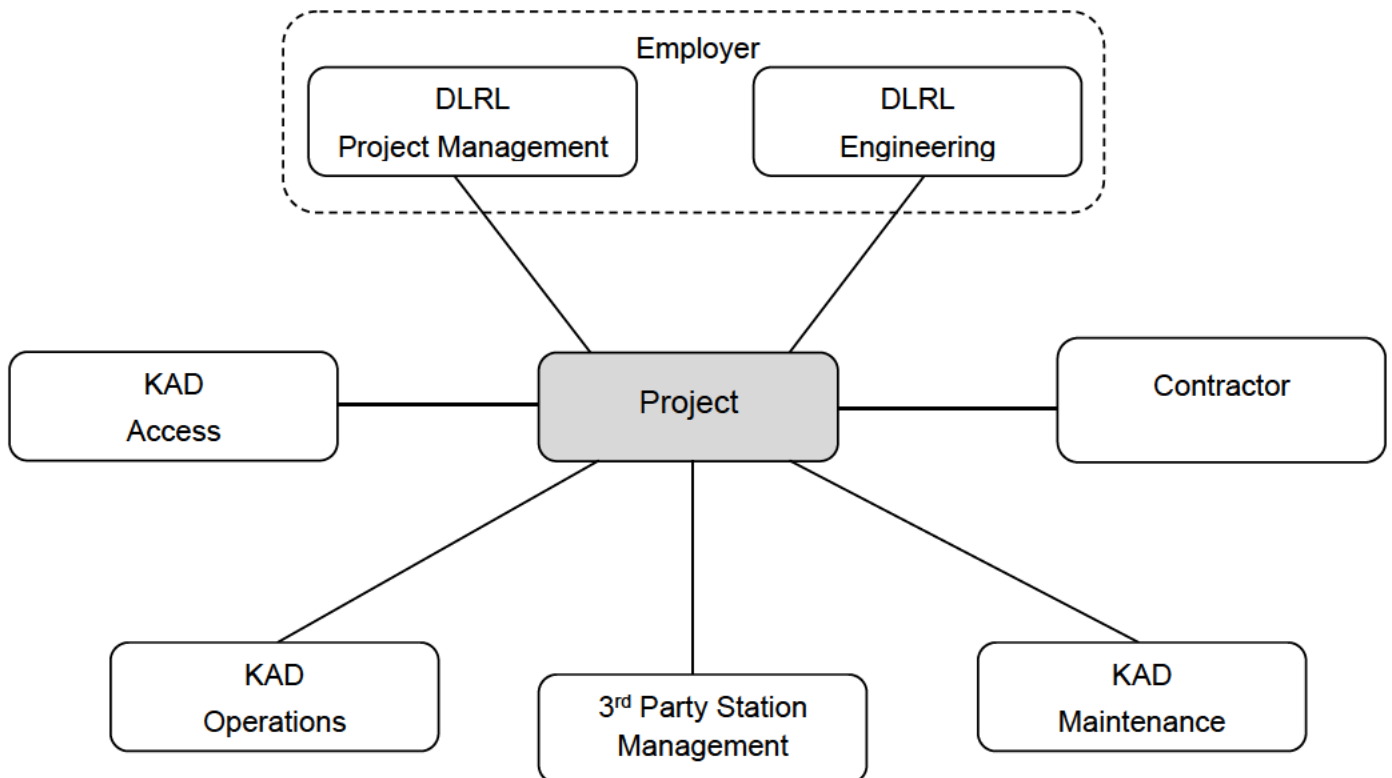


Figure 2 | Project Context

1.5 Context of the information in this document

This specification covers the requirements to deliver escalator assets mid-life overhauls on 18 (eighteen) escalators at multiple DLR station (see 'Table 1 | Escalators' for station details) and subsequent handback to the *Employers* maintainer.

1.6 References

The following are referenced in this document:

Table 3 | References

Ref.	Document ID	Title
[1]	DLR-ENG-L&E-RQE-0002	Project Requirements
[2]	-	DLR Working on the Railway Manual (WoRM)
[3]	DLR-JMS-PROC-022	Management of Asbestos on the DLR
[4]	DLR-ENG-STD-ES102	EMC Standard
[5]	DLR-ENG-STD-ES104	BIM Standard
[6]	DLR-ENG-STD-ES602	Building Other Systems Engineering Standard
[7]	DLR-JMS-PROC-003	Change Assurance Framework
[8]	DLR-JMS-PROC-009	Management of DLR Engineering & Maintenance Standards
[9]	DLR-JMS-PROC-014	Assurance of Non-Signaling Asset Changes
[10]	DLR-JMS-PROC-018	Assuring the Operability of New or Altered DLR Assets
[11]	DLR-JMS-PROC-019	Fire safety arrangements on the DLR
[12]	DLR-JMS-PROC-024	Possessions During Operational Hours
[13]	BS EN 115	Safety of escalators and moving walks
[14]	SPC-LAE-378260742	Specification for Docklands Light Railway Escalator Renewals*
[15]	SOP PC 3.12	Asset Handover & Handback
[16]	19109-DLR-EAM15-TR000_Z-AS—0001	Technical Assurance Plan
[17]	DLR-ENG-GDN-ES008	Asset Capture Sheet

* Compliance required where parts will be replaced / refurbished only.

2 Approach / Method

2.1 Requirements Management Process and Requirements Management Plan

N/A

2.2 Presented information

Stakeholders who have provided input into the process of defining the requirements in this document &/ who are associated with the works are recorded in [Appendix A](#).

2.3 Operating Environment

The works are to be undertaken in an operational environment:

- Main line station – except engineering hours
- Moving trains in close proximity
- Members of the public in close proximity
- International airport

2.4 Third Party Consents

DLRL shall be responsible for the following 3rd Party acceptances and consents:

- KAD
- London City Airport

The *Contractor* shall be responsible for all other 3rd Party acceptances and consents required for the works.

3 Requirements

3.1 Safety Requirements

Table 4 | Safety Requirements

Req. ID	Requirement Text	Source
SR_001	The new equipment shall include all the features necessary for safe operation and maintenance.	General
SR_002	The failure modes of equipment shall not present a hazard to maintenance staff and others.	General
SR_003	All equipment shall be maintainable, without unnecessary risk to health and safety.	General
SR_004	All new cables shall be low smoke, zero halogen.	General
SR_005	Where applicable, the designer shall demonstrate a sound hazard identification and risk mitigation process: A Designer's risk assessment shall be provided and shall be subject to acceptance by DLRL.	General
SR_006	For safety critical items, FMEA covering the systems and individual items of equipment shall be provided.	General
SR_007	<i>Contractor</i> to be compliant with relevant British Standards & Euro Norms.	General
SR_008	<i>Contractor</i> to be compliant with applicable DLR Standards.	General
SR_009	<i>Contractor</i> to be compliant with DLR Working on the Railway Manual (WoRM).	General
SR_0010	Evacuation routes shall not be impeded.	General
SR_0011	Production of method statements & risk assessments necessary to perform the works which shall be submitted to the <i>Employer</i> for approval.	General

3.2 Performance Requirements

Table 5 | Performance Requirements

Req. ID	Requirement Text	Source
PR_001	Overhauled escalators , fully compliant to current BS EN & DLR standards and DLR requirements, shall be designed (where applicable) & will integrate seamlessly in to the existing environment, systems, station & control centres.	General
PR_002	All components (as detailed in this document) for all escalators listed in Section 1 shall be replaced with modern equivalent, compliant with latest BS EN & DLR standards.	General
PR_003	All escalators shall have all surface finishes polished / refurbished / renovated – depending on current condition.	General
PR_004	Improvement of IP rating and other measures to a level appropriate to guarantee asset performance in the environment at the installed location, for new & replacement parts only.	General
PR_005	The appointed <i>Contractor</i> shall submit a clear plan and programme detailing the full scope of works and showing the exact locations of proposed works on site.	General
PR_006	Undertake any necessary surveys to mitigate risks (i.e. to delivery; installation; scope gaps; programme etc.)	General
PR_007	The re-use of existing or installation of new CMS routes, dependant on condition & suitability of existing.	General
PR_008	Provision for new cabling.	General
PR_009	Works to interface new assets & systems with existing assets & systems that are retained or new ancillary systems (e.g. control, SCADA, power supply) shall be provided.	General
PR_0010	Fire stopping of any / all penetrations associated with the escalator overhaul or escalator replacements between different compartmentation areas, irrespective of whether the penetrations are pre-existing or created as a result of these works.	General
PR_0011	Testing and commissioning in accordance with DLR requirements (i.e. BS EN 115-1 and SPC-LAE-378260742).	General
PR_0012	Provision of training / familiarisation for KAD depot operations and maintenance staff.	General

PR_0013	Replacement of any building materials and other services damaged or disturbed by the works, including 'making-good'.	General
PR_0014	Removal of any assets made redundant by the works &/ identified as not required and supplied to the maintainer (KAD) as spares.	General
PR_0015	Where applicable, the supplier shall produce all documentation necessary to enable the AiP to be achieved.	General
PR_0016	Where applicable, the supplier shall produce all documentation necessary to enable the AoD to be achieved.	General
PR_0017	Disposal of existing assets &/ materials ensuring compliance with all legislative requirements.	General
PR_0018	All works shall comply with DLR requirements, DLR Engineering standards, IEE wiring regulations and relevant British Standards / Euro Norms.	General
PR_0019	The works shall not adversely affect the normal operation of the station or the railway, unless wholly unavoidable.	General
PR_0020	If applicable, designs must have sufficient detailing to enable the works, ensuring, where applicable, any structural / architectural / civils works required to complete the works are included in the design.	General
PR_0021	The Designer shall, where applicable, ensure all required plans and drawings are up to date as part of AoD submission.	General
PR_0022	Drawings (if any) shall be made available in A3 format; Portable data file (PDF) and Microstation. - Structure, format and content must meet the requirements of the DLR BIM system.	General
PR_0023	All value engineering excersises are welcomed from suppliers / <i>Contractors</i> .	General
PR_0024	Where applicable, the <i>Contractor</i> shall produce or supply all documentation necessary to enable the AoA to be achieved - including, but not limited to, Operation & Maintenance Manuals (O&M's), H&S File (e.g. data sheets for all new components, residual risks etc.) and as-built drawings.	General
PR_0025	Provide updated asset registers / forms, covering assets removed & assets installed.	General
PR_0026	Supply a list of recommended spare (new) parts to enable on-going operation and maintenance of the new system.	General

PR_0027	The <i>Contractor</i> shall ensure that the existing electrical supply is suitable for use with the new equipment. If not, the supplier shall undertake design & cable calculations and remedy to ensure the electrical supply is fit for purpose & compliant to the latest standards.	General
PR_0028	The refurbished escalators shall be capable of fully reversible (i.e. up or down travel) operation at the same service speeds upon completion of the works. This facility shall function either as regular or occasional use as required by DLR operations.	General
PR_0029	Retain & store all existing steps & step chains in readiness for reuse (inc. safe transportation from & to site) in accordance with manufacturer recommendations.	General

3.3 Operation & Maintenance Requirements

Table 6 | Operation & Maintenance Requirements

Req. ID	Requirement Text	Source
OR_001	Equipment labelling shall be sufficient to support all operations and maintenance activities under normal and degraded conditions and in line with DLR standards.	General
OR_002	Special tools and equipment for operation, maintenance and fault finding shall be provided, where required.	General
OR_003	Maintainer training shall be provided for all equipment that is different from that already in use on the operational railway.	General
OR_004	The equipment should be configured and built to allow any component to be safely replaced without the need to shut down or disrupt the system as a whole, unless unavoidable.	General
OR_005	Maintain all existing steps & step chains, whilst in storage, in accordance with manufacturer recommendations.	General

3.4 EMC Requirements

New products / components must comply with the latest EMC legislation / standards and not detrimentally impact on any existing assets.

Table 7 | EMC Requirements

Req. ID	Requirement Text	Source
EMC_001	Where required, the designer shall demonstrate understanding and compliance with EMC requirements at the AoD stage.	General
EMC_002	All parts of the system shall comply with DLR-ENG-STD-ES102.	General

3.5 Assumptions, Dependencies and Constraints

Table 8 | ADCs

ADC ID	ADC Text	Source	A,D or C	Related Req.ID
A_001	Where possible, it is assumed that the appointed <i>Contractor</i> will undertake pre & post work tests to demonstrate certain Performance Requirements have been satisfied.	General	A	PR_001
A_002	It is assumed that procedure SOP PC 3.12 will be followed.	General	A	PR_0018

Note: During or before the detailed design stage, all assumptions that relate to or may influence the design, manufacture, installation / construction or commissioning shall be validated by the *Contractor*. If the assumptions are found to be incorrect, the *Contractor* shall confirm the findings and recommend appropriate action to DLRL in writing. Recommendations shall not be implemented until agreed in writing by DLRL.

3.6 Design Requirements

Where required, the *Contractor* shall make allowance for production of BIM compliant design drawings which detail all relevant assets, CMS and cable runs.

The *Contractor* shall complete all the required DLRL assurance documentation at each stage of works and ensure that, prior to completion, a full set of operation and maintenance manuals are completed & supplied to enable safe use of the system.

The design shall consider other assets that interface with the proposed works. Drawings shall be made available in A3 format; Portable data file (PDF) and Microstation V8. Structure, format and content must meet the requirements of the DLR BIM system.

3.7 DLR Duty Holder Safety Management Systems

All works and equipment shall comply with the information listed in Table 3 | References.

3.8 Legislation, British, DLR and Industry Standards

The works shall be delivered in accordance with the requirements of the DLR Engineering Standards, all relevant British, European and International standards. Where the issue of each relevant DLR Engineering Standard is not specified, the issue that is current on the issue date for this specification shall be applied.

Non-compliance to British, European or International standard shall be notified to the *Employer*.

Where any conflicts arise between the requirements of this document and DLR or other published standards, compliance with this document shall take precedence, except where a breach of law or unacceptable safety risk would arise.

Where no relevant DLR, British, European, International or Industry Standards exist, the *Contractor* shall propose to the *Employer*, the standards to be applied to the product at the tender stage.

All appropriate Standards (i.e. BS EN 115-1, DLR-ENG-STD-ES602, etc.) shall be reviewed by the *Contractor* and considered within the proposed design; the appointed *Contractor's* design shall declare all legislative documents and standards used within design and any departures are to be accordingly submitted to the *Employer*.

4 External Interface Requirements

4.1 User Interfaces

New products must interface with the existing structure & services and allow sufficient access to allow maintenance activities to be undertaken, as required.

4.2 Hardware Interfaces

New products must interface with the existing escalator installation &/ services.

4.3 Software Interfaces

New products must interface with the existing services.

4.4 Communications Interfaces

New products must interface with the existing communications installation.

5 Abbreviations

The following abbreviations are used in this document:

Table 9 | Abbreviations

Abbreviations	Definition
AiP	Acceptance in Principle
AoA	Acceptance of Asset
AoD	Acceptance of Design
BIM	Building Information Modelling
BS	British Standard
CMS	Cable Management System
DLR / DLRL	Docklands Light Railway / Ltd.
EMC / I	Electro Magnetic Compatibility / Interference
EN	European Norm
FMEA	Failure Modes and Effects Analysis
IEE	Institution of Electrical Engineers
H&S	Health & Safety
ITP	Inspection & Test Plan
KAD	Keolis Amey Docklands
MTBF	Mean Time Between Failure
O&M	Operation & Maintenance
PDF	Portable Document Format
RAMS	Reliability, Availability, Maintainability, Safety
SCADA	Supervisory Control and Data Acquisition
SOP	Standard Operating Procedure
TfL	Transport for London
TRS	Technical Requirements Specification
WoRM	Working on the Railway Manual

Appendix A | Stakeholders

This is a list of all the Stakeholders associated with the works.

Table 10 | Stakeholders


Station	Directorate / Organisation / Job Title	Key Interest
James Chapman	DLRL Engineering	Sponsor's Representative
Mark Harbige	KAD Engineering	Operation and Maintenance
Tim Vardy	DLRL Projects	Project Management
Stacey Reeves	DLRL Engineering	L&E Engineer
Kristan Taberner	DLRL Engineering	Asset Engineering

Appendix B | Third Party Survey Reports

❖ London City Airport (LCA): 1309001-SRS-EAM15-T735_Z-RP-W-0005



Appendix B -
1309001-SRS-EAM15

Issue / Revision Description: 01		Date: January 2018
Lead Author: P.Cooke / P. Stoneman	Reviewed: K. Seaborne	Approved:
Senior Engineer L&E / Design Engineering Manager L&E	Head of Technical Discipline L&E	Docklands representative
Document Status: Reviewed for Issue.		
		TfL L&E Engineering Victoria Station House 191 Victoria Street London SW1E 5NE

Title:
<h1 style="margin: 0;">Specification for Docklands Light Railway Escalator Replacements</h1>

Format	Document Number	Revision
A4	SPC-LAE-378260742	01

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1. Escalator Specification

1.1 *General Requirements*

- 1.1.1 This specification identifies the Employer's technical requirements for the design, manufacture and installation an escalator within Transport for London's portfolio.
- 1.1.2 The Employer has particular requirements for escalators, which are not adequately specified by laid-down industry standards. This document specifies technical requirements and highlights the areas where the needs of the Employer exceed National, European and International standards.

2. Scope

2.1 *General Requirements*

- 2.1.1 This specification defines the Employer's requirements for the design, manufacture, installation and commissioning, for escalators. It does not cover the individual requirements of each working site, or any contract-specific variances to this specification. These will be found in the site-specific documentation.
- 2.1.2 All clauses which refer to the site-specific documentation shall be highlighted in **blue**.
- 2.1.3 **Fire requirements will be highlighted in the site-specific documentation.**
- 2.1.4 **For any special outdoor requirements, please refer to the site-specific documentation.**

3. References

3.1 *General Requirements*

- 3.1.1 The text of this document cites other documents that provide information or guidance. These are listed in **Error! Reference source not found.**
- 3.1.2 For abbreviations that are used in this specification, these are listed in Appendix A below.
- 3.1.3 For definitions that are used in this specification, these are listed in Appendix B below.
- 3.1.4 References to British Standards shall be taken to include the words 'or equivalent ISO, DIN, AFNOR or other European Standards', subject to the agreement of the *Employer*.

4. Disclaimers

4.1 *General Requirements*

- 4.1.1 In issuing this document for its stated purpose, TfL makes no warranties, express or implied, that compliance with all or any documents it issues is sufficient on its own to ensure safe systems of work or operation. *Contractors* are reminded of their own duties under health and safety legislation.
- 4.1.2 The safe and reliable operation of escalators is of paramount importance to the running of the London rail network. No acceptance of any of the *Contractor's* drawings, plans or calculations by the *Employer* shall relieve the *Contractor* from full responsibility for their accuracy in every respect, nor from full compliance with the provision of the contract and specification, nor from product liability.
- 4.1.3 Within the total system design, there shall be no potential for single point failures to cause injury or death.

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5. National and International Standards and Legislation

5.1 *General Requirements*

5.1.1 The escalator shall conform to all current relevant standards and legislation, in particular:

- a) BS EN 115-1:2017: Safety of escalators and moving walks [1];
- b) BS 7801: Code of practice for safe working on escalators and moving walks [2] ;
- c) BS EN 13015: Maintenance for lifts and escalators - Rules for maintenance instructions [3];
- d) BS 8300: Design of buildings and their approaches to meet the needs of disabled people. Code of practice [4];
- e) The Building Regulations. Approved Document 'B' Fire Safety [5];
- f) BS 9999:2017; Fire safety in the design, management and use of buildings. Code of practice [6]
- g) The Building Regulations. Approved Document 'M' Access and Facilities for Disabled People Volume 2 Building other than dwellings [7].
- h) The Fire Precautions (Sub-surface Railway Stations) (England) Regulations [8];
- i) Supply of Machinery (Safely) Regulations [9];
- j) The EMC Regulations [10].
- k) The complete escalator installation shall carry 'CE' marking in a prominent location visible to members of the public [9].

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6. Design

6.1 **Design Submission**

- 6.1.1 All documentation shall be written in the English language. Where drawings and other data emanate from a non-UK source, an accurate translation shall be provided.
- 6.1.2 All documentation submitted electronically shall bear a file name which clearly indicates the unique document reference, and its revision status.
- 6.1.3 All documents shall carry evidence of being checked and approved in accordance with the *Contractor's* control system.

6.2 **Availability, Reliability and Maintainability**

- 6.2.1 The escalator selected shall be of a type which has been thoroughly tested and has a proven track record of performance within a similar environment.
- 6.2.2 The *Contractor* shall provide reliability, availability, maintainability and safety compliance covering the operation of the escalator.
- 6.2.3 The Contractor shall identify how the proposed system shall achieve the required availability target. This shall be by combination of maintainability and reliability (i.e. the system shall be designed for ease of maintenance, with comprehensive self-diagnosis and all major components readily accessible).

For electrical systems, 'plug out, plug-in' philosophy shall be adopted wherever practicable. Design for maintainability shall not be a substitute for high reliability. It is not acceptable to offset short MTBF by redundancy or very short MTTR, or both).

- 6.2.4 The reliability shall be expressed in terms of hours run between failures.

6.3 **Design Changes**

- 6.3.1 Design changes shall be supported by drawings, calculations and FMEA as appropriate. These shall be submitted to the *Employer* for review and formal acceptance.

6.4 **Failure Mode & Effect Analysis (FMEA)**

- 6.4.1 For any deviation from OEM standard design options, where the assembly or component is new and novel and has no or limited field history, the *Contractor* shall carry out an FMEA, in accordance with BS EN 60812:2006 [11], which shall include, but not be limited to:

- a) Steps;
- b) Main drive shaft;
- c) Tension carriage;
- d) Step chains;
- e) Drive machine and braking system;
- f) Drive and control system, including all safety devices.

- 6.4.2 The FMEA shall identify all possible failure modes and the consequences of each failure, including potential damage that could occur to other parts of the escalator. The *Contractor* shall consider how predictable failures can be prevented by design or detected before they constitute a hazard. This shall include failures which can arise, over a period of time, as a result of degraded condition.

The findings of the analysis shall be addressed by improved design or, where this is not practical, by identifying the actions to be taken to guarantee safe and reliable operation in the operation and maintenance manuals.

6.5 **Controller Software**

- 6.5.1 Safety critical software assessment shall be subject to Notified Body Approval. See Section 28.7 below.

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6.6 **Design Check Certificate**

6.6.1 The Contractor shall provide a signed design check certificate (see Table 1 below) for their total design. Where appropriate, the design shall be broken down into elements, with different design check categories being allocated to each element.

The designer's check certificate shall list the drawings, calculations or other data that it covers, together with their revision status.

The designer's check certificate shall be provided to the Employer prior to manufacture of the escalator, to enable the Project Engineer to include in the "Compliance Submission Report".

Cat	Description of items or elements of work	Check by (as minimum)
0	Unlikely to affect health and safety or operational performance, as a consequence of failure, and are not normally subject to calculation.	Another member within the Design Team.
1	Not critical to health and safety or operational performance and which may be designed using standard methods of analysis.	Another member within the Design Team, checking against the design calculations and assumptions and critically considering whether the base assumptions are valid.
2	a) Critical to health and safety or operational performance which may be designed using standard methods of analysis. b) Not critical to health and safety or operational performance, but which require complex or unusual methods of analysis.	Another Design Team within the same design organisation, but independent of the original Design Team, critically challenging the original Design Team's base assumptions.
3	a) Complex civil engineering works and other structures or permanent way schemes using non-standard or rarely-used components or design parameters which are critical to health and safety or operational performance and which require complex or unusual methods of analysis. b) Civil engineering works and other structures or permanent way schemes, otherwise subject to Categories 1 and 2 checks, which have been designed by the contractor responsible for their construction. c) Systems or equipment in asset areas other than civil engineering, which are critical to health and safety or operational performance. The adequacy of which cannot be proved in tests or pre-commissioning trials and which require complex, novel, or unusual methods of analysis.	An Independent Design Organisation having relevant knowledge and experience of the particular class of work, supplied with relevant drawings of the final designs, carrying out analyses and assessments to validate the designs without sight of those of the original design organisation.

Table 1: Cat Checks

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6.7 ***Design Risk Assessment***

6.7.1 The designer's check certificate shall be supported by a design risk assessment, confirming that all risks associated with the manufacture, installation, operation, servicing, dismantling and ultimate removal of the escalator have been considered and have been rated as "ALARP" (normally requiring a "low" or "negligible" risk score).

Reference shall be made to FMEA were applicable.

6.7.2 The implications of 2002/96/EC (WEEE) [12] regulations and the requirement for 2002/95/EC (RoHS) [13] compliance shall be clearly identified.

6.8 ***Finite Element Analysis (FEA)***

6.8.1 Where FEA is used, the *Contractor* shall provide evidence that the study has been executed, checked and approved by persons having the appropriate qualifications and experience.

7. General Technical Requirements

7.1 **Rise**

7.1.1 The Employer will advise the nominal vertical rise (subject to confirmation by survey by the Contractor after contract award) in the site-specific documentation.

7.2 **Angle of Inclination**

7.2.1 The angle of inclination shall be 30°.

7.3 **Track Radii**

7.3.1 The radius of track curvature below shall be achieved unless site constraints dictate otherwise, then BS EN 115-1: 2017, Section 5.7.2.2 & Figure 5, pg38 & 42 [1, pp. 38, 42] shall be adhered to.

Escalator Contract Speed	Track Curvature at the Upper Landing (minimum)	Track Curvature at the Lower Landing (Minimum)	Handrail Track Curvature at the Lower Landing
0.5m/s	2600mm	2000mm	Equal Lower Landing to Track Curvature
0.65m/s	2600mm	2000mm	
0.75m/s	3600mm	2400mm	

Table 2: Contract Speed Vs Track Radii

7.4 **Landing Lengths**

7.4.1 At both the upper and lower landings, the step nose shall travel horizontally for a minimum distance (see Table 3 below) from the comb line, before vertical formation takes place.

The dimensions below shall be achieved unless site constraints dictate otherwise, then BS EN 115-1: 2017, Section 5.7.2.1 & Figure 5, pg38 & 42 [1, pp. 38, 42] shall be adhered to.

Escalator Contract Speed	Landing Lengths at the Upper Landing	Landing Lengths at the Lower Landing
0.5m/s	1600mm	1600mm
0.65m/s	1600mm	1600mm
0.75m/s	2000mm	1600mm

Table 3: Contract Speed Vs Landing Lengths

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7.5 **Speeds**

7.5.1 The speed at which the escalator shall run will be 0.65m/s unless specified in the site-specific specification.

7.5.2 A maintenance speed of nominally 25% of the normal running speed shall be provided.

7.5.3 The escalator control system shall include the facility for 'stand-by operation' for slow speed operation during periods of intermittent passenger usage.

The escalator shall detect the entering of a user. Once passenger activity has been detected, the escalator shall accelerate to its normal speed. The escalator shall decelerate automatically to 50% of contract speed, for stand-by operation, following no detection of passenger movement onto the escalator for an adjustable period of time.

Acceleration and deceleration shall be at an acceptable rate of less than 0.5m/s² to achieve a smooth transition. The parameter settings and method of detection of users shall be agreed with the *Employer*.

7.5.4 A facility to over-ride stand-by operation shall be incorporated within the control system. Detailed design and password requirements shall be agreed at the design stage.

7.6 **Environmental Conditions**

7.6.1 Environmental conditions vary according to location but may be expected to be draughty, dusty and wet to varying degrees.

7.6.2 The temperature range can vary between -10°C and +50°C, with relative humidity greater than 80%.

7.6.3 Where an outdoor or weather package is required, these will be highlighted in the site-specific specification.

7.7 **Other Equipment and Station Fabric**

7.7.1 Where station finishes are disturbed or damaged by the works, the *Contractor* shall make good the affected areas, to the satisfaction of the *Employer*. This shall include making good where equipment, conduit, wiring, trunking etc has been removed, altered or installed as part of the works.

7.7.2 The drilling, cutting or welding of the station structural fabric including walls, floors, steel support beams and tunnel segments is forbidden without the written approval of the *Employer*. A cutting, drilling and fixing log shall be completed for approval.

7.8 **Abnormal Structural Loading Conditions**

7.8.1 The escalator transmission elements, truss and supports shall be designed to withstand possible abnormal loadings due to a sudden arrest of the step band (e.g. due to a step/comb collision). For such a loading condition, the integrity of the structure is to be maintained and deflection is to be limited such that there is no risk of entrapment to passengers using the escalator.

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7.9 **Duty Cycle**

7.9.1 The escalator shall be designed to run continuously all year round at the specified speed for:

- Minimum of 20 hours per day (5 days per week): **100hrs**

In addition:

- 24 hours per day (2 days per week): **48hrs**
 - Total 148hrs [per week]
 - 148 x 52 weeks = **7696 hrs** [per year]
 - 7696 x 20 years = **153,920 hrs**

During each day it may be reversed at least once, or it may run in the same direction.

7.9.2 Additionally for operational reasons, any maintained escalator may be run for up to **364 hours** in any calendar year in Engineering Hours.

7.9.3 For stations designated '**Type A**', the following duty cycle shall be applied to each daily period of twenty hours

- 100% of full load for **3.5 hrs**
- 65% of full load for **3.5 hrs**
- 50% of full load for **5 hrs**
- 30% of full load for **8 hrs**
- 2% of full load for **4 hrs** [Engineering Hours / Night Running].

7.9.4 For stations designated '**Type B**', Refer to BS EN 115-1, Annex H, pg100, [1, p. 100].

7.9.5 The full load shall be calculated at 120kg per exposed step.

7.9.6 During engineering hours the escalator may be run at inching speed, with up to 6 starts per minute, followed by a period of rest.

7.9.7 Type A stations are major interchange stations or those with high usage. Type B are all others. [This will be defined within the Site-specific specification.](#)

7.10 **Component Life Expectancy**

7.10.1 The fatigue life of all parts and assemblies shall be considered.

7.10.1.1 Parts made of steel shall be designed to BS EN 1993-1-9:2005 [14].

7.10.1.2 Parts made of aluminium shall be designed to BS EN 1999-1-3:2007+A1:2011 [15].

In all cases, the calculated fatigue life shall be infinite.

7.10.2 For each component which is subject to wear, the *Contractor* shall indicate the expected life under the specified duty cycle, together with any particular maintenance activities and interventions covering 20 years to ensure that this life is achieved.

7.10.3 For decking and balustrade design life refers to clause 20.1.1 below.

7.10.4 For the truss design life refer to clause 8.1.5 below.

7.11 **Datum Points**

7.11.1 Datum points shall be clearly defined and permanently marked in convenient locations on fixed parts of the escalator truss at both landings, as agreed with the Employer.

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7.12 **Noise, Vibration and Ride Quality**

7.12.1 Noise levels on the passenger side shall not exceed 60dB(A) measured at 1m from any point of the escalator equipment.

7.12.2 Vibration levels arising from the drive machine shall be to BS ISO 10816-3:2017 Zone A Table A2 pg 11 [16, p. 11].

7.12.3 Vibration levels for travel on the escalator shall be measured and processed in accordance with BS ISO 18738-2:2012 [17]

Note: Of particular importance is the amplitude of vibration, experienced by the passenger, caused by the interaction between the step chain and the step chain sprocket.

For example, an escalator running at 0.75m/s with a nominal step chain pitch of 133mm will have an approximate frequency of 5.64 Hz.

7.12.4 At the escalator completion stage, the achieved ride quality shall not exceed the values in Table 4: Achieved Ride Quality

Maximum at frequency equivalent to contract speed in FFT using 8 sec FFT length (mg)	Maximum RMS (mg)	Average RMS (mg)
17.5	15.0	12.0

Table 4: Achieved Ride Quality

7.12.5 Measurement of FFT and RMS shall be taken at contract speed (m/s), without load, over the length of the incline, in both the normal direction of operation and in the opposite direction.

7.13 **Bearings**

7.13.1 Components subject to continuous rotation shall be fitted with rolling element type bearings.
Bearing Life: 153,920hrs [nom]

7.14 **Castings**

7.14.1 Castings shall be free from blow-holes, sand inclusion, porosity, and chilled spots. They shall be examined for rounded, linear and planar defects using an appropriate NDE technique and shall be proven sound to a declared acceptance level, which shall be agreed with the *Employer*.

7.15 **Lubrication**

7.15.1 All moving and/or rotating components shall be lubricated with appropriate lubricant.

7.16 **Auxiliary Drive Chains and Sprockets**

7.16.1 All chains shall be ISO 'B' series standard steel roller chains, in accordance with BS ISO 606:2015 [18]. Joining links shall be retained by spring clips or split pins.

7.17 **Fixings**

7.17.1 Hexagon locknuts shall be of an all-metal type.

7.17.2 All fasteners (except fitted bolts) shall be zinc plated in accordance with BS EN ISO 1461:2009 [19] for protection against corrosion.

7.17.3 Cadmium plated fasteners shall not be used.

7.17.4 Torque values for all critical fixings shall be identified on the relevant drawings

7.18 **Shims**

7.18.1 Where shims are used for adjustment, a maximum of four shims shall be used at any one location, with total thickness not exceeding 3mm.

7.18.2 Where the adjustment gap exceeds 3mm, a thick packer shall be substituted for some of the shims.

7.18.3 All shims shall be made of metal.

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7.19 **Dimensional Constraints**

7.19.1 The following clearances shall be provided:

- a) The clearances between treads of adjacent steps, and between treads and risers of adjacent steps, shall be between 1mm and 4mm. The clearance gaps shall be equal at both left and right hand sides of the steps ¹.
- b) Where guidance of the step is achieved by the wheels or step chain, the clearance between the sides of the steps and the adjacent skirting shall be between 1mm and 3mm, and the sum of the clearances at both sides shall not exceed 5mm;
- c) The sum of the clearances between handrail lip and balustrade mouldings at any point on the escalator shall not exceed 6mm ².

7.19.2 At the landings, the steps shall be level within 2mm measured over the whole of the visible flat landing area. This is an installation tolerance, and not to be used as a design tolerance.

7.20 **Welding**

7.20.1 Welding shall be carried out to BS EN 1011-1 [20] or agreed equivalent.

7.20.2 Repairs to any weld joint, other than those classified as non-critical (NDE classification reference L4), shall only be made with the prior agreement of the *Employer*. The following information shall be submitted:

- a) Details of the weld defect(s), including type, size, position, total number of items affected and any other relevant information;
- b) A repair method statement detailing the removal of the defect(s), preparation of the weld area, weld method and subsequent NDE.

¹ An increase in step to riser clearance of up to 10% is acceptable in the area of the transition curves, subject to the written agreement of the Employer.

² These requirements are more stringent than those of BS EN 115-1:2017 [1].

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8. Truss

8.1 **General Requirements**

- 8.1.1 The site-specific documentation for a particular contract may impose additional constraints on the allowable truss dimensions, particularly where delivery routes are restricted.
- 8.1.2 The *Contractor* shall submit a CDS showing details for the proposed trusses and support systems, including civil engineering requirements for all escalators.
- 8.1.3 The truss shall comply with Civil Engineering Standards, Eurocodes.
- 8.1.4 The truss shall not rely on the surrounding concourse floor or adjacent escalators for any lateral support.
The truss shall not provide any support to the station infrastructure, except for small areas of floor plates immediately adjacent to the escalator, in the upper and lower landing areas, to be agreed with the *Employer*.
- 8.1.5 The truss shall have a design life of 120 years.
- 8.1.6 The maximum deflection of the truss shall not exceed either 3mm or 1/1500th of the span (whichever is the lesser) between adjacent supports, under full passenger loading.
- 8.1.7 Access routes may require the truss to be broken down into sections to negotiate these routes. Such sections shall be provided with precision bolted joints and all separate truss components shall be clearly marked before leaving the factory to ensure the correct sequence of assembly on site.
The contractor is responsible for ensuring the route is sufficient to the size of the delivered components / assemblies.
- 8.1.8 If the underside of the escalator truss is to have a soffit or panelling, this shall be described in the site-specific documentation.
- 8.1.9 The truss supports shall incorporate a facility for accurately aligning the escalator truss during installation the correction of alignment following any subsequent ground settlement which may take place. The minimum range for adjustment shall be ± 25 mm.
- 8.1.10 The outcome of the inspection of welding, alignment, key dimensional checks and checks of the centre line position shall be recorded on inspection sheets.
- 8.1.11 The outcome of the inspection for the torque setting on bolts shall be recorded on inspection sheets.
- 8.2 **Truss Assurance**
- 8.2.1 Certificate of Conformity for construction, materials and finishes shall be provided.
- 8.2.2 Evidence of competence of welders shall be made available.
See Table 14: Assurance / Review Documentation

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9. Tracks

9.1 **General Requirements**

- 9.1.1 Tracks shall be constructed of steel and shall be designed for maintainability and removal.
- 9.1.2 Running track wearing surfaces on the passenger side, including the upthrust tracks in the lower curve area shall be of a minimum 5mm thickness.
All curved tracks (including upthrust in lower area) on the return side shall be of a minimum 5mm thickness.
Other track surfaces shall be nominally 3mm thickness.
- 9.1.3 All joints in the track system shall be scarfed (mitred) or dovetailed and shall not be perceivable by passengers using the escalator. Tracks shall not be welded to each other.
- 9.1.4 A step and chain wheel upthrust system shall be provided which shall be continuous, so that it shall constrain the wheels to rise no more than 3mm from the running track, or for the steps to fail to form correctly at the upper and lower curves.
The upthrust system shall be provided for both left and right hand sides of upper line, on the lower line one side is acceptable.
- 9.1.5 Slide tracks shall be provided for all upthrust and running tracks, to span the gap between tension carriage and fixed tracks.
- 9.1.6 The chain wheel tracks shall be adjustable in the vicinity of the top and bottom sprocket, in such a way that the chain shall lie tangential to the sprocket pitch line on both the upper and lower sides of the sprockets.
- 9.1.7 Auxiliary tracks shall be provided at both landings, covering the length of two steps, which shall be designed to support the steps and maintain meshing of the steps through the comb, in the event of failure or loss of a step or chain wheel.
- 9.1.8 The passenger side track system shall be capable of carrying the distributed load of 300kg on each step, with no permanent deformation or initiating damage.
- 9.1.9 Where chain wheel unloading ramps are utilised, these shall have a wear-resistant renewable surface and shall be provided with a means of setting up and adjusting which does not require the removal of the step chain.
Where access is not possible from the underside, the ramps shall still be capable of inspection and adjustment.
- 9.2 **Track Assurance**
- 9.2.1 Certificates of Conformity for materials, finishes and evidence of competence of welders shall be made available.

See Table 14: Assurance / Review Documentation

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10. Steps

10.1 **General Requirements**

10.1.1 The nominal step width shall be 1.0m.

10.1.2 Individual escalator steps shall be capable of carrying the distributed load of 300kg, with no permanent deformation or initiating damage.

10.2 **Step Assurance**

10.2.1 A type test certificate shall be provided for the steps Expand refer CAT1 (link to a type test in Appendix G below).

10.2.2 Certification shall be provided to confirm the dimensional accuracy and any NDE results of sample steps and component parts.

10.2.3 A Certificate of Conformity shall be made available for individual steps or batch runs of steps.

See Table 14: Assurance / Review Documentation

10.3 **Manufacturing of Aluminium Steps**

10.3.1 On placement of contract, the Supplier shall provide a quality control plan, to demonstrate how conformity with the requirements of the steps, including rejection criteria, is achieved.

10.3.2 The Supplier shall define, within the ITP, how the following shall be controlled:

- a) Chemical composition;
- b) Die temperature;
- c) Pouring rate;
- d) Cooling rate;
- e) Dimensions;
- f) Casting visual appearance (surface defects, surface finish and sharp edges).

10.3.3 A "batch" of steps shall be defined as the quantity produced in one shift, or the quantity obtained during one operation of a furnace, whichever is the lesser.

10.3.4 It shall be possible to associate the unique identity designations, with individual batches of steps.

10.3.5 The contractor shall as part of their quality management system an "acceptance and rejection" schedule for factory defect pass / fail criterion. This document shall be made available to the employer upon request.

11. Wheels

11.1 **General Requirements**

11.1.1 Tyres shall be made of a polyurethane elastomeric material.

11.2 **Wheel Assurance**

11.2.1 A Certificate of Conformity shall be made available for the wheels and bearings for each manufacturing batch.

This certificate shall identify all of the batches comprising the order and shall confirm that each batch meets the requirements of this specification in full.

See Table 14: Assurance / Review Documentation

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12. Comb and Floor Plates

12.1 **General**

- 12.1.1 A type test calculation shall be provided for the comb and floor plate to satisfy BS EN 115-1: 2017, Section 5.2.5 pg 21 [1, p. 21].
- 12.1.2 Certificates of Conformity for manufacture, materials and finishes shall be made available.

12.2 **Comb Plate**

- 12.2.1 Comb sections shall be renewable. The tread surface shall have a grooved profile running across the width.
- 12.2.2 The comb plate assembly and supporting structure shall be designed not to deflect by more than 3mm under a load of 7.5kN uniformly distributed over the whole plan area of the plate. No permanent deflection shall be present on removal of the load.
- 12.2.3 The mesh depth of the combs into the grooves of the treads shall be at least 6mm.
- 12.2.4 Adjustable auxiliary guides shall be provided at each landing to ensure that the steps enter the comb safely. This shall not be the primary guidance.
- 12.2.5 The sensitivity of the comb switch assembly shall be adjustable in both horizontal and vertical planes so that nuisance tripping is avoided.
- 12.2.6 Comb sections (or part of) shall be coloured to give a contrast to the step.

12.3 **Floor Plate**

- 12.3.1 Hinged floor plates shall be provided at each landing, to cover the area between the back of the comb plate and the end of the escalator truss. These shall be electronically interlocked and mechanically fixed using suitable metal fixings. Due consideration to manual handling requirements shall be taken.
- 12.3.2 Each removable floor section shall have their own interlocking switch.
- 12.3.3 Where required in the site-specific specification, floor plates shall be provided for the interface between new and existing floor areas at the upper and lower landings. A suitable means of fixing the floor plates shall be provided and agreed with the Employer. The requirements shall comply with sections 12.2.1 & 12.2.2 above.
- 12.3.4 Each floor plate shall be capable of supporting, and cause no permanent deformation, the greater of:
- A total imposed load of 7.5kN uniformly distributed over the whole plan area of the plate;
 - A uniformly distributed load of 5kN/m² over the whole plan area of the plate.
- 12.3.5 The design of the floor plates and supports shall take into account the loading parameters applied by the maximum passenger throughput on the escalator, according to the duty cycle quoted in 7.9 above of this specification.
- 12.3.6 Each floor plate shall have a fire resistance of thirty minutes.

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13. Shafts

13.1 *Shaft Characteristics*

- 13.1.1 Shafts shall have no potential for failure, under all operating conditions described in this specification. Any welding shall be done to BS EN 1011-1 [20], or agreed equivalent, and shall be inspected by an appropriate method to demonstrate integrity.
- 13.1.2 All sprockets shall be mounted on hubs and be located against shoulders on the hubs to ensure accurate location, and to ensure that the loads due to chain tension are not taken wholly by the retaining bolts.
The hubs shall be welded or keyed to a common shaft.
- 13.1.3 Where welded joints are used they shall be fully accessible for periodic examination. Examination shall be possible with the shaft in-situ and without the need to dismantle the shaft.
- 13.1.4 Where keyways are used they shall have corners with radii, which shall be inspected before assembly of the shaft and the results made available for review by the *Employer*.
- 13.1.5 The shaft assembly shall be supported on self-aligning bearings. Means shall be provided, to enable accurate positioning of the shaft.
The bearing mountings shall be fixed in a manner which prevents horizontal and vertical movement after positioning.
- 13.1.6 The outcome of the inspection for the torque setting on bolts, alignment and dimensional accuracy, including run-outs and concentricity, of the assemblies shall be recorded on inspection and test sheets.
- 13.1.7 Certificates of Conformity for bearings, materials, heat treatment, finishes, NDE and where applicable evidence of competence of welders shall be made available.

13.2 *Sprocket Characteristics*

- 13.2.1 The pitch circle diameter of step chain sprockets (and hence the number of teeth) and the sprocket profile shall be selected and designed to ensure that the drive characteristics in reference to running vibrations, defined in clause 7.12.5 above are met.

13.3 *Main Drive Shaft*

- 13.3.1 Where auxiliary brakes are located on the main drive shaft these shall also be mounted on hubs.
- 13.3.2 It shall not be possible for a failure of the shaft at any single point, to disengage the drive and render all mechanical brakes ineffective, simultaneously.

13.4 *Tension Carriage*

- 13.4.1 The tension carriage shall comprise an idler shaft mounted on a moveable frame.
- 13.4.2 Both step chain sprockets shall be fixed to the idler shaft to maintain accurate alignment of the sprocket teeth throughout the life of the step chain.
- 13.4.3 The tension carriage shall be guided to provide both horizontal and lateral location and free parallel movement throughout travel.
- 13.4.4 Tensioning devices shall be fitted to each side of the carriage to maintain tension on the step chain. The devices shall be adjustable and shall provide a constant force throughout the travel of the carriage.
- 13.4.5 A switch shall be provided, to detect an outward and inward carriage movement. The switch shall be manual reset type. The switch-operating device shall be adjustable to allow for movement of the tension carriage, throughout its normal operating range.

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14. Step Chain

14.1 **General Requirements**

14.1.1 The step chains shall be of a roller type.

14.2 **Chain Design**

14.2.1 The bearing pressure in the bushes shall not exceed 20N/mm^2 (MPa) under a load of 120kg per exposed step.

14.2.2 A method shall be available to compensate for chain elongation and maximise chain life (i.e. cranked links or adequate carriage movement).

14.3 **Chain Assurance**

14.3.1 The *Contractor* shall state the predicted service life of the chains, and shall provide documentary evidence (calculations and test reports), prior to manufacture, to assure the *Employer* that the predicted service life will be achieved in practice.

See Table 14: Assurance / Review Documentation

14.3.2 The Contractor shall demonstrate by calculation and type test that the materials and heat treatment used in the construction of the chain have been selected to give the required strength, ductility, fatigue and wear resistance. The calculations shall address all potential failure modes for each component.

The materials used for the link plates shall have adequate shock resistance to endure all normal and abnormal loadings due to a sudden arrest of the step band.

See Table 14: Assurance / Review Documentation

14.3.3 A type test certificate and supporting documentation, confirming the tensile breaking load of the assembled step chain and half links (where part of design), shall be provided from a recognised test authority. This shall include a load/extension diagram and photographic evidence of the failure mode.

See Table 14: Assurance / Review Documentation

14.3.4 The Contractor shall carry out a type test for each chain size, as detailed in the agreed contract quality plan, (see Appendix D), at a suitably equipped test house, or provide evidence that these tests have already been undertaken.

See Table 14: Assurance / Review Documentation

14.3.5 The outcome of the inspections to confirm the dimensional accuracy, surface finishes and heat treatments of the step chain assemblies and component parts shall be recorded on inspection and test sheets. Certificates of Conformity for materials, heat treatment and surface finishes shall be made available.

See Table 14: Assurance / Review Documentation

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15. Lubricator [Mechanical]

15.1 **General Requirements**

15.1.1 An electrically driven central lubrication pump shall be fitted in an easily accessible location to lubricate all chains, including the step chains. This system may also be utilised to lubricate other escalator components.

15.2 **Lubricator Design**

15.2.1 The lubrication pump shall be controlled as described in Section 40 below.

15.2.2 The lubrication pump shall provide one outlet per delivery point. The rates of feed for each outlet shall be adjustable.

15.2.3 The lubricator reservoir shall have sufficient oil capacity to run under the required duty cycle for a period of not less than four weeks, without topping up. A means of measuring the oil level shall be provided.

15.2.4 Oil feed pipes shall be run in positions where they are not prone to damage and will not preclude maintenance. All pipes shall be labelled. A notice shall be provided near the pump to give the destination of each feed pipe.

15.2.5 Non-return valves shall be fitted, as recommended by the lubricator manufacturer.

15.3 **Lubricator Assurance**

15.3.1 Certificate of Conformity for the lubricator shall be supplied.

See Table 14: Assurance / Review Documentation

See Section 44.8 below on page 60.

See Section 40 below on page 52.

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16. Handrail System

16.1 **General**

16.1.1 The escalator shall be provided with two endless handrails, with factory made joints where practicable.

Where this is not possible, control processes and procedures for ensuring quality and consistency of jointing shall be agreed with the *Employer*.

16.1.2 Each handrail shall have only one joint

16.2 **Handrail Design**

16.2.1 The base compound shall be a polymer.

16.2.2 The external surface of the handrail shall be black in colour, except for the direction indicators.

16.2.3 Direction indicators, consisting of 18-25mm diameter circles of yellow coloured (e.g. RAL 1003 Signal Yellow), shall be formed within the handrail cover at the manufacturing stage. These shall be on the centre line of the handrail, spaced at 1m \pm 0.05m intervals throughout the full length of the handrail.

16.2.4 The width of the handrail shall be no less than 75mm and no more than 85mm.

16.3 **Handrail Construction**

16.3.1 The joint shall be fully spliced, and shall be virtually indistinguishable from the rest of the handrail. The tolerance on the stated length of handrails with factory made joints shall be \pm 0/-25mm.

16.3.2 When mounted on the guide track, the handrail shall be straight (i.e. free of kinks) within \pm 2mm measured over any 500mm length.

Outer cover surface defects shall number not more than one in any 3m length of handrail and shall meet the following acceptance criteria:

Dents and bumps shall be acceptable, if they deviate less than 0.5mm from the general surface of the cover.

Over a length of 500mm, which includes a joint, a deviation of up to 1.5mm is acceptable;

Outer cover surface scratches shall be acceptable, providing their width is less than 0.1mm and their length less than 100mm;

There shall be no blisters, caused by air pockets.

16.4 **Handrail Assurance**

16.4.1 Certificates of Conformity shall be provided confirming the dimensional accuracy and outer cover surface quality.

16.4.2 Evidence is required that the type tests for the escalator handrail (described in Appendix E) have been undertaken.

See Table 14: Assurance / Review Documentation

16.5 **Handrail Drive System**

16.5.1 If chain driven newel wheels are used, they shall be fitted with rolling element bearings.

16.5.2 If newel wheels are used they shall be imperforate or covered, so as not to present a hazard to maintenance staff.

16.6 **Chain Design**

16.6.1 If chains are used they shall have a means of tension adjustment, which shall be easily accessible.

16.7 **Chain Assurance**

16.7.1 Certificates of Conformity shall be provided for all auxiliary chains.(if applicable)

See Table 14: Assurance / Review Documentation

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17. Step Band Anchor System

- 17.1.1 A means shall be provided to allow the step band to be mechanically anchored / locked without the use of the brakes.
- 17.1.2 The design of the anchoring/locking device shall be capable of sustaining the live load of walking passengers and satisfy the factor of safety defined in BS EN 115-1: 2017, Section 5.12.2.6.3 & Table 8 pg 56 [1, p. 56]. See Section 31.4 below.

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18. Brakes

18.1 **Brake Design**

- 18.1.1 Electro-mechanical brakes shall be fitted to the high speed side of the gearbox.
- 18.1.2 If chain drives (single or double sided) or a single sided geared direct drive are used, a head shaft auxiliary brake shall be fitted.
For all designs an auxiliary brake shall be fitted.
- 18.1.3 Mechanical brakes shall be spring applied, and electro-magnetically released.
- 18.1.4 The brake springs shall be of the compression type and shall be arranged to ensure equal pressure on each brake shoe.
- 18.1.5 Mechanical brakes shall be adjustable, throughout the life of the friction material. The brakes shall be designed such that all wearing components shall be easily replaceable.
- 18.1.6 Brake linings shall be asbestos-free. It shall be possible to inspect the lining thickness without dismantling the brake.
- 18.1.7 When the escalator is stationary, both operational and auxiliary brakes shall be engaged.

18.2 **Braking Logic**

- 18.2.1 The supplier shall provide details of braking logic for the entire system for all mode of activation.

18.3 **Safety Circuit**

- 18.3.1 Overspeed and undervoltage detection shall be provided. This shall be located such that any single point failure will not render the device ineffective.
- 18.3.2 A switch shall be provided to detect that each brake shoe has lifted fully. It is permissible for the escalator starting circuit to bypass this switch but it shall not be possible for the escalator to continue to run unless the switch has been activated.

18.4 **Inverter Braking**

- 18.4.1 Inverter braking may be used as the primary method for bringing the escalator safely to a stop. Operational and functional details are given in section 37.7 below

18.5 **Brake Design**

- 18.5.1 The escalator brakes shall be entirely fail safe in their operation.
The escalator shall not exceed 120% of the nominal speed under any circumstances, including fault conditions. This shall take account of the calculated increase in speed that would occur during mechanical and electrical response times.
- 18.5.2 Detailed braking performance calculations shall be supplied to the *Employer*, prior to manufacture.

18.6 **Integrity Protection**

- 18.6.1 Suitable measures shall be taken to ensure that contaminants, such as oil, cannot ingress and detrimentally affect the braking performance of the mechanical [Aux or Operational] braking systems.

18.7 **Maintainability**

- 18.7.1 It shall be possible to remove and replace the motor in the drive unit without disturbing the brake. If this is not practical, the Contractor shall demonstrate that the brakes can be reset to meet the stopping requirements.

18.8 **Walk Down Provision**

- 18.8.1 The operational requirement in stations requires the need for escalators to be used as "walk downs". This requires the both brakes to stay applied.

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18.9 **Assurance**

18.9.1 Certificates of Conformity shall be provided for all brake units.

18.9.2 Testing and inspection of the brakes shall be accordance with the procedures given in the weight testing provision sited as per BS EN 115-1: 2017, Section 7.3 pg 73 & 74 [1, pp. 73, 74].

See Table 14: Assurance / Review Documentation

See Section 35.3 below on page 46

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19. Drive Unit

19.1 **General Requirements**

- 19.1.1 Where the complete drive and braking system is to be mounted within the upper landing truss, it shall not be within the step band, unless existing station civil constraints dictate otherwise. Refer to clauses 7.3 above and 7.4 above to determine solution.
- 19.1.2 Depending on load requirements, a dual or a single sided drive system can be supplied. The escalator main shaft (headshaft) can be driven via chains or reduction gears. The Contractor must be mindful of clause 17 above.
- 19.1.3 Lifting eyes shall be provided to lift the drive unit.

19.2 **Assurance**

- 19.2.1 Testing and inspection of the drive unit shall be in accordance with the procedures given in Appendix F. Certificates of Conformity shall be provided.
- 19.2.2 Drive unit, including motor size selection calculations shall be supplied to the *Employer*, prior to manufacture.

See Table 14: Assurance / Review Documentation

19.3 **Gearbox**

- 19.3.1 The expected life for strength and wear shall be calculated in accordance with the appropriate standard, and shall be in excess of **153,920** hours [See Section 7.9 above].

For the purpose of calculations:

- Steady load, equivalent to that which would be transmitted to the gearbox when the motor is running at full speed
- Supplying 75% of its normal rated maximum motor power shall be assumed.

- 19.3.2 A method of determining the oil level shall be provided.
- 19.3.3 A low oil level switch shall be provided section 31.3 below.
- 19.3.4 A drain point, fitted with a valve or tap at an easily accessible point, shall be provided.
- 19.3.5 A means of oil sampling shall be identified.
- 19.3.6 A plate shall be fixed to the reduction gear casing, stating:
- a) Manufacturer;
 - b) Date of manufacture;
 - c) Type or model number of gearbox;
 - d) Serial number;
 - e) Recommended lubricant;
 - f) Quantity of lubricant;
 - g) Gearbox ratio.

19.4 **Motor**

- 19.4.1 For requirements of motor details, see section 36 below.

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20. Balustrade and Decking System

20.1 **General Requirements**

20.1.1 The balustrade and decking system shall have a designed life of at least 20 years.

20.2 **Balustrade**

20.2.1 The horizontal distance between the outer edge of the handrail and any fixed part of the escalator or station fabric shall be not less than 80mm. As per BS EN 115-1, Annex A, Section A.2.2, pg 78. [1, p. 78].

20.2.2 Balustrade and decking panels shall be supported on a steel framework. The design shall be suitable for use in a public service environment.

20.2.3 Balustrade interior panels shall be readily removable from the passenger side, at locations where access for maintenance is required, without having to gain access from behind the panels.

20.2.4 All balustrade cladding shall be made of metal. Balustrade interior panels shall have all external faces finished to 120 grit or finer in the direction of passenger movement.

20.3 **Balustrade Assurance Compliance / Testing**

20.3.1 The balustrade shall be designed such that a point load of 50N applied by hand, at the centre of a panel adjacent to any edge, shall deflect the panel by less than 0.5mm relative to the adjacent panel.

20.3.2 The balustrade and decking shall be designed and supported such that it can support a weight of 1000N applied over an area of 50mm x 50mm without any permanent deformation.

20.3.3 When a force of 500N is applied to the balustrade panels at any point of the panelling at right angles over an area of 50mm x 50mm, there shall be no gap greater than 1mm and no permanent deformation.

See Table 14: Assurance / Review Documentation

20.4 **Balustrade Installation**

20.4.1 The Contractor shall be responsible for integrating the decking panels with the adjacent station fabric or adjacent existing escalator or staircase and shall submit a design proposal, showing how this is to be accomplished. Where there is a step between adjacent balustrades due to a different design, the two profiles are to be made good.

20.4.2 Where there is a drop of more than 1.5m at the outside of the escalator decking, a safety barrier shall be provided to stop persons and objects from falling over the edge of the decking. The design of this barrier is to be agreed with the *Employer*.

20.4.3 [The site-specific documentation will clarify any requirements for such barriers. This includes the potential of modifying existing balustrades.](#)

20.4.4 Means shall be provided to prevent vibration (drumming) of the balustrade panels.

20.5 **Skirting Design**

20.5.1 The panels shall be painted steel with a semi-gloss finish, with the lowest practicable coefficient of friction. If unpainted they shall be constructed from stainless steel.

20.5.2 The depth of the skirting panels shall be such that the loss of a wheel tyre and/or tread cleat will not cause a visible gap to occur between the top of the step tread and the bottom of the skirting panel, at any point.

20.6 **Skirting Assurance Compliance / Testing**

20.6.1 The skirting shall deflect no more than 2mm under a single force of 1500N acting at right angles over an area of 50mm x 50mm, at the most unfavourable point.

See Table 14: Assurance / Review Documentation

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20.7 **Brush Guard**

- 20.7.1 A continuous flexible skirt guard of the double brush type, shall be mounted on the skirting panels, to protect the step-to-skirting gap.
- 20.7.2 The brush guard shall extend from a point 140-150mm from each comb line, (going towards the EWP). The length of extension shall be matching on both sides.
- 20.7.3 The brush material shall be nylon, of black colour. The brushes shall be held captive in slotted aluminium extrusions fixed to the skirting panels.
- 20.7.4 The ends of the brush guard shall be tapered towards the skirting panel over a length of 150mm and shall terminate in a tapered aluminium capping piece.

20.8 **Brush Guard Assurance**

- 20.8.1 Certificates of Conformity for materials and panel and steelwork finishes shall be made available.

See Table 14: Assurance / Review Documentation

20.9 **Newel End Equipment**

- 20.9.1 At each landing the Contractor shall provide a design for the newel equipment for acceptance by the Employer. The following facilities shall be provided at each landing:-
- a) 'Start up', 'start down' key operated switches and where inverter braking applies, 'stop,' key operated switches. See section 31.6 below and section 16 for operational requirements;
 - b) Fixings for attaching an engineers' maintenance barrier;
 - c) Retractable 'Tensator' tape barriers;
 - d) [The escalator number \(as described in the site-specific documentation\)](#);
 - e) Lockable enclosures, with standard lock barrels, housing an inching socket
 - f) The escalator manufacturer's name and 'CE' marking, in a location to be agreed with the Employer.
- 20.9.2 The keys specified in clause 20.9 above shall be identical.
The key type shall be LUL standard escalator key RKL271.
- 20.9.3 Handrail Entry Guards shall be easily removable for access for cleaning.
- 20.10 **Safety Circuit**
- 20.10.1 A means shall be provided to detect the entering of a user, onto the escalator, for stand-by operation as BS EN 115-1, Section 5.12.3.3, pg 62. [1, p. 62]. See section 38 below.
Details shall be agreed with the *Employer*.
- 20.10.2 Passenger emergency stop switches shall be fitted to the balustrade decking. See section 32 below for further information, including quantity and location.

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21. Guarding

21.1 **General Requirements**

21.1.1 Guarding shall meet the requirements of the Supply of Machinery (Safety Amendment) Regulations 2008, BS EN ISO 13857: 2008 [21].

21.2 **Guarding Design**

21.2.1 The removal or fitting of individual guards shall not require the dismantling of other guards or escalator components.

21.2.2 The guards shall not permanently prevent access to any area, nor shall they prevent egress from any area in the case of an emergency.

21.2.3 The guards shall not affect the operation of the escalator in any way or prevent access to emergency stop switches or inching sockets.

21.3 **Passenger Side Temporary Guarding**

21.3.1 For maintenance purposes, the following barriers shall be provided to prevent access by unauthorised personnel and the *Contractor* shall implement safe systems of work, which shall be submitted to the *Employer* for acceptance.

A lockable barrier shall surround the escalator working area. The barrier shall give 300mm minimum working space either side of the floor plate opening, 600mm minimum working space behind the opening and a minimum height of 1100mm.

21.3.2 The design of the guard shall meet all the Employer's operational and safety requirements.

21.3.3 The design of the barrier shall be agreed with the Employer.

- a) One barrier shall be provided for each of the upper and lower landings, per flight of escalators.

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22. Machine Room Guarding

22.1 *General Requirements*

22.1.1 Refer to site specific specification if applicable and Appendix D.

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23. Oil and Dust Trays

23.1 *General Requirements*

23.1.1 Drip trays shall be fitted under sprockets, auxiliary drive chains and step chains.

Means shall be provided for collecting and removing the waste oil from the lowest point of the system. The facility for waste oil removal shall be easily accessible.

23.1.2 A detritus collection system shall be provided at the upper and lower reversing stations, to catch dust and other debris thrown from the steps.

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24. Passenger Signs and Notices

24.1 *General Requirements*

24.1.1 Stand On The Right, Hold the Handrail' notices (as appropriate) shall be mounted on the centre decking panels between adjacent escalators, spaced at a maximum pitch of 8m, provided that no such notice shall be positioned within 1m of an emergency stop 'half-diamond' switch. These shall be used to compliment the requirement for anti-slide devices in BS EN 115-1, Section 5.5.2 Figure 3, pg 32 & 42, [1, p. 32 & 42].

Where the decking at the side of an escalator exceeds 750mm in width, notices shall be fitted in a position corresponding to those on the centre decking. The notices shall be secured to the steelwork below the decking and not to the decking panels only.

To LUL drawing 36-913 or 36-917. Where there is a step between new and existing decking, the gap is to be made good with an infill piece.

24.1.2 Passenger warning notices shall be installed on the wall adjacent to the escalators, one per landing in a location as instructed by the Employer. To LUL drawing 384-991. Where a central escalator is being renewed, this clause shall be ignored.

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25. Escalator Power Supply

25.1 **General Supply Requirements**

25.1.1 The escalator shall operate from a nominal 400Va.c. 3 phase and neutral 50Hz supply.

The *Employer* will confirm the source and tolerance levels of the supply at the time of placement of the contract (see Section 26 Power Supply Harmonics and site-specific documentation).

See Table 14: Assurance / Review Documentation

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26. Power Supply Harmonics

26.1 **Escalator System Immunity**

26.1.1 The electrical system shall be designed for immunity to harmonics in accordance with the levels present on a supply as defined in BS EN 61000-2-4, Section 4, Electromagnetic Environment Classes, pg. 10. [22, p. 10].

Environmental EMC Classification: **Class 3 Industrial** ^{3 4 5}

26.2 **Escalator System Emissions**

26.2.1 The escalator electrical system shall comply with BS EN 61000-3-4: 1998, Section 5 pg 3 & Table 1~Stage 1 current emissions values for simplified connections [23, p. 3 & 4].⁶

26.2.2 The electrical system must take into account planning levels for 400V systems, specified in G5/4-1 [24].

26.3 **Power Supply Harmonic Pre-Assessment**

26.3.1 Following award of contract the *Employer* will perform tests to determine the level of Total Harmonic Distortion (THD) present in the mains power supply and provide the *Contractor* with a copy of the test results, carried out over a period of 4 days, including the complete weekend.

See Table 14: Assurance / Review Documentation

26.4 **Power Supply Harmonic Post-Assessment**

26.4.1 Within 4 weeks of the escalator load being applied the *Contractor* shall provide a report of a site test of harmonic characteristics, carried out over a minimum period of 4 days, inclusive of the complete weekend.

If the escalator electrical system is not compliant to BS EN 61000-3-4: 1998, Section 5, pg 3 & Table 1~Stage 1 current emissions values for simplified connections [23, p. 3 & 4] the contractor will have to contact the employer to allow the Power Supply difference to be assessed.

See Table 14: Assurance / Review Documentation

26.4.2 The *Contractor* shall provide details of the harmonic injection currents (Amps) for up to the 50th Harmonic.

The *Employer* will submit a revised load application.

See Table 14: Assurance / Review Documentation

³ Both LUL and DNO supplies are nominally 400Va.c. 3 phase 50Hz but the LUL supply has inherently higher harmonic levels.

⁴ BS EN 61000-4-13 [12] provides further details of the levels of harmonics that are likely to be present in an industrial environment together with suitable test methods to demonstrate equipment immunity compliance.

⁵ The 11th and 13th harmonics, which are derived from the LUL DC traction system, are higher than generally encountered.

⁶ The supply Rsce is assumed to be 33.

27. IP Rating

27.1 *General Requirements*

- 27.1.1 All electrical equipment shall be designed and certified for Ingress Protection to BS EN 60529: 1992+A2: 2013, Tables I to 3, pg. 9, 10 & 12 [25]
- 27.1.2 All electrical equipment will be IP rated to:

A	All electrical equipment IP 54 [Minimum]
B	IP Rating of High heat output components will be IP 54 [Minimum]
C	IP Rating of the Rotary Encoder will be IP 65 [Minimum]
D	IP Rating of the Station Operations Room escalator status indication panel will be IP 23 [Minimum]
E	IP Rating of the Passenger Emergency Stop Switches will be IP 41 [Closed]
	IP Rating of the Passenger Emergency Stop Switches will be IP 21 [Open]

Table 5 Electrical IP Rating

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28. Controller Design

28.1 **EMC**

- 28.1.1 All individual AC powered apparatus, rated less than or equal to 16A per phase, shall meet the applicable requirements in accordance with BS EN 61000-3-2, Table 1 – Limits for Class A Equipment, pg. 20. [26, p. 20]
- 28.1.2 If applicable equipment with designed rated currents >100A will require to be designed to BS EN 61000-3-12:2011 [8]
- 28.1.3 The escalator controller shall be designed in accordance with BS EN 12015: 2014 [27] and BS EN 12016: 2013 [28].
- 28.1.4 The escalator controller shall be compliant with the requirements of the European EMC Directive 2004/108/EC and Statutory Instrument 2006/3418.
- 28.1.5 An assessment against the requirement to the Railway EMC regulations will need to be completed as part of the directive assessment.

28.2 **General Compliance**

- 28.2.1 The electrical installation and equipment associated with the escalator design shall be in accordance with the *Contractor's* EMC Control Plan.
- 28.2.2 The Contractor (jointly with the Employer) shall carry out an EMC HAZID assessment of the escalator and its environment.
To confirm potential threat of EMC immunity to other systems within the environment due to EMC emissions.
See Table 14: Assurance / Review Documentation
- 28.2.3 On completion of EMC testing or submission of historic certification, a technical file, including test report(s) and declaration of conformity with the EMC Directive shall be provided.
See Table 14: Assurance / Review Documentation

28.3 **Controller System**

- 28.3.1 The safety integrity level (SIL) for any safety circuit and controller protocols shall be verified through a Certified Notified Body and associated performance certification.
See Table 14: Assurance / Review Documentation

28.4 **Man Machine Interface**

- 28.4.1 A real-time visual display screen shall be provided on the front of the controller. It shall be an LCD type with integrated keypad for interrogation purposes.
- 28.4.2 The screen shall be located where fault code interrogation can be carried out by operational staff. This is to be agreed with the employer.
- 28.4.3 Status and fault messages shall be displayed on the controller screen.
For Standard Controller Interrogation.

A	The last 100 faults [time stamped]
B	The last stopping distance
C	Stand-by operation 'on'/'off'
D	Direction of Travel
E	Speed of Travel

Table 6 Minimum MMI Display Information

28.5 **Engineer / User Security**

- 28.5.1 A level of Security shall be created to protect the asset / software being adjusted without authorisation.

A	Standard Interrogation	Visual Review	No password
B	Maintainer Engineer level	Running Parameter Input	Requires Password
C	Installer Engineer Access	Software Installation / Major Repair	Requires Password Access

Table 7 Software Security Interface Protocol

28.6 **External Communication Protocol**

- 28.6.1 Provision shall be made to allow access to other statistical data through a cloud based data exchange. Data recorded but not listed through the MMI will be accessible through this system. See Section 29 below.

28.7 **Software**

- 28.7.1 The safety integrity level (SIL) for the software shall be verified through a Certified Notified Body and associated performance certification.

See Table 14: Assurance / Review Documentation

28.8 **Controller 0V Output**

- 28.8.1 The controller shall provide, as a minimum, a means to allow communication to the existing communication system.
- 28.8.2 The employer will supply the current functional communication system to the supplier.
- 28.8.3 The supplier will provide a means of interface to said system, for example, to allow communication to the Station Operation Room, safety systems including cameras etc...

	Indication	0V Output	
1	POWER ON	0V Contact	SOR
2	STOPPED	0V Contact	SOR
3	UP	0V Contact	SOR
4	DOWN	0V Contact	SOR
6	PASSENGER EMERGENCY STOP OPERATED [Lower]	0V Contact	SOR
7	PASSENGER EMERGENCY STOP OPERATED [Upper]	0V Contact	SOR

Table 8: Controller 0V Output Requirements

28.9 **Monitoring Circuit 0V Requirements**

- 28.9.1 To ensure that that controller operates correctly when additional switches are activated.

	LUBRICATION POWER MONITORING ⁷	0V Contact	Asset Protect
	LOW OIL CONTACT ⁸	0V Contact	Asset Protect

Table 9: Other 0V Contacts

28.10 **Controller Operational Pushbuttons**

- 28.10.1 To assist the operation assurance and testing, additional buttons are to be provided for:
- Normal / Inch / Test ~ 3 way switch
 - Reset Switch ~ Positive Displacement Type
 - Start Switch ~ Up; Positive Displacement Type
 - Start Switch ~ Down; Positive Displacement Type
 - Emergency Stop; Latching, Twist reset

⁷ See Section 31 for additional Operational Monitoring requirements.

⁸ See Section 40 for Lubricator Monitoring requirements.

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See Section 39 below for Inching Operation and Testing.

28.10.2 If a means of control can be provided for the operational and testing requirements the need for control buttons on the controller panel can be removed. This is to be agreed with the Employer.

28.11 ***Device Status Monitoring and Reset***

28.11.1 A 'controller reset' facility shall be incorporated to prevent restarting of the escalator following the operation of a safety device (and subsequent local reset).

- Operation of a safety circuit protective device
- Protective circuit or main power
- Driving/braking failure contactor

28.12 ***Non Operational Resetting Requirements***

28.12.1 The defined safety devices do not require a 'controller reset' as they are operationally omitted:

- Passenger emergency stop switches: mechanically reset by key in lid
- Emergency stop switch isolator
- Emergency stop pushbuttons on truss: latching button - twist to release;
- Dummy plugs for handheld inching device sockets: replace dummy plug;
- Emergency stop on handheld inching device: latching button - twist to release.

28.13 ***Remote Escalator Status Indication (Station Operations Room)***

28.14 ***General Requirement***

28.14.1 It shall be agreed with the employer and contractor that the requirements for the status indications are implemented for the operational monitoring of the escalators.

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29. External Communications [SCADA]

29.1 **General Requirements**

29.1.1 The Contractor shall fit a communication processor and interface device that enables external communication.

29.1.2 Provision shall be made so that the escalator data, such as alarm records and fault logs, shall be available to be interrogated through direct access, local panel or internet cloud access.

The Contractor shall advise the Employer of the options available to communicate with a remote escalator status monitoring, local panel or internet cloud access

See Table 14: Assurance / Review Documentation

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30. Safety Circuit Switches and Stop Devices

30.1 **General Requirements**

- 30.1.1 The contractor shall submit compliance certification to the appropriate SIL levels in accordance with BS EN 115-1: 2017, Section 5.12.2.6.3 & Table 8 pg 56 [1, p. 56].
- 30.1.2 The disconnect times of all circuits shall be compliant with BS 7671, Section 411.3.2.2 Table 41.1, pg 55 [29, p. 55].

30.2 **Safety Circuit Protection**

- 30.2.1 Where the safety line voltage is 50V or more, it shall additionally be protected by a manually resettable 30mA RCD.

See Table 14: Assurance / Review Documentation

- 30.2.2 The contractor shall provide the procedure for periodic testing of electric safety devices that are not SIL compliant [self-checking].

These tests shall be practical to implement and shall not permit the escalator to be returned to service in an unsafe condition.

The procedures shall be included within the operation and maintenance manual.

See Table 14: Assurance / Review Documentation

30.3 **Banned Sensor Types**

- 30.3.1 Photoelectric (optical) sensors shall not be used as a safety critical device.

This does not preclude the use in passenger activation requirements. See Section 38 below. ⁹

30.4 **Field Bus Systems**

- 30.4.1 Field bus systems can be used as long as they fully comply with the SIL requirements in accordance with BS EN 115-1: 2017, Section 5.12.2.6.3 & Table 8 pg 56 [1, p. 56].

Also in accordance with BS EN 62061: 2011.

- 30.4.2 Provide comprehensive details of Certificates of Conformity provided by a Certified Notified Body for all safety devices that have been implemented as programmable electronics safety systems (PESS).

Required Assurance Submission

30.5 **Programmable Electronic Safety Systems (PESS)**

- 30.5.1 Where programmable electronic safety systems (PESS) are used to implement safety devices, the Contractor shall:

For safety devices required by BS EN 115-1: 2017, Section 5.12.2.6.3 & Table 8 pg 56 [1, p. 56], confirm the safety integrity level (SIL) achieved..

- 30.5.2 Provide conformation that the test procedures for PESSRAE, stated in Annex D of BS EN 115-1 [1] have been followed and that the design guidelines have been followed.

- 30.5.3 Provide comprehensive details of Certificates of Conformity provided by a Certified Notified Body for all safety devices that have been implemented as programmable electronics safety systems (PESS).

⁹ The use of 'optical' safety devices is prohibited in the Employer's environment because experience has shown that dust and dirt build-up on the outside of optical devices causes spurious tripping, with the resultant risk of passenger cascade falls and service disruption.

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31. Operational Safety Switch / Monitoring

31.1 ***Brake Wear Switches***

31.1.1 Brake wear switches shall monitor and detect excessive brake lining wear.

LU Operational Requirement additional to BS EN 115-1, Table 8, pg 56. [1, p. 56]

31.2 ***Handrail Switch***

31.2.1 A broken or excessively stretched handrail, or loss of tension, shall be monitored and detected by a handrail switch.

LU Operational Requirement additional to BS EN 115-1, Table 8, pg 56. [1, p. 56]

31.3 ***Low Oil Switch***

31.3.1 A low oil switch shall monitor and detect insufficient oil within the gear case.

Activation of a 'gearbox oil level low switch' while the escalator is running shall not cause the escalator to stop.

It shall not be possible to restart the escalator until the oil level is restored to the correct operational level.

LU Operational Requirement additional to BS EN 115-1, Table 8, pg 56. [1, p. 56]

31.4 ***Topshaft Anchor Switch***

31.4.1 A Step Band Anchor switch shall monitor and detect failure to remove the step band anchoring device prior to attempting to start the escalator (See Section 17 above).

LU Operational Requirement additional to BS EN 115-1, Table 8, pg 56. [1, p. 56]

31.5 ***Underspeed Detection***

31.5.1 Step Band underspeed shall be monitored by safety devices with suitable resolution.

LU Operational Requirement additional to BS EN 115-1, Table 8, pg 56. [1, p. 56]

31.6 ***Operator Accessible Stop Key Switches***

31.6.1 Where inverter braking applies, a 'stop' key switch shall be provided at each upper and lower balustrade. This is to be agreed between the employer and contractor at specific location(s).

31.6.2 Operation of this key switch shall stop the escalator by application of the mechanical brakes.

LU Operational Requirement additional to BS EN 115-1, Table 8, pg 56. [1, p. 56]

32. Passenger Emergency Stop Switches

32.1 **General Requirements**

32.1.1 Passenger emergency stop switches (known as 'diamonds') shall be provided to LUL drawing number 584-949.

32.2 **Passenger Emergency Stop Positioning**

32.2.1 Upper and Lower Passenger emergency stop switches shall be fitted on the¹⁰:

- Top Landing Balustrade, left and right hand side
 - In line with the comb [Approx]
- Bottom Landing Balustrade, left and right hand side
 - In line with the comb [Approx]

32.3 **Incline Positioned Passenger Emergency Stop**

32.3.1 If the escalator is above 10m rise additional stop switches shall be fitted on the incline balustrade decking.

32.3.2 The number of stop switches on the incline shall be installed [site conditions applicable] as defined in

32.3.3 Table 10.

Maximum spacing of 15m measured along the decking.

The exact spacing shall be arranged such that the position of the stop switches does not coincide with decking panel joints¹¹.

Rise	No. of stop switches on incline
<10m	0
≥10m <12.5m	1 on each side of the step band
≥12.5m <17.5m	2 on each side of the step band
≥17.5m <25m	3 on each side of the step band

Table 10: Additional Passenger Emergency Stop Switches

32.3.4 The space between the stop switches and the handrail shall be not less than 150mm, and no greater than 500mm.

32.3.5 Where passenger emergency stop switches are fitted between two escalators, each pairing shall be longitudinally aligned.

32.4 **Fixed Staircase Emergency Stop Position**

32.4.1 Where a fixed staircase is located adjacent to an escalator, additional 'half diamonds or diamonds', aligned with those on the escalator, shall be installed, with their push panels facing the staircase.

Where the decking between an escalator and a fixed staircase is greater than 1400mm measured between the escalator handrail and the edge of the staircase, no additional 'half-diamonds' shall be fitted.

¹⁰ All push panels are to be positioned facing into the step band of the escalator.

¹¹ This requirement exceeds the requirements of BS EN 115-1

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32.5 ***Passenger Emergency Stop Functionality***

32.5.1 When the push panel of a passenger emergency stop switch is operated, it shall remain in the pushed position. The red LED (in the lid) shall illuminate and remain illuminated until the push panel is reset. The panel shall be released mechanically, by turning a key in the lid of the switch housing.

32.6 ***Concession Requirements***

32.6.1 In some instances, due to special constraints etc. there may be need to remove the incline Passenger Emergency Stop Switches. In this case a concession will be sought.

32.6.2 The minimum requirement is in accordance with BS EN 115-1: 2017 Section 5.12.3.8 pg 65 [1, p. 65].

33. Machine Side Manually Operated Stop Devices

33.1 **General Requirements**

33.1.1 Emergency stop switches shall function as category 0 in accordance with BS EN ISO 13850:2015 [30]

33.1.2 Emergency stop pushbuttons shall be fitted at the following locations:

- Controller cabinet door
- Upper landing truss
- Lower landing truss

33.2 **Legacy / Machine Room and Incline Access.**

33.2.1 Stop devices shall be positioned at the following locations:

Rise	No. of devices on the incline
Less than 10m	1 (On the access stair side)
From 10m but less than 12.5m	1 (On the access stair side)
From 12.5m but less than 18m	2 (On the access stair side)
From 18m but less than 24m	3 (On the access stair side)
From 24m but less than 30m	4 (On the access stair side)

Table 11: Position of Incline Stop device(s)

33.2.2 Ensure that position of the stop switches on opposite machines are staggered and do not protrude into the access stairway.

33.3 **Compact Machines (Machine room Less Equipment)**

33.3.1 Stop devices shall be positioned at the following locations:

- Controller cabinet door (if physical constraints allow)
- Upper landing driving station
- Lower landing driving station

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34. Incoming Power Supply Isolation

34.1 **Isolators System General Requirements**

34.1.1 A fused isolator assembly, shall provide independent, safe means of isolation of the escalator electrical system, without interrupting the power to any other escalator.

The key type and the precise location of the assembly shall be agreed with the *Employer*.

34.1.2 The mechanical locking off system shall facilitate addition of padlocks.

34.2 **Isolator Electrical Specification**

34.2.1 Isolators shall be rated for on-load switching to BS EN 60947-3:2009+A2:2015: Chapter 4, Characteristics Pg15 [31, p. 15].

34.2.2 The handle of the isolator shall provide a mechanical, visual 'on' and 'off' indication.

34.2.3 If isolator auxiliary contacts are provided, they shall be interlocked such that disconnection of the main contacts cannot be carried out without first disconnecting the auxiliary contacts.

34.3 **Isolator Positioning and Numbering**

34.3.1 For a flight of escalators, isolators shall be co-located and numbered from left to right in ascending numeric order and correspond to the escalator number(s) as detailed in the site-specific documentation.

34.4 **Isolator Duty Cycle**

34.4.1 The normal duty cycle of the isolator shall comply with BS EN 60947-3:2009+A2:2015, Section 7.2.4.2, Table 4, pg 23 [32, p. 23]

34.5 **Isolator Standard Operation**

34.5.1 The control system shall be designed to facilitate the LU standard escalator isolation procedures, without any requirements for additional controller actions to restore full functionality. The standard procedures are as described in clauses 34.5.2 below and 34.5.3 below.

34.5.2 The standard escalator energisation (start up) procedure is as follows:

- a) Remove primary padlock [as per safe isolation of plant and equipment requirements]
- b) Switch on the isolator
- c) Switch on the circuit breaker
- d) Start the escalator

34.5.3 The standard escalator isolation procedure is as follows:

- a) Stop the escalator;
- b) Switch off the circuit breaker;
- c) Switch off the isolator;
- d) Add primary padlock [as per safe isolation of plant and equipment requirements].

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35. Drive and Control System

35.1 **Drive Selection Criteria**

35.1.1 The drive motor and control system shall be of sufficient power kW rating to meet the maximum efficiency required to achieve the duty cycle.

35.2 **VVVF Drive System**

35.2.1 The control system shall be fitted with a fully rated VVVF drive system.

35.2.2 The VVVF drive shall provide, if required harmonic filtration in order to limit the harmonics drawn from the supply. See Section 26 above.

35.2.3 The VVVF drive system shall make provision for the use of an automatic regeneration system. The contractor shall install the system where it is appropriate and following a contractual agreement with the *Employer*.

35.2.4 The drive system shall be configured to limit the full load starting current to no more than twice the full load running current. The VVVF drive controller shall satisfy the following requirements:

Current limit for acceleration and roll back load limit up to at least 120% Design Loading

- a) Reconnect facility, for short term or transient under-voltage ride-through spinning load (to synchronise the supply phase with the motor voltage when the motor is regenerating)
- b) Programmable acceleration and deceleration characteristics and current or torque limits
- c) Frequency skip setting, to prevent the inverter driving the motor at a speed equal to its natural frequency
- d) Self-protecting for output terminal short circuit
- e) Self protecting and alarm output for any internal fault
- f) Life rating for the power capacitors in the D.C. link (minimum 87,600 hours)
- g) Integral key pad and clearly legible display
- h) Comprehensive alarm and fault self diagnostics

35.3 **Weight Test Loading Requirements**

35.3.1 The testing of the escalator post installation shall comply with the requirement to verify the stopping distance under brake load as per BS EN 115-1: 2017, Section 7.3 pg 73 & 74 [1, pp. 73, 74].

35.3.2 The contractor will provide evidence of compliance of brake compliance as per BS EN 115-1: 2017, Section 7.3 pg 73 & 74 [1, pp. 73, 74].

If the weight testing provision is to be waived the contractor is to supply evidence that the design has been tested and verified by other means, including assurance and testing methodology.

See Table 14: Assurance / Review Documentation

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36. Drive Motors

36.1 **Noise and Vibration Design**

36.1.1 Each motor shall conform to quality Grade B (Special) for vibration as defined in BS EN 60034-14 [33].

36.1.2 The *Contractor* shall design and install to prevent earth leakage through the bearings.

36.2 **Design Requirements - General**

36.2.1 The *Contractor* shall provide torque/speed and current/speed curves for the motor, as part of the design submission.

See Table 14: Assurance / Review Documentation

36.3 **Electrical Design**

36.3.1 A thermistor shall be provided in each motor winding, to protect against overload or a similar system that will protect the motor from thermal load damage.

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37. Braking System (electrical)

37.1 **General Requirements**

37.2 **The braking system shall comply with BS EN 115-1: 2017 Brake Design**

37.2.1 The braking design shall be as defined in Section 37 above

37.3 **Safety Circuit Activation**

37.3.1 An underspeed [80% of running speed] shall operate the braking system and bring the escalator to a stop.

37.3.2 .

37.4 **Auxiliary Brake Adjustment**

37.5 **Brake Safety Circuit**

37.5.1 For all modes of operation, if confirmation of lifting of the braking system is not received within 3 seconds, the start shall be aborted.

37.6 **Maintenance Brake Testing Provision**

37.6.1 A means shall be provided to enable the effectiveness of the brake system to be tested under normal stopping conditions and foreseeable failure modes (i.e. independent activation of operational brake and auxiliary brake).

37.6.2 A brake lift mechanism, button press, is provided for at the controller door or by operational interface to facilitate ease of testing.

37.7 **Inverter Braking**

37.7.1 Where inverter braking is employed, the *Contractor* shall provide a certification of compliance in accordance with BS EN 115-1: 2017 Section 5.12.3.5.2.2 pg 64 [1, p. 64].

37.7.2 The Invertor Brake shall bring the escalator to an electrical stop. The Electrical Drive shall be held until the Operational and Auxiliary brakes are applied, then the power removed to ensure no rollback will occur.

37.7.3 Upon full stop both the Operational and Auxiliary brakes will be applied [fail safe] until the escalator is activated as per normal operation or maintainer testing / adjustment is required.

See Table 14: Assurance / Review Documentation

37.7.4 Where back-up safety devices [watchdog timers etc.] designed to apply the mechanical brakes, after a pre-defined period of time, they shall be in accordance with BS EN 115-1: 2017 Section 5.12.3.5.2.2 pg 64 [1, p. 64].

37.7.5 The rate of sampling to determine the deceleration shall be a minimum of 10 samples per second.

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38. Stand-by Operation (Economy Power Mode)

38.1 **General Requirements**

38.1.1 The escalator control system shall provide the facility for 'stand-by operation' for slow speed operation during periods of intermittent passenger usage.

38.2 **Stand by Operational Design**

38.2.1 The escalator shall detect the entering of a passenger.

38.2.2 Once passenger activity has been detected, the escalator shall accelerate [0.5ms^{-2}] to its normal speed.

38.2.3 The escalator shall decelerate automatically to 0.35ms^{-1} , for stand-by operation, following no detection of passenger movement onto the escalator for an adjustable period ensuring all passengers have disembarked [as per escalator journey times].

38.2.4 Acceleration and deceleration shall be at an acceptable rate of less than 0.5ms^{-2} to achieve a smooth transition.

The parameter settings and method of detection of users shall be agreed with the Employer.

38.2.5 A facility to over-ride stand-by operation shall be incorporated within the control system. Detailed design and password requirements shall be agreed at the design stage.

39. Maintenance Speed (Inching)

39.1 **Handheld Design**

- 39.1.1 The *Contractor* shall demonstrate that the portable handheld inching control device supplied is fully and safely compatible with or the LUL Standard Portable Handheld Inching Pendant.
- 39.1.2 The LUL standard portable handheld inching control device connects, via a plug, to a 10 pin socket with plug/socket pin number allocation as described in
- 39.1.3 Table 12.

Pin number	Device
1	Stop pushbutton connection
2	Stop pushbutton connection
3	Link to pin 4
4	Link to pin 3
5	Ready indicator connection
6	Ready indicator connection
7	Feed to 'Inch' (common/run) pushbutton
8	'Up' signal from 'Up' pushbutton
9	'Down' signal from 'Down' pushbutton

Table 12: Inching Device Pin Number Allocation Summary

- 39.1.4 This needs to be in accordance with BS EN 115-1, Section 5.12.3.13, pg 67. [1, p. 67]

39.2 **Handheld Identification**

- 39.2.1 The labelling text shall be Arial 10mm high (minimum).
- 39.2.2 The inching control device shall be permanently marked to identify the station & escalator No#.

39.3 **Inching Sockets Locations**

- 39.3.1 The approximate locations for required inching sockets are given below:
The precise location of the inching sockets shall be agreed with the *Employer*, at the design stage:
- Controller cabinet door
 - Within the newel end at the upper landing. (See Clause 20.9 above)
 - Within the newel end at the lower landing. (See Clause 20.9 above)
- 39.3.2 Within the machine room at the transition between the incline and upper landing, on one, common side.
- 39.3.3 Within the machine room at the transition between the incline and lower landing, on one, common side.

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39.4 ***Incline Accessible Truss***

39.4.1 Inching sockets shall be positioned at the following locations on the incline:

Rise	No. of devices on the incline
Less than 10m	1 (On the access stair side)
From 10m but less than 12.5m	1 (On the access stair side)
From 12.5m but less than 18m	2 (On the access stair side)
From 18m but less than 24m	3 (On the access stair side)
From 24m but less than 30m	4 (On the access stair side)

Table 13: Position of Incline Stop device(s)

39.4.2 Inching socket assemblies mounted on the truss shall each be fitted with a latching emergency stop pushbutton (twist to release).

39.4.3 The assemblies described shall be fitted such that they do not protrude beyond the envelope of the escalator truss, to prevent accidental stoppage.

39.5 ***Inching Operation***

39.5.1 With the control selector switch in the 'inch' position, it shall be possible to run the escalator at inching speed by the use of a handheld inching control device. It shall not be possible to start the escalator at normal speed when 'inch' mode is selected.

39.5.2 The escalator shall only operate in 'inch' mode, when the 'inch' pushbutton as well as either the 'up' or the 'down' pushbutton, (on the handheld inching control device), are pressed. If the 'up' and 'down' pushbuttons are pressed simultaneously, the escalator shall remain inoperative, i.e. they shall be electrically interlocked. Upon release of any of the pushbuttons the brakes shall apply.

39.5.3 The start sequence shall only commence following activation of the 'inch' pushbutton and either the 'up' or 'down' pushbutton. Upon reset of a safety device, the control system shall not have already commenced the start sequence.

39.5.4 Removal of a dummy plug shall interrupt the safety line to stop or prevent starting the escalator and display an appropriate message on the controller screen.

39.5.5 Removal of another dummy plug, or further unit plugged in, shall display an appropriate message on the controller screen e.g. 'Check inch pendants'.

39.5.6 With a handheld pendant plugged in, it shall not be possible to start the escalator in 'normal' or 'test' mode.

39.5.7 Selection of 'normal' or 'test', with an inching device plugged in shall inhibit a start command and display an appropriate message on the controller screen e.g. 'Check inch pendants'.

39.5.8 Maintenance (inching) speed shall be, activated automatically when an 'engineers' hand held controller is 'plugged-in'.

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40. Lubrication Monitoring

40.1 *General Requirements*

40.1.1 A monitoring requirement is to be provided to and from the controller as per section 40.3 below.

40.2 *Lubricator Power Requirements*

40.2.1 The lubricator shall be a maximum operating voltage rating, 230V.

40.3 *Lubricator Safety Features*

40.3.1 The lubricator shall be prevented from running while the escalator is stationary.

40.3.2 The lubricator power supply shall be monitored by the controller.

If there is no power to the lubricator during the operational running a fault will be recorded and the Escalator will not restart until the power supply is restored. .

This failure will not cause the escalator to stop just not restart without the power supply being restored.

40.3.3 Timer settings shall be adjustable within pre-set limits to satisfy the lubrication requirements of the escalator.

The rationale for the design of the lubrication system, in particular the settings, shall be justified by the Contractor at the design stage.

See Section 15 above on page 20.

See Section 44.8 below on page 60.

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41. Standard Electrical Equipment

41.1 *Electrical Equipment Cabinets*

- 41.1.1 Electrical equipment cabinets shall be metallic.
- 41.1.2 All electrical equipment cabinets shall be sized to suit actual requirements (i.e. not oversized) ¹².
- 41.1.3 Cabinet sides and base shall be rigid (not prone to flexing).
- 41.1.4 Door(s) shall be rigid and shall not be easily removable from their hinges.
- 41.1.5 Door(s) shall be locked by use of tool-operated, 8mm triangular lock or locks (EMKA type or equivalent). A key locking system is not acceptable.
- 41.1.6 The location of electrical equipment cabinets shall allow easy access, shall not cause any obstruction to other equipment and shall be maintainable.

41.2 *Electrical Cooling and Performance*

- 41.2.1 The air temperature rise inside cabinets, when operating, shall not exceed the ambient by more than the limits stated in BS EN 61439-1: 2011, 9.2 Temperature rise limits, pg 52 [34, p. 52].
- 41.2.2 Electrical equipment cabinet(s) shall be designed to minimise the detrimental effects of high heat output components on reliability and component service life ¹³.
The environment conditions shall necessitate the IP rating and protection as per Section 27 above.

¹² Site-specific spatial constraints may dictate that a generic design is inappropriate.

¹³ Design and maintenance requirements for electrical equipment cabinet(s) construction, component layout and ventilation are key to maximising reliability and service life.

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42. Safety Notices and Identification Labelling

42.1.1 Every item of equipment shall be fitted with an identification label, in accordance with the relevant label drawing or list.

42.2 **Label Material**

42.2.1 Notices and identification labels shall be made from either aluminium or plastic laminate e.g. 'Traffolyte' or equivalent and engraved.

42.3 **Label Location**

42.3.1 The manufacturer's nameplate shall be fixed on the outside of each control system cabinet, detailing the information as defined in BS EN 60947-1, Section 5.1 Nature of information, pg 54 [35, p. 54] and BS EN 61439-1:2011 Section 6.1 ASSEMBLY designation marking pg 32 [34, p. 32] and other additional relevant items, including the following:

- a) Manufacturer's name or logo;
- b) Type designation;
- c) A serial number, traceable to the purchase or contract order number;
- d) Date of manufacture;
- e) Total assembly weight in kg.

42.4 **Label Standardisation**

42.4.1 The following electrical equipment notices/labels are detailed for standardisation purposes:

- **"ISOLATOR"**
 - 7mm high, with "No XXX".
 - Labels shall be positioned on the front of the main power isolator.
 - Text font shall be Arial 40mm, black;
- **"DRIVE"**
 - 7mm high, with "No XXX".
 - Labels shall be positioned on the front of the drive cabinet.
 - Text font shall be Arial 40mm, black;
- **"CONTROLLER"**
 - 7mm high, with "No XXX".
 - Labels shall be positioned on the front of the controller.
 - Text font shall be Arial 40mm, black;
- **"Immobilisation or isolation"**
 - To LUL drawing number 384-945 on the main power supply isolator.
 - Text font shall be Arial 10mm, black;
 - Mandatory notice, blue background, with white lettering:
- **"Inform Station Supervisor if escalator immobilisation / isolation required".**
 - Nominal size of label: 150mmx100mm.
 - Text font shall be Arial 10mm, black;
- **"Danger High Voltage"**
 - Text font shall be Arial 10mm, black
- **"Isolate before opening the door"**
 - Text font shall be Arial 10mm, black;
- **Warning label, "Danger"**
 - Text font shall be Arial 6mm, black
- **Warning label, "live"**
 - Text font shall be Arial 4.5mm, black

42.4.2 Identification labels for all pushbuttons, switches, components, indicators, terminals and control panel:

Text font shall be Arial 4mm high, black.

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42.5 ***Label Fixing***

- 42.5.1 All labels shall be durably fixed mechanically or a suitable adhesive that has a permanent bond for the lifetime duration rating of the equipment.
- 42.5.2 Within all electrical equipment cabinets, the cores of all cables and terminals shall be identified by markings, which shall correspond to the schematic wiring diagram.
- 42.5.3 Every item of operational equipment shall be clearly labelled at all times, including during installation.

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43. Field Wiring

43.1 **General Requirements**

43.1.1 The whole of the installation shall be undertaken in accordance with BS EN 7671 Chapter 52, section 521.6, pg 126 [29]. Trunking and Tray requirement see section 43.5 below

43.1.2 Good EMC practices BS EN 7671 Chapter 52, section 528, pg 137 [29].

43.2 **Assurance Requirements**

43.2.1 It shall be certificated in accordance with BS EN 7671 Chapter 63, section 631, pg 204 [29].

43.3 **Cable Requirements**

43.3.1 Any cables greater than or equal to 400V installed on flat cable tray shall be armoured or braided to provide adequate mechanical protection.

43.3.2 Any other cable less than 400v installed on flat cable tray do not need to be armoured.

43.3.3 If a cable is located within trunking it does not need to be armoured.

43.3.4 Care needs to be taken if there are potential hazards that the cable run is risk assessed to define physical protection requirements¹⁴.

43.4 **EMC Compliance**

43.4.1 The field wiring forms part of the escalator control system, therefore, the type of field wiring installed shall comply with the requirements of the *Contractor's* EMC certification for the control system. See Section 43.4.

43.5 **Installation of Cable Containment**

43.5.1 All cables shall be mounted on Tray / Trunking within the asset envelope.

43.5.2 Where cable tray/trunking attach directly to structural surfaces, stand-off brackets shall be used to give a minimum clearance of 40mm.

43.5.3 Fixings shall support the full width of cable tray / trunking.

43.5.4 Cable tray shall only be cut along a line of plain metal, i.e. not through the perforations. All cut edges shall be filed smooth, prepared and treated with a zinc rich paint.

43.5.5 Where it is necessary to cut holes in the tray for the passage of cables, these holes shall be bushed.

43.5.6 Adjacent sections of cable tray shall not have gaps larger than 5mm between them.

43.5.7 Flexible conduit lengths shall not exceed 1m.

43.6 **Design of Cable Containment**

43.6.1 All cable tray/trunking shall be designed to have 20% minimum spare capacity for future cables.

43.6.2 Trunking and tray shall be in accordance with BS EN 61537:2007 [36].

43.6.3 Steel Tray type IEC 1855/06 pg 53 Annex A.

43.6.3.1 Minimum Protection to Class 3, Table 1 pg 12. [Pre Fabricated zinc galvanised].

43.6.3.2 Minimum thicknesses of cable trays shall be to Medium Duty:

- 50mm to 100mm wide; 0.7mm
- 150mm to 225mm wide; 0.8mm
- 300mm wide; 1mm
- 450mm to 600mm wide; 1.2mm
- 750mm to 900mm wide; 1.4mm

¹⁴ Maintenance operations that could impact, damage or cause injury during any planned works.

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43.7 **Cable Identification**

- 43.7.1 All cables shall be fitted with individual identification labels at both ends.
Each label shall state escalator number and route designation.
For example an escalator number 1, cable designated N shall read '1-N'.

43.8 **Cabling Sub Surface Station Requirement**

- 43.8.1 If the station / installation / asset have been deemed to be compliant with the Fire Precautions (Sub-Surface Railway Stations) Regulations then it needs to comply with all sections of these regulations.

43.9 **Sub Surface Cable Materials**

- 43.9.1 The current standard for cables will need to comply with the LU standard S1085 [37].
The contractor shall provide assurance that the cable and associated materials comply with Section 43.8.1.

See Table 14: Assurance / Review Documentation

43.10 **Cabling for Surface Stations Requirements**

- 43.10.1 If the station / installation / asset has been deemed a surface station local regulations will apply.

43.11 **Surface Cable Materials**

- 43.11.1 Cables will need to comply with the Low Smoke Zero Halogen BS 7671 [29]
CPR class and equivalence: Class Eca is an exact equivalent to the requirement of BS EN 60332-1-2 [38]
NB Minimum requirement for any application within buildings and construction works.

43.12 **Cable Ties**

- 43.12.1 Plastic Cable ties can be used if they conform to with Section 43.8.1 requirements otherwise galvanised straps or stainless steel ties shall be used for retaining cables.
43.12.2 Galvanised straps or stainless steel ties will be used in overhead areas [deemed "escape routes"] as per BS EN 7671, Chapter 52, section 521.11.201 [29].

43.13 **Cable Housekeeping**

- 43.13.1 All unused cores within multicore cables shall be connected to earth at each end and labelled to identify as 'spare'.
43.13.2 No tee or other joint shall be permitted without the permission of the *Employer*, in writing.
43.13.3 Cable support will be as per BS EN 61537:2007 [36].

43.14 **Cable Interchangeability**

- 43.14.1 Plug and socket connections are permitted but it must not be possible to cross connect adjacent devices or adjacent escalators.
When adjacent escalators have newel box control panels side by side - plugs must not be interchangeable.

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44. Inspection

44.1 **General Requirements**

- 44.1.1 The inspections and tests described in clause 44.2.1 below shall be undertaken in the factory. Where it is necessary to break the escalator down to facilitate delivery, the effected inspections and tests described in clause 44.2.1 below shall be repeated on site.
- 44.1.2 Sample (pro forma) test sheets shall be submitted for acceptance by the Employer. The Employer will advise the Contractor of any further tests which are required to be captured on the test and inspection sheets.
- 44.1.3 Completed test and inspection records shall be available to the *Employer* at the time.

See Table 14: Assurance / Review Documentation

44.2 **Test Sheets**

- 44.2.1 The Contractor shall undertake the following inspections and tests during the construction phase, which shall be captured on the test and inspection sheets. These shall cover, but not be limited to:
- a) Datum marking
 - b) Installation and alignment of tension carriage;
 - c) Installation and alignment of main drive shaft
 - d) Alignment of tracks;
 - e) Installation and alignment of drive unit;
 - f) Installation and alignment of handrail drive chains and sprockets;
 - g) Installation and alignment of skirting brackets and brush guard;
 - h) Installation and alignment of newel wheels;
 - i) Installation and alignment of skirting panels;
 - j) Installation of step chain and steps;
 - k) Alignment of handrail tracks;
 - l) Installation of balustrade panels;
 - m) Installation of comb plates and floors covers;
 - n) Installation of lubrication system;
 - o) Installation of controller;
 - p) Installation of remote monitoring (if applicable);
 - q) Installation of switches and safety devices;
 - r) Installation of cable containment;
 - s) Installation of wiring;
 - t) Running clearances/4 Step Gap

- 44.2.2 Where controlled jigs are utilised for the build, the contractor shall provide the method of installation for review.

The contractor can demonstrate at this point the standard inspection schedule for this type of installation. This may remove or rationalise some of the individual inspections and tests in clause 44.2.1 above of this specification. Jig calibration certificates shall be provided.

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44.3 **Installation of Truss**

44.3.1 Following the delivery and installation of the truss on site, it shall be signed off as lined and levelled to given datum's.

44.4 **Field Wiring**

44.4.1 Prior to running the escalator, all field connections shall be checked against the relevant wiring diagram.

44.4.2 Testing, inspection and certification shall be in accordance with the requirements of BS 7671, by an NICEIC or equivalent certified *Contractor*.

44.5 **Equipotential Bonding**

44.5.1 The equipotential bonding shall be proved by measuring the resistance between adjacent bonded items. The measured reading shall be below 0.5Ω in each case.

44.6 **Control and Emergency Devices**

44.6.1 All control and emergency devices (including speed monitoring devices) shall be operated and checked for correct operation. The outcome shall be recorded on inspection and test sheets.¹⁵

44.7 **Four-Step Gap**

44.7.1 A four-step gap is to be provided and the following clearances or dimensions shall be checked and recorded to ensure conformity with the specification and contract drawings.

- a) Step to skirting;
- b) Load relieving ramps with chain wheel clearance;
- c) Step to guide roller at comb;
- d) Comb to tread cleat;
- e) Step to step (on upper landing);
- f) Brush guard to step (on landings and on incline);
- g) Tension carriage half-track gap;
- h) Carriage spring setting;
- i) Carriage scale plate reading;
- j) D-track to trailer wheel clearances;
- k) Chain and trailer wheels to upthrust track;
- l) Upthrust lug of step to upthrust track;
- m) Sagged step support ramp to step;
- n) Sagged step detector to step;
- o) Missing step detector to step;
- p) Handrail to balustrade mouldings;
- q) Step/step chain guard clearances.

¹⁵ It is permissible for the tripping of electronic speed detection devices to be artificially induced, to prove their functionality.

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44.8 **Lubrication**

44.8.1 The automatic lubricator shall be checked to ensure that all remote feeds are operating correctly, and that lubricant is being applied in appropriate quantities.

44.8.2 All manual lubrication points shall be checked and lubricated as necessary.

See Section 15 above on page 20.

See Section 40 above on 52.

44.9 **Brake Testing and Setting**

44.9.1 The requirement to comply with the weight testing provision sited as per BS EN 115-1: 2017, Section 7.3 pg 73 & 74 [1, pp. 73, 74].

See Section 35.3 above on page 46

44.10 **Non Dynamic Running Test**

44.10.1 The escalator shall be run for 12 hours without stopping except to change direction (6 hours in each direction) with the following readings being recorded hourly on the test sheets:

- a) Ambient temperature (in the machine room);
- b) Motor temperature (on casing);
- c) Gear box vibrations;
- d) Reduction gear box temperatures (on casing, adjacent to input and output shafts);
- e) Power supply voltage;
- f) Running current;
- g) Motor speed(s).

44.10.2 After 6hr and 12hr periods, a check on step-to-step and step-to-skirt clearances shall be carried out, and the results recorded.

44.11 **Statutory Passenger Safety Inspection of Escalator**

44.11.1 Following satisfactory completion of testing, the *Employer* will carry out a "Passenger Safety Inspection" of the Escalator and complete a Form PM45 certificate.

44.11.2 The *Contractor* shall have personnel in attendance during Statutory "Passenger Safety Inspections".

See Table 14: Assurance / Review Documentation

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45. Preparation for Entry Into Service

45.1 **Immediate Entry Into Service**

- 45.1.1 When the escalator is to enter into service immediately following completion, all necessary work to prepare the escalator for entry into passenger service shall be carried out. This shall include:
- Removal of any temporary protective material;
 - Thorough cleaning of the escalator;
 - Replacement of any parts that are identified as being damaged.

45.2 **Maintenance Between Completion and Delayed Entry Into Service**

- 45.2.1 When the escalator is not required for service immediately following completion, servicing and occasional running of the escalator shall be performed, to ensure that it remains in a satisfactory condition.
- The escalator shall be thoroughly inspected for any obstructions, prior to each period of running. The frequency and duration of such operation shall be agreed with the *Employer*.
- 45.2.2 During this period, suitable temporary protection shall be provided to ensure that the escalator balustrade, decking, panelling and steps remain clean and undamaged.
- 45.2.3 All necessary work to prepare the escalator for entry into passenger service shall be carried out. This shall include:
- Removal of any temporary protective material;
 - Thorough cleaning of the escalator;
 - A lubrication check;
 - A functional check of all safety devices;
 - A check to ensure all signs and passenger notices are in place;
 - Replacement of any parts that are identified as being damaged.

46. Review Documentation

To be provided following contract award	To be provided prior to manufacture	To be provided prior to commissioning	To be Provided after commissioning
Survey reports, including details of loadings applied to the truss support structure;	A design risk assessment for the complete escalator.	Declaration of Conformity Certificate to EN115-1:2017 and this specification	Final operation and maintenance manual
CDS for escalator truss	Parts lists and manufacturing drawings for the escalator components, controller electrical circuit diagrams, field wiring diagrams, and earthing drawings.	A full size printed and laminated copy of the wiring schematic and component layout for the control system, to be kept on site.	Asset Data form (MR-F-31260)
Reliability and availability supporting evidence	A site-specific layout drawing of escalator; Including a plan of the equipment in the machine room (if applicable), including interfaces with adjacent infrastructure, detailing critical dimensions.	A copy of the draft operation and maintenance manual.	As-built drawings and list
An EMC control plan and installation policy, including an EMC HAZID survey report;	Project specific calculations for the selection of motors, gearboxes, chains & brakes.	Completed Factory and site installation test sheets.	
Schedule of combustible materials, including volume and data sheets.	FMEA studies, as appropriate	Ride quality results	
Quality Plan	<u>Generic Type Tests</u> Step report to confirm EN115 and Appendix H requirements are met. Step chain report. Floor & Comb Plate report. Handrail report.	Vendor quality information including certificate and conformance and other information. See Table xx	
	Designer's check certificates	EMC Technical File	

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	Documentary evidence demonstrating Notified Body assessment of safety critical software, safety critical devices, communication interface and any associated software change control;		
	Simulation test and inspection sheets, showing simulation test requirements of the electrical system against for factory testing		
	Factory and site inspection and test plans for mechanical installation.		
	EMC test report, including evidence to demonstrate compliance with the design requirements for harmonics immunity;		

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47. Vendor Quality Information

Mechanical	Truss Assurance	Section 8.2, pg. 14
	Track Assurance	Section 9.2, pg. 15
	Step Assurance	Section 10.2, pg. 16
	Wheel Assurance	Section 11.2, pg. 16
	Step Chain Assurance	Section 14.3, pg. 19
	Lubricator	Section 15.3, pg. 20
	Handrail	Section 16.4, pg. 21
	Auxiliary Chain	Section 16.7, pg. 21
	Brake Assembly	Section 18.9, pg. 24
	Drive Unit	Section 19.2, pg. 25
	Balustrade	Section 20.3, pg. 26
	Skirt	Section 20.6, pg. 26
	Brush Guard	Section 20.8, pg. 27
		Section 25, pg. 32
Power Supply	Harmonics	Section 26.3, pg. 33 Section 26.4, pg. 33
Controller	EMC	Section 28.2.2, pg.35
	Sil Rating	Section 28.3.1, pg. 35
	Software	Section 28.7.1, pg.36
	Comms	Section 29.1.2, pg. 39
	Safety Circuit	Section 30.2, pg.40
	Safety Circuit Testing	Section 30.2.2, pg. 40
	Operational Switches	Section 31, pg. 41
	Weight Testing	Section 35.3, pg.46
	Driver Motor	Section 36.2.1, pg. 47
	Invertor Brake	Section 37.7.1, pg.48
Installation	Cable Material	Section 43.9.1, pg. 57

Table 15: Vendor Quality Information

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48. Records

48.1 **Delivery Media Format**

48.1.1 Electronic data shall be in Adobe PDF format.

48.2 **Asset Data**

48.2.1 London Underground's escalator data entry form (MR-F-31260), shall be completed and submitted in both electronic and signed hard copy formats.

48.3 **As-Built Drawings and Parts Lists**

48.3.1 A schedule of all drawings and parts lists used in the manufacture and installation of the escalator shall be provided, in electronic format. The schedule shall include, as a minimum, the following information:

- a) Drawing/parts list number;
- b) Revision status and date;
- c) Title;
- d) Originator (company name).

48.3.2 A complete set as-built of drawings of the escalator, including general arrangements, assemblies, sub-assemblies, component details, site installation plans and electrical diagrams, shall be provided in electronic format.

48.4 **Declaration of Conformity Certificates**

48.4.1 Certificate(s) of Declaration of Conformity stating that the completed installation is in compliance with:

- a) The Low Voltage Directive 2006/95/EC;
- b) Safety of Machinery Directive 2006/42/EC;
- c) EMC Directive 2004/108/EC, BS EN12015 and BS EN 12016;
- d) Statutory Instrument 2006/3418.

48.5 **Operation and Maintenance Manual**

48.5.1 The manual shall be of a comprehensive 'Field Service' type, and shall contain sufficient information for the escalator to be operated, maintained, overhauled and repaired using fault finding techniques.

48.5.2 The following particular items shall be included, as a minimum:

- a) Table of contents;
- b) General description of the escalator;
- c) Operating instructions including applicable safety procedures;
- d) Instructions for the replacement of all serviceable component parts of the escalator;
- e) Details of all routine adjustment or settings;
- f) Procedure for periodic testing of the mechanical brakes, including the curve characteristics of springs and solenoids;
- g) Procedure for periodical testing of safety devices;
- h) Completed escalator data entry form;
- i) Bearing schedule;
- j) Recommended lubricants;
- k) Recommended servicing intervals;

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- l) Recommended NDE requirements including frequencies;
- m) Recommended electrical inspection and testing requirements for 3 yearly periodic inspections;
- n) Service parts list and recommended spares holding;
- o) EMC maintenance requirements;
- p) Assembly drawings and electrical circuit diagrams;
- q) Controller software programme file names;
- r) Manufacturers' product information sheets for any bought-out items;
- s) Cleaning procedures;
- t) Details of any modifications made during the installation and testing periods.

48.5.3 The *Contractor* shall provide any revisions to the maintenance manual, which may arise during the defects liability period.

48.6 ***Training***

48.6.1 The *Contractor* shall provide an on-site training course, in the safe use and operation of the escalator, to 5 nominated staff members.

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49. Document History

Revision	Date	Notes
A1	November	Draft
A2	December	Draft
A3	December	Draft for Comment
01	January	First Issue

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Appendix A Abbreviations

The following abbreviations are used in this specification:

AFNOR	Association Francaise De Normalisation
ALARP	As Low As Reasonably Practicable
CCTV	Closed Circuit TeleVision
CDS	Conceptual Design Statement
CE	Committée Européene
CEN	European Committee for Standardisation
C of C	Certificate of Conformity
COSHH	Control of Substances Hazardous to Health
CRL	Crossrail Limited
DIN	Deutsche Industrie fur Normung
DPE	Dye Penetrant Examination
EEPROM	Electrically Erasable Programmable Read Only Memory
EMC	Electromagnetic Compatibility
EPC	Electronic Product Code
EPROM	Erasable Programmable Read Only Memory
EWL	Erection Working Line
EWP	Erection Working Point
FEA	Finite Element Analysis
FFT	Fast Fourier Transform (spectral analysis)
FLT	Full Load Torque
FMEA	Failure Mode and Effects Analysis
HSE	Health and Safety Executive
IDLH	Immediately Dangerous to Life or Health
IEC	International Electrotechnical Commission
IP	Ingress Protection
IRHD	International Rubber Hardness Degree
ISO	International Standards Organisation
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LOI	Limiting Oxygen Index
LSZH	Low Smoke Zero Halogen
LUL	London Underground Limited
ORR	Office of Rail Regulation
MPI	Magnetic Particle Inspection
MSPL	Mean Sound Pressure Level
MTBF	Mean Time Between Failures
MTTR	Mean Time To Repair

NDE	Non Destructive Examination
NICEIC	National Inspection Council for Electrical Installation Contractors
PESS	Programmable Electronic Safety Systems
PESSRAE	Programmable Electronic Safety Systems in Safety Related Applications - Escalators
PLC	Programmable Logic Controller
PWHT	Post Welding Heat Treatment
QA	Quality Assurance
QC	Quality Control
RAMS	Reliability Availability, Maintainability and Safety
RCD	Residual Current Device
RFID	Radio Frequency Identification
RMS	Root Mean Square
RPM	Revolutions Per Minute
SCADA	Supervisory Control And Data Acquisition
SI	Système Internationale
SIL	Safety Integrity Level
SOR	Station Operations Room
SRV	Slip Resistance Value
TEFC	Totally Enclosed Fan Cooled
TDMA	Time Division Multiple Access
TfL	Transport for London
TI	Flammability Temperature Index
UHF	Ultra High Frequency
UKAS	United Kingdom Accreditation Service
UT	Ultrasonic Testing
VVVF	Variable Voltage, Variable Frequency

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Appendix B Definitions

The following terms are used in this specification:

Castell lock - A proprietary, key-operated, mechanical interlock, with a unique, embossed number, that ensures that, the power cannot be turned on to the escalator, when the key is removed.

Castell key - The proprietary key, with a unique, recessed number, that operates a Castell lock.

Comb line - The intersection of the comb surface with the step tread surface.

Concession - The Concession process is the means by which the *Employer* controls the installation of materials, components or equipment that do not comply with the requirements of this specification.

Controller - The electrical and electronic systems that control and monitor the escalator, housed in one or more of the cabinets, including the cabinets themselves and all items mounted externally on them.

Duty cycle – A specified varying load pattern over a defined period.

Duty rating – The load per exposed step.

Engineering Hours – “Engineering Hours” means in relation to Stations, the period of time scheduled for the relevant Station to be closed on the relevant day in accordance with the Station Times Book each day of the week.

Erection working line (EWL) - A straight line connecting the upper and lower erection working points.

Erection working point (EWP) - The intersection of the finished floor level, the inclined erection working line (EWL), as defined by the *Contractor*, and the centre line of the escalator, at each landing.

Extensive / grouped materials - Where the mass and separation exceed the definition of limited/dispersed materials.

Fail safe - Used to describe any item of equipment that will default to a safe condition in the event of failure.

Field bus system – Industrial communication system that uses a range of media such as copper cables, fibre optics or wireless, with bit serial transmission for coupling distributed field devices (sensors, actuators, drivers, transducers, etc.) to a central control or management system.

Field wiring - All wiring relating to the escalator, that is external to the escalator controller.

Flight of escalators - A bank of two or more adjacent escalators sharing a common space.

Gear train - One or more reduction gearboxes, used to reduce the rotational speed of the motor(s).

Inching - Operation of the escalator at reduced speed under maintenance control.

Inching speed - The reduced speed at which the escalator runs when under maintenance control.

International standard – ISO (International Organization for Standardization) standard or CEN (European Committee for Standardization) standard;

Light slip test - A test carried out on an escalator to check that an unloaded machine stops within the specified stopping distances, for both the up and the down directions of travel.

Limited / dispersed materials - Where the mass is greater than 100g and less than 500g, and where there is a separation of not less than 0.5m between materials.

Load relieving ramp - (also known as unloading ramp or load discharge ramp) - A curved ramp made of a low-friction material, that supports the step chain at the upper curve of the escalator, such that the chain wheel loading is reduced.

Minor use materials - Where total mass and surface area do not exceed 100g or 0.2sqm respectively, regardless of separation between materials.

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Normal speed - the speed at which the escalator runs when carrying passengers.

Programmable electronic system in safety related applications for escalators and moving walks/lifts (PESSRAE) - System for control, protection or monitoring based on one or more programmable electronic devices, including all elements of the system such as power supplies, sensors and other input devices, data highways and other communication paths, and actuators and other output devices, used in safety related applications.

Reversing tracks - The part of the track system that carries the step wheels around the main and idler shafts, thus causing reversal of the step direction (commonly referred to as "D" tracks).

Ride quality - Vibration of escalator steps relevant to passenger perception;

Safety line - The series circuit of safety devices in the field wiring and controller that enables and maintains the main contactor.

Single point failure - A single failure, which alone is the direct cause of a hazardous condition.

Step band – The endless assembly of step chains and steps.

Step nose – The intersection point of the step riser and the tread.

Transmission elements – all components which transmit power from the main drive motor to the steps and handrails, including the motor/gearbox coupling and the attachments between the step chains and steps.

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Appendix C Machine Room Guarding

C-1 General Requirements

- C-1-1-1 In the upper machine chamber and lower machine chamber, guarding shall be fitted to both sides, the ends and the bottom of the escalator truss. The guards shall extend upwards to a minimum height of 2.5m above floor level, and for a distance of nominally 1m beyond the incline access gates.
- C-1-1-2 The clearance between the guards and machinery shall be in accordance with The Safety of Machinery Directive 2006/42/EC [9], as interpreted by BS EN 115-1; 2017 [1].
- C-1-1-3 The requirement to guard the incline truss, provided suitable guards are provided across the whole of the top and bottom of the incline. These shall effectively prevent access to any part of the escalator from the upper machine chamber and lower machine chamber areas, except by means of locked access gates.
- C-1-1-4 Where new guards are required, or if they are need to be modified due to new equipment or to allow for maintenance activities, they are to match the original guards. Guards shall be of wire mesh or sheet steel construction, which shall be welded into a rigid tubular or angular steel sub frame. The mesh size shall conform to PD 5304:2014, Appendix A [17]with the wire gauge being adequate to withstand distortion or breakage of fittings from a person suffering an accidental fall onto the guarding. The use of sheet steel shall be kept to a minimum to reduce dust traps, to ensure maximum visibility of machinery, structures or other persons, and to reduce weight. The design of guarding shall enable access to items requiring frequent attention, without having to remove complete guard panels. To meet this requirement, small access doors shall be provided within the guarding panel where appropriate. The doors shall be of the same material as the guarding, hinged from the top and fitted with a lock. The access aperture shall be fitted with stops at the bottom left and right hand corners.
- C-1-1-5 No single panel shall weigh more than 10kg and shall not be larger than 1.5m x 1m in either width or height. A maximum height and width of 1m applies for guards that are fixed in confined spaces or that require the use of a ladder for their removal.
- C-1-1-6 The guards shall not give rise to any handling risk, i.e. all panel mesh strands shall be spot welded, cut-outs and edges shall be smoothed and rounded, and any protruding metals shall be cut flush with the sub frame or truss.
- C-1-1-7 The access gates shall provide the maximum clear width and height possible. They shall be hinged and fitted with a lock. The gates, frames and any fixed panels shall be removable, as required for major maintenance or repair activities.
- C-1-1-8 All guards shall be secured by captive fixings that cannot be removed without the use of tools. In order to prevent a guard panel falling when the captive fixings are released, each panel shall be fitted with a fall arrest mechanism bracket welded to the bottom left and right hand corners pointing inwards, and seating onto a fixed member.
- C-1-1-9 Screwed fastenings shall be of grade 8.8 and shall make use of tapped holes or captive nuts. Self-tapping screws shall not be used.
- C-1-1-10 No drilling or welding of the truss members shall be carried out without prior confirmation by the *Contractor* through the provision of calculations, that the integrity of the truss is not compromised.

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Appendix D Step Chain Type (Tensile) Test

D- 1 Purpose

- D-1-1-1 The purpose of the following tests is to demonstrate that the step chains have an adequate factor of safety against the possibility of breakage.
- D-1-1-2 These tests apply to all chain types. Where the chain is of a “ladder” configuration, the *Contractor* shall make it clear as to whether the certification applies to one strand, or both strands together.
- D-1-1-3 Where the chain incorporates “cranked” male/female links in the design, the tests shall be repeated on a sample of chain containing such links.

D- 2 Destructive Test

- D-2-1-1 For the purposes of this test, the hollow outer link bushes shall be plugged with close-fitting solid bars to represent the axles, the material being the same as that specified for the axles. A tensile load shall then be applied to one end of the chain, the other end being firmly anchored to the test rig. A tensile breaking load in excess of that stipulated on the design drawings shall be achieved.
- D-2-1-2 Following this test, a certificate shall be furnished to the *Employer*, who will place this on record as a type test for the given chain type and given manufacturer.
- D-2-1-3 The destructive test certificate shall record, as a minimum:
- a) Date of test;
 - b) Name of test house;
 - c) Manufacturer of chain;
 - d) Chain type;
 - e) Drawing number(s) and revision status;
 - f) Contract number;
 - g) Materials/equipment used;
 - h) Chain length;
 - i) Tensile breaking load;
 - j) Elastic limit;
 - k) Yield point;
 - l) Elongation at point of failure;
 - m) Failure mode and damage incurred by the components.
- D-2-1-4 The test certificate shall form part of a test report. The report shall include photographic evidence of the failure, a graphical plot of the load/extension relationship, and a summary.

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Appendix E Handrail Strength Type Test

E- 1 Purpose

- E-1-1-1 The purpose of this series of tests is to demonstrate that any handrail manufactured by the *Contractor* can be expected to meet the performance requirements of this specification.

E- 2 Testing Procedure

E-2-1 Dimensional Test

- E-2-1-1 The cross-section profile (measured at any point) shall conform to the manufacturer's drawing and tolerances.

E-2-2 Elongation

- E-2-2-1 The longitudinal elastic deformation of a sample length of handrail shall not exceed 0.1% of the length, under a load of 2kN.
- E-2-2-2 After the load is removed, permanent set shall be less than 0.1% after 1 hour relaxation at room temperature.

E-2-3 Tensile Strength

- E-2-3-1 The tensile breaking load of a sample length of handrail, without a joint, shall exceed 30kN. The tensile breaking load of a sample containing one joint, made under factory conditions, shall exceed 25kN.
- E-2-3-2 A cyclic test shall be applied, whereby a suitable endless length of handrail shall be run on a test rig to simulate actual service conditions (as stated above).
- The test rig shall incorporate two internal wheels of typically 800mm diameter and a means of imparting a reverse (external) bend of 1.5m radius.
- The test shall run continuously for a minimum of 7.5×10^5 cycles, at a constant linear speed. The linear speed does not have to correspond to the actual service speed and can be the highest practical speed for the test. No visible deterioration of the handrail shall take place as a result of this test.

E-2-4 Lip Rigidity

- E-2-4-1 The force required to spread the handrail lips apart, using 100mm wide mechanical jaws acting in opposition on the inside of the lips, shall be measured. The length of the test piece shall be 500mm.
- A comparative test shall then be carried out on a 500mm long sample removed from the handrail that has undergone the cyclic test described above.
- In each case, the force required to spread the lips by 7mm shall be in excess of 130N.

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Appendix F Drive Unit - Factory Testing

F- 1 Purpose

- F-1-1-1 Factory tests shall be carried out on the drive unit and its components, to provide assurance that the service performance requirements are satisfied.
- F-1-1-2 All data obtained during tests shall be recorded on an inspection test sheet. The test sheet shall identify the manufacturer's permitted tolerances for each test.

F- 2 Static Checks

- F-2-1-1 Dimensional checks shall be made against the general arrangement drawing.
- F-2-1-2 Reference shall be made to the brake drum manufacturer's data for acceptance criteria.
- F-2-1-3 The contact area of the brake shoes or pads is to be bedded in to the manufacturer's recommendation. Confirmation shall be by removal of the brake shoes or disc pads for visual inspection.
- F-2-1-4 Full coverage of painting of castings, both internal and external shall be verified.
- F-2-1-5 The method of inspecting the gears for condition and replacement of oil seals shall be demonstrated.

F- 3 Dynamic Tests

- F-3-1-1 The drive unit shall be run continuously in each direction at the fastest specified speed for 4 hours, or until the temperatures are seen to have stabilised. Where possible, a simulated load shall be applied at 100% of the maximum motor output at full speed. In any event, a minimum of 50% load shall be applied.
- F-3-1-2 The following temperatures are to be recorded prior to the run, during the run (at 30 minute intervals) and on completion of the run. The maximum temperatures shall be within the manufacturer's standard:
- a) Oil;
 - b) Input bearings (where possible);
 - c) Output shaft bearings (where possible);
 - d) Gear casing(s);
 - e) Motor casing(s);
 - f) Ambient.
- F-3-1-3 During the loaded run, each gear case and any glands or oil seals shall be checked to ensure they are free from oil leakage.
- F-3-1-4 Each gearbox shall also be run under 'no load' conditions at full speed in each direction, for a sufficient period to record the maximum vibration amplitude at the following points. The maximum vibration shall be within the manufacturer's standard:
- a) Mounting points;
 - b) Input shaft bearing (where possible);
 - c) Non-drive end bearings;
 - d) Output shaft.
- F-3-1-5 On completion of the dynamic test run, the gearbox(es) shall be examined to check the following:
- a) Condition of lubrication oil, which shall be free of any wear debris or signs of oxidation;
 - b) Contact area of the gears, for comparison with the initial results obtained (where possible).

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Appendix G Step Testing Requirements

G-1 Purpose

- G-1-1-1 This Appendix defines the requirements necessary to obtain approval of escalator step designs for use on the TfL network. These requirements exceed those of BS EN 115, which defines the minimum requirements for type testing of escalator steps.
- G-1-1-2 The requirements have been devised to demonstrate that escalator steps can withstand all reasonably foreseeable service conditions.
- G-1-1-3 For each new, or modified, design of step, TfL reserves the right to require repeat calculations and testing, in accordance with some, or all, of the clauses of this Appendix.

G-2 Finite Element Analysis

- G-2-1-1 The Supplier shall supply an FEA model of the step, to address all the load cases defined in BS EN 115 and section H-4 of this Appendix.

G-3 Practical Testing of Step Assemblies - General

- G-3-1-1 The steps shall be in clean, unpainted condition, before commencing the tests.
- G-3-1-2 The steps shall be certified, by the Supplier, as being compliant with material constituency, dimensions and tolerances, laid down on the manufacturing drawings.
- G-3-1-3 The Supplier shall specify the foundry from which the aluminium castings have been sourced.
- G-3-1-4 The steps shall be subjected to NDT, prior to the tests, and shall be proven to be free of cracks, adopting nationally or internationally accepted criteria.
- G-3-1-5 All NDT personnel shall have undertaken the appropriate level of training, in the techniques adopted, and shall hold the appropriate certification, in the techniques adopted
- G-3-1-6 Prior to testing, the Supplier shall check that the steps have not suffered damage, during transit and handling.
- G-3-1-7 The Supplier shall be responsible for the design and manufacture of the various test rigs.
- G-3-1-8 For the testing described in H-4, the rig shall be sufficiently robust and rigid, such that the results of the test are not compromised.
- G-3-1-9 The calibration of the rig shall be undertaken by a test authority, approved by UKAS, or a body which is similarly accredited to undertake the work.
- G-3-1-10 All equipment shall be calibrated to UKAS, or similarly accredited standards.
- G-3-1-11 All tests shall be representative of the manner in which steps are supported and loaded, within the escalator.
- G-3-1-12 All deflection readings taken during the tests shall include any initial 'bedding-in' of components.
- G-3-1-13 All test results shall be fully recorded in the final report, with photographic evidence and an appropriate analysis.
- G-3-1-14 For each tested step, the record shall include, as a minimum, the manufacturing and inspection controls.

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G-3-1-15 All tested steps and associated parts used during the testing, shall be retained by the Supplier for one year from issue of the final report, such that TfL can examine the parts, if required.

G-3-1-16 Steps used for testing, shall not be installed in TfL escalators. The Supplier shall demonstrate how this is managed.

G- 4 Torsional Dynamic Test

G-4-1-1 The purpose of this clause is to provide assurance that the step does not develop cracking and / or permanent deformation, under torsional flexure.

Note: BS EN 115 allows for two methods of testing:

- either, cycling on one side of the neutral position only
- or, cycling on both sides of the neutral position, thus addressing asymmetry of the step.

TfL requires conformance to the latter.

G-4-1-2 If the contractor has demonstrated that the step is acceptable, in accordance with BS EN 115 Annex F Test 1, then Test 2 shall also be carried out. A new step shall be selected for testing.

G-4-1-3 Where BS EN 115 Annex F Test 2 is carried out, the results shall be reported, in addition to those of Test 1.

G- 5 Concentrated Load Destructive Test

Note: The purposes of this test, which is additional to BS EN 115, are:

- (i) to determine the ultimate strength and failure mode, for comparison of different step designs;
- (ii) to validate the FEA, against the test;
- (iii) to determine the onset of yielding, when simulating a scaffold loading scenario.

G-5-1-1 A new step shall be selected for testing.

G-5-1-2 The step shall be strain gauged and the Supplier shall agree the following, with LU, prior to commencement of testing:

- (i) location of the strain gauges;
- (ii) type of gauges (uniaxial, biaxial, or triaxial);
- (iii) monitoring methodology.

Note: It is only required to validate the FEA, for linear response, below yield.

(The full test will take the step well beyond yield, at which point, the gauges may de-bond, or become damaged – and hence produce erroneous results).

G-5-1-3 The step shall be supported as shown in figure 1, with its top surface level to within 1mm and using a 200mm long x 300 mm wide x 25 mm thick, steel load plate, in the middle of the step.

G-5-1-4 A load shall be applied vertically downwards, on the load plate, via a device that allows the step to deform out of the horizontal in any direction to an adequate degree, without restriction. The step shall be supported in a manner which replicates its installation in an escalator. A new step shall be selected for testing.

G-5-1-5 The step shall be gradually loaded, at a constant displacement rate of approximately 5mm per minute, until it collapses. The following shall be recorded:

- (i) applied load, recorded continuously;
- (ii) load at yield;
- (iii) load at failure;

- (iv) displacement of the ram, recorded continuously;
- (v) strains, recorded continuously.

During this period, the step shall be carefully observed and notes, with photographs, on the step failure characteristics, shall be taken.

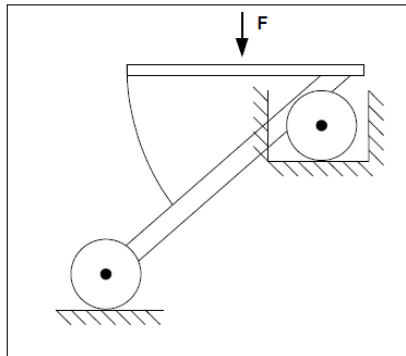


Figure 1 - Planes of restraint (step on level) for concentrated load tests

- G-5-1-6 A report shall be produced, including the information listed in clauses H-5-1-1-1 to H5-1-5 inclusive. For each strain gauge, a table of measurements *versus* FEA results shall be provided.
- G-5-1-7 Where there is a significant discrepancy, between the test results and the FEA, the report shall provide a full explanation of the reasons. Any errors shall be corrected and reported.

G- 6 Impact Test

Note: The purpose of this test, which is in addition to BS EN 115, is to determine the ultimate strength and failure mode of each step type, for comparison of different designs, under impact loading. The kinetic energy associated with a typical incident, shall be represented, approximately, by dropping a mass of 30kg from a height of 1.6m.

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- G-6-1-1 A new step shall be selected for testing.
- G-6-1-2 The step shall be set up in the same manner as that of the “Concentrated Load Destructive Test”. See section H-5.
- G-6-1-3 The Supplier shall design and construct a jig, to ensure that the mass impacts the step, perpendicular to the centre of the tread.
- G-6-1-4 A steel block no larger than 100mm wide by 100mm long and with a thickness of 25mm, shall be placed at the centre of the step.
- G-6-1-5 A mass of 30kg shall be dropped from a height of 1.6m, onto the block, using the jig.
- G-6-1-6 The top, bottom and sides of the step shall be photographed, prior to and after removal of the dropped mass and the final dimensions recorded.
- G-6-1-7 A commentary on significantly distorted and / or broken parts of the step, shall be provided.
- G-6-1-8 There are no quantified acceptance criteria for these tests, which are for comparative purposes and to understand the failure modes of the step.
- G-6-1-9 A report shall be submitted.

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Appendix C

TRS Reference 18055-DLR-EAM15-T735 Z-SP--0002

Req ID	Requirement Text	Priority	Stimulus / Response	AoD Verification	AoA Verification	Supplier Compliance	Supplier Compliance Explanation	Compliance Acceptance	Acceptance Comment	DLRL Comment
FUNCTIONAL REQUIREMENTS										
N/A										
USER REQUIREMENTS										
UR_001	New products must interface with the existing escalator installation & services and allow sufficient access to allow maintenance activities to be undertaken, as required.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Site test: Demonstration Review of installation - DLR Representative / KAD Operations					
HARDWARE REQUIREMENTS										
HR_001	New products must interface with the existing escalator installation & services.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Site test: Demonstration Review of installation - DLR Representative / KAD Operations					
SOFTWARE REQUIREMENTS										
SR_001	New products must interface with the existing services.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Site test: Demonstration Review of installation - DLR Representative / KAD Operations					
COMMUNICATION REQUIREMENTS										
CR_001	New products must interface with the existing communications installation.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Site test: Demonstration Review of installation - DLR Representative / KAD Operations					
PERFORMANCE REQUIREMENTS										
PR_001	A fully overhauled or new escalator, fully compliant to current BS EN & DLR standards and DLR requirements, shall be designed & will integrate seamlessly in to the existing environment & systems.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	AoA Acceptance / ITP / Commission / DLR Representative / KAD Operations					
PR_002	All components (except the truss) or complete unit for all escalators listed in Section 1 shall be replaced with modern equivalent, compliant with latest BS EN & DLR standards.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	-					
PR_003	All escalators shall demonstrate an improvement in ride quality / performance.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Site tests: 3-axis accelerometer					
PR_004	All escalators shall demonstrate a reduction in running noise.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Site tests: Noise measurements					
PR_005	All escalators shall have all surface finishes renewed.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Site tests: Visual inspection & comparison					
PR_006	Improvement of IP rating and other measures to a level appropriate to guarantee asset performance in the environment at the installed location.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	AoA Acceptance / ITP / Commission / DLR Representative / KAD Operations					
PR_007	The number of escalator system failures (faults / time unavailable for customer use) attributable to the escalator rather than passengers is to be demonstrably reduced.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Compare pre & post works statistics					
PR_008	The supplier shall submit a clear plan and programme of works detailing and showing the exact locations of proposed works on site.	High	Planning/ Co-ordination	AoD Acceptance / Commission / DLR Representative / KAD Operations	-					
PR_009	Undertake a comprehensive survey of the existing escalators (inc. all interfaces with services & structures, controllers, cabling & CMS (inc. tray & conduit) etc.) to mitigate risks.	High	Reduce CAPEX	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	-					
PR_010	Re-use existing CMS where condition and suitability permits.	High	Reduce CAPEX	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	-					
PR_011	Provision for new cabling & CMS.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	AoA Acceptance / ITP / Commission / DLR Representative / KAD Operations					
PR_012	The in-truss replacement or complete new escalator needs to be capable of interfacing seamlessly with the existing station assets, as per the existing installation.	High	Continued Functionality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	ITP / Commission / DLR Representative / KAD Operations					
PR_013	Fire stopping of any / all penetrations associated with the hydraulic power system between different compartmentation areas, irrespective of whether the penetrations are pre-existing or created as a result of these works.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	ITP / Commission / DLR Representative / KAD Operations					
PR_014	Testing and commissioning in accordance with the latest standards.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	ITP / Commission / DLR Representative / KAD Operations					
PR_015	Provision of training / familiarisation for KAD depot operations and maintenance staff.	High	Continued Functionality	AoD Acceptance / DLR Representative / KAD Operations	Evidence of training (signed attendance sheet)					
PR_016	Replacement of any building materials and other services damaged or disturbed by the works, including 'making-good'.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative / KAD Operations	Review of installation - DLR Representative / KAD Operations					
PR_017	Removal of any assets made redundant by the works & identified as not required and offer up to the maintainer (KAD) as spares.	High	Safety / Quality / Continued Functionality	Draft schedule of potential spares	DLR Representative / KAD Operations					
PR_018	The supplier shall produce all documentation necessary to enable the AiP to be achieved.	High	Design Assurance/ Compliance							
PR_019	The supplier shall produce all documentation necessary to enable the AoD to be achieved.	High	Design Assurance/ Compliance	AoD Acceptance (full design - not partial) / ITP / Commission / DLR Representative / KAD Operations	See PR_027					
PR_020	Disposal of existing assets & materials ensuring compliance with all legislative requirements.	High	Recycling. Reduce clutter	AoD Acceptance / ITP / Commission / DLR Representative	Waste Transfer Notes					
PR_021	All works shall comply with DLR requirements, DLR Engineering standards, IEE wiring regulations and relevant British Standards.	High	Safety / Quality	AoD Acceptance / ITP / Commission / DLR Representative	Review of installation - DLR Representative / KAD Operations					
PR_022	The works shall not adversely affect the normal operation of the station, airport or the railway, unless wholly unavoidable.	High	Continued Functionality	AoD Acceptance / ITP / Commission / DLR Representative	-					
PR_023	Designs must have sufficient detailing to enable the works, ensuring, where applicable, any structural / architectural / civils works required to complete the works are included in the design.	High	Design co-ordination	AoD acceptance/ITP/ Commission/ DLR representative	-					
PR_024	The Designer shall ensure all required plans and drawings are up to date as part of AoD submission.	High	Design assurance/ safety/ compliance	AoD acceptance/ITP/ Commission/ DLR representative	-					
PR_025	Drawings shall be made available in A3 format; Portable data file (PDF) and Microstation. - Structure, format and content must meet the requirements of the DLR BIM system.	High	CAD compliance / Quality	AoD Acceptance / ITP / Commission / DLR Representative	A3 Drawings supplied in PDF & Microstation formats.					
PR_026	All value engineering exercises are welcomed from suppliers / Contractors.	High	Reduce CAPEX	AoD Acceptance / ITP / Commission / DLR Representative	-					
PR_027	The supplier shall produce or supply all documentation necessary to enable the AoA to be achieved - including, but not limited to, Operation & Maintenance Manuals (O&M's) and as-built drawings.	High	Assurance / Safety / Co-ordination	See PR_019	AoA Acceptance / ITP / Commission / DLR Representative / KAD Operations					
PR_028	Provide updated asset registers / forms, covering assets removed & assets installed.	High	Assurance / Safety / Co-ordination	Partially completed asset registers / forms (assets being removed).	Completed asset registers / forms. AoA Acceptance / Commission / DLR Representative / KAD Operations.					
PR_029	Supply of 10% spare (new) parts or as required to enable on-going operation and maintenance of the new system. Notes: 1) The exact spare parts are to be discussed with DLRL and the maintainer (KAD). 2) Any spares provided as part of fulfilling PR_0017 do not count towards the 10% requirement of PR_0029.	High	Assurance / Safety / Co-ordination / Continued Functionality	Proposal of spares to be supplied.	Agreed list of spares & delivery note confirming spares have been delivered to DLRL / KAD preferred location. AoA Acceptance / DLR Representative / KAD Operations					
PR_030	The supplier shall ensure that the existing electrical supply is suitable for use with the new equipment. If not, the supplier shall undertake design & cable calculations and remedy to ensure the electrical supply is fit for purpose & compliant to the latest standards.	High	Assurance / Safety / Co-ordination / Continued Functionality	AoD Acceptance / ITP / DLR Representative	AoA Acceptance / Commission / DLR Representative / KAD Operations.					

Req ID	Requirement Text	Priority	Stimulus / Response	AoD Verification	AoA Verification	Supplier Compliance	Supplier Compliance Explanation	Compliance Acceptance	Acceptance Comment	DLRL Comment
ENVIRONMENTAL REQUIREMENTS										
EN_001	New equipment must not be excessively susceptible to normal expected temperature ranges.	High	Satff/Customer comfort	AoD Acceptance / ITP / Commission / DLR representative	See PR_007					
EN_002	New equipment must not be excessively susceptible to normal expected humidity range.	High	Satff/Customer comfort. Reduce OPEX	AoD Acceptance / ITP / Commission / DLR representative	See PR_007					
EN_003	New equipment must not be excessively susceptible to expected moisture levels.	High	Reduce OPEX	AoD Acceptance / ITP / Commission / DLR representative	See PR_003; PR_004 & PR_007					
EN_004	New equipment must not be excessively susceptible to vibration nor must it produce excessive vibration.	High	Reduce OPEX	AoD Acceptance / ITP / Commission / DLR representative	See PR_003; PR_004 & PR_007					
SAFETY REQUIREMENTS										
SR_001	The new equipment shall include all the features necessary for safe operation and maintenance.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR representative	Function Test					
SR_002	The failure modes of equipment shall not present a hazard to maintenance staff and others.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR representative	Function Test					
SR_003	All equipment shall be maintainable, without unnecessary risk to health and safety.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR Representative	Review of installation - DLR Representative / KAD Operations					
SR_004	All new cables shall be low smoke, zero halogen.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR Representative	Cable data sheets & CoC's					
SR_005	The designer shall demonstrate a sound hazard identification and risk mitigation process: A designer's risk assessment shall be provided and shall be subject to acceptance by DLRL.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR Representative	-					
SR_006	FMEA covering the systems and individual items of equipment shall be provided.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR Representative	Completed FMEA					
SR_007	Supplier to be compliant with relevant British Standards & Euro Norms.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR Representative	Certificate stating compliance to the applicable standards					
SR_008	Supplier to be compliant with applicable DLR Standards.	High	Design Assurance / Compliance / Safety	AoD Acceptance / ITP / Commission / DLR Representative	Statement or certificate stating compliance to the applicable standards					
SR_009	Evacuation routes shall not be impeded.	High	Site safety	AoD Acceptance / ITP / Commission / DLR Representative	Review of installation - DLR Representative / KAD Operations					
OPERATIONAL & MAINTENANCE REQUIREMENTS										
OR_001	Equipment labelling shall be sufficient to support all operations and maintenance activities under normal and degraded conditions and in line with DLR standards.	High	Design assurance / Compliance / Operations	AoD Acceptance / ITP / Commission / DLR Representative	Review of installation - DLR Representative / KAD Operations					
OR_002	Special tools and equipment for operation, maintenance and fault finding shall be provided, where required.	High	Design assurance / Compliance / Operations	AoD Acceptance / ITP / Commission / DLR Representative	Review of installation - DLR Representative / KAD Operations					
OR_003	Maintainer training shall be provided for all equipment that is different from that already in use on the operational railway.	High	Design assurance / Compliance / Operations	AoD Acceptance / ITP / Commission / DLR Representative	See PR_010					
OR_004	The equipment should be configured and built to allow any component to be safely replaced without the need to shut down or disrupt the system as a whole, unless unavoidable.	High	Design assurance / Compliance / Operations	AoD Acceptance / ITP / Commission / DLR Representative	Review of installation - DLR Representative / KAD Operations					
SECURITY REQUIREMENTS										
N/A										
RAMS REQUIREMENTS										
RAM_001	Availability	High	System to be available at all times within the designated operating temperature range	AoD Acceptance / ITP / Commission / DLR Representative	See PR_003					
RAM_002	System to be easily maintainable	High	System to be available at all times within the designated operating temperature range	AoD Acceptance / ITP / Commission / DLR Representative	See PR_007; PR_0012; and OR_001 to 004 (inc.)					
EMC REQUIREMENTS										
EMC_001	The designer shall demonstrate understanding and compliance with EMC requirements at the AoD stage.	High	Design assurance / Compliance / Operations	AoD Acceptance / ITP / Commission / DLR Representative	-					
EMC_002	All parts of the system shall comply with DLR-ENG-STD-ES102.	High	Design assurance / Compliance / Operations	AoD Acceptance / ITP / Commission / DLR Representative	-					
HUMAN FACTORS REQUIREMENTS										
N/A										
QUALITY REQUIREMENTS										
N/A										

**Transport for
London**



Sonic Rail Services Ltd

On Behalf Of

DOCKLANDS LIGHT RAILWAY


DLR Project No: 2013-090-01

Escalator Survey

London City Airport

DLR Station

1309001-SRS-EAM15-T735_Z-RP-W-0005

Rev 00	15/07/2018	First Issue	

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1 Description of Works

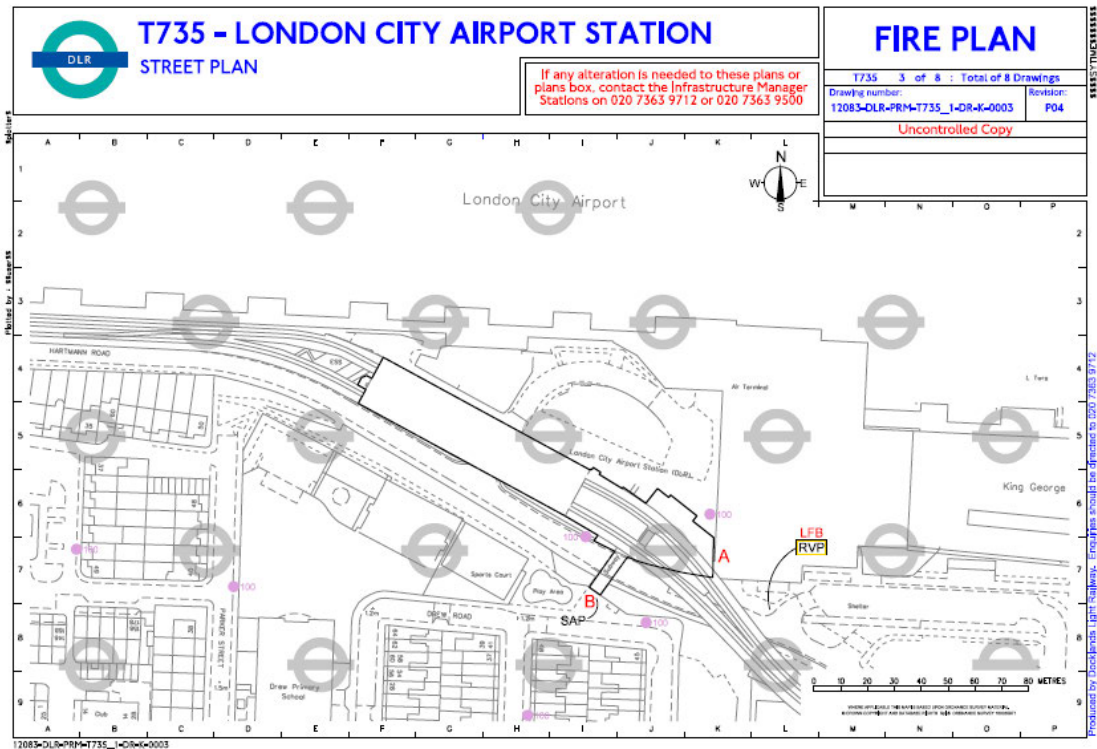
Docklands Light Railway is planning to undertake a programme of escalator overhauls as part of its programme of work in the ten-year asset investment requirements plan. In order to inform the specifications for the invitation to tender documents it is necessary to obtain site specific information for the Two escalators at London City Airport DLR Station.

- Escalators 1&2 serve platforms 1&2 from DLR Ticket Hall

1.1 Location of Works

London City Airport
Hartmann Rd,
London
E16 2PX

Station Street Plan



1.2 Scope of Works

A non-intrusive survey of the existing escalator environment has been carried out to ascertain information for the proposed replacement of these escalators, to include:

- All the information regarding the escalator power supply and the method of isolation of the power to the escalator.
- All the information regarding the presence of a machine room or not. If what is the provision for controllers
- All the layout drawings of the existing escalator which will identify the foot print and beam to beam sizes and rise of the escalator installed.
- All the information regarding the fire systems on the escalator at present confirmation if it is live.
- Any station issues in regard to other assets attached or around the escalator cladding, rooms, lighting, comms etc.
- Site constraints for removal and delivery of the old and new machines.
- Water ingress above or below the machine.

2 Third Party Interface/Stakeholder Information

2.1 Client

Docklands Light Railway Ltd
Castor Lane,
Poplar,
London E14 0DS
Tel: 0343 222 1234

2.2 Maintainer /Operator

Keolis Amey Docklands
Castor Lane,
Poplar,
London E14 0BL
Tel: 020 7363 9500

2.3 Local Authority

London Borough of Newham
Newham Dockside
1000 Dockside Road
London

E16 2QU
Tel: 020 8430 2000.

2.4 London City Airport

Hartmann Rd,
London
E16 2PX
Tel: 0343 222 1234

3 Existing Asset Information

The London City Airport Escalators are supported on bearing pads at the top and bottom levels with one intermediate support.

The escalators span from ticket hall level to platform level at which sit at approximately 11.23 metres above street level. The units are self - contained and all control equipment is housed within the truss.

The Two original Escalators were supplied by Schindler Ltd

3.1 Key Measurements

Asset	Rise (FFL to FFL)	Total length	Angle	Steps	Radius Top Curve	Radius Lower Curve
Escalator 1	6919	17642	30	N/K	1500	1000
Escalator 2	6919	17642	30	N/K	1500	1000

Asset	Run off Lower Landing	Run off Top Landing	FFL to Bearing Top Landing	FFL to Bearing Lower Landing	Intermediate support	
Escalator 1	1200	1200	160	160	One	
Escalator 2	1200	1200	160	160	One	

3.2 Drawing Register (Appended)

Escalator Details	RK94142_DISPO-D545443_XX
Fire System Single Line Diagram	32511-LCY-DRG-00146-X0

3.3 Reference Documents

Schindler LTD O&M Manual	U1010162
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4 Existing Power Supply Information

4.1 Characteristics

	Main Supply Size /Location	Local Isolation Size Location	Existing Design Loads Start / Run	Cable sizing Phase /CPC
Escalator 1	100A TP&N MCCB (SID 1/662)	40A BS88/32A MCCB Motor Box Isolator	65.6 / 14.3A	Unknown
Escalator 2	100A TP&N Switch Fuse (SID 1/662)	40A BS88/32A Motor Box Isolator	64A / 14.3A	Unknown

5. Fire System Information

5.1 Escalator Specific

	Linear Heat	Detection	Suppression	Enabled	SCADA
Escalator 1	YES KENTEC	NO	NO	ID 107 Signal Interface Module (1/662)	NO
Escalator 2	YES KENTEC	NO	NO	ID 108 Signal Interface Module (1/662)	NO

Main fire panel is located in Room 1/662

6. Machine Room Information

Not applicable to this station

7. Interface with other services & Structures

The Escalators at London City Airport at platform level are located within an elevated glazed enclosure to the east of platforms 1&2 providing access to the ticket hall level. This is also the pedestrian route for lift access to the ticket hall which should be considered during the construction phase. The areas beneath the inclines have been built in to accommodate storage areas and also house the intermediate escalator support. Each escalator can be treated as a separate site for works. Lighting of the escalators is provided by the existing station lighting at Platform and ticket hall levels.

Interfaces to be considered are:

- Platform Interface finishes concrete paviour
- Ticket Hall floor interface (Terrazzo Tiles)
- Automatic Passenger Counters (Lower levels)
- Enclosures around Escalators (Glazed)
- Protection of Assets within London City Airport
- Ticket Hall Fire Detection Systems
- Access to Lifts 1&2 (A/136-A/137)
- Storage Areas 1/406 – 1/411 & 1/412
- Access to HV Switch room 1/161
- Maintain Access to platform staircase A/602

8. Water Ingress

There are no apparent Water ingress issues at London City Airport. Both escalators are fitted with Water detection devices.

9. Site Constraints

Security would be a major consideration at this location due to the vicinity of the airport and should be taken into consideration at all stage of the works.

All stakeholders are to be consulted prior to works.

Access via the ticket hall is difficult and would need to be carefully planned with all stakeholders.

There is reasonable space below the platform viaduct for a site compound /storage but again would need to be agreed with all parties with security in mind.

9.1 Deliveries

Delivery of major components would be made via RRV /Engineering Vehicle during Engineering Hours. Possession /Closure opportunities should be used /sought for delivery of modules or major components. Consideration would need to be made for loading on top landings /Platforms.

9.2 Access

All access is to be agreed with all stakeholders noted in section 2 of this document and in line with DLR Working on the Rail Manual (Worm)

9.3 Road Deliveries

Road access to the main entrance would be limited although road access to the service areas is viable.

All deliveries should be in accordance with the specified times of the Section 60 agreement with the local authority.

10. Residual Risks

10.1 General

- **Train operations**
Train operations will run as normal during construction. Where the worksite envelope interfaces with the platforms, care is to be taken when entering and exiting the worksite.
Works are to be Risk Assessed and controls put in place.
- **Passengers / Public**
Train services and the retail areas will remain operational during the construction.
Care is to be taken when working around the public.
Works are to be Risk Assessed and controls put in place.

10.2 Decommissioning Specific

- **Moving Walkways**
If adjacent machinery cannot be isolated a physical screen is to be installed to protect the work force. Only competent personnel are to be involved in the removal of machinery in accordance with approved safe system of work.
- **Electricity**
Upon completion of removal of step band, all 230v /400v electrical supplies should be isolated by a competent person and permits to work issued. All site supplies for construction phase of the works will be 110 v centre tapped.
- **Working at Heights**
Due to the location of the escalators, working at Height would unavoidable and could pose significant risk
All works to be carried out in line with working at height regulations 2005. All planned works to be risk assessed and adequate controls put in place.
- **Control of Substances Hazardous to Health.**

Materials that the workforce may be exposed to during de-commissioning stage. COSHH assessments are to be carried out in line with COSHH Regulations 2002

- Mobil: Motorgear 634
- BP: Energol GR-XP460
- ESSO:Spartan EP460
- Shell: Omala 360
- BP: Energol GR-XP220
- Shell: Omala 220
- BP:Energrease LS3
- Mobil: Multiugrease 2
- Esso: Beacon 3
- Shell: Alvaria R3
- Kluber: Cantoplek GLP402

Manufactures Safety and Data sheets for these products are contained within the Schindler O&M Manual U1010162 and are available on request to DLRL.

- **Asbestos**

SRS have been advised that due to the age of these assets it is unlikely that the workforce will encounter asbestos within this station.

The management of asbestos will be in line with the contractor's own policies and the Care of Asbestos Regulations 2012

10.3 Installation Specific

As sections 10.1 & 10.2 above

- **Temporary Works**

Risk of failure /Collapse

It is considered that temporary works /staging would be required for replacement of these escalators.

A full Cat 2 design is to be provided for all Hoardings, formworks, falseworks, scaffold installations to account for full design loading. All installations are to be inspected at the legislated intervals and records maintained.

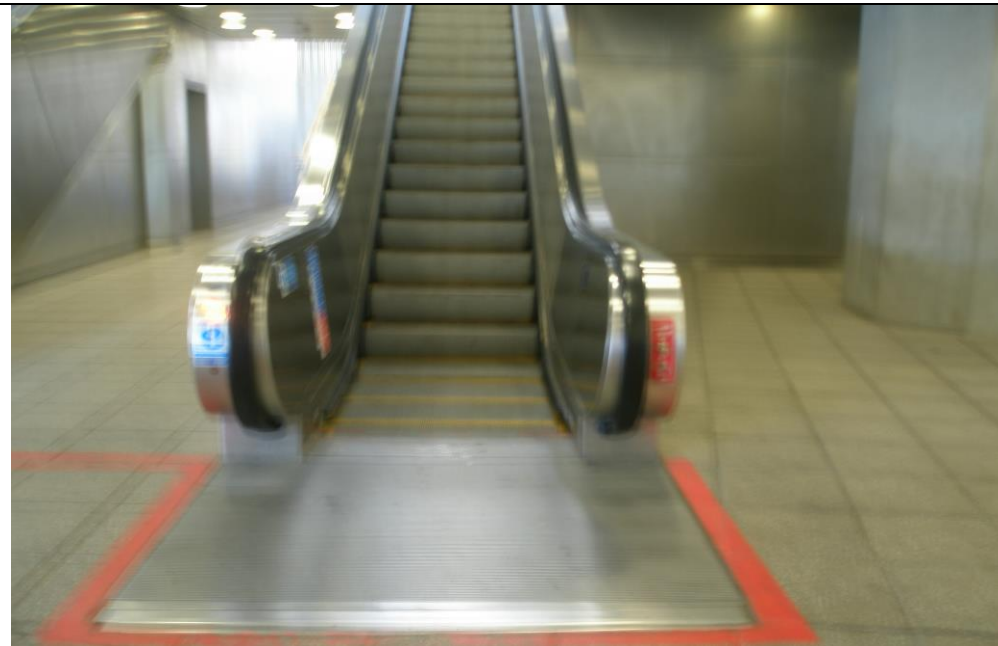
- **Testing & Commissioning**

It will be necessary for workforce to come into contact with Moving machinery during this phase of works. All works to be carried out by qualified personnel under agreed Test & Commissioning plan.

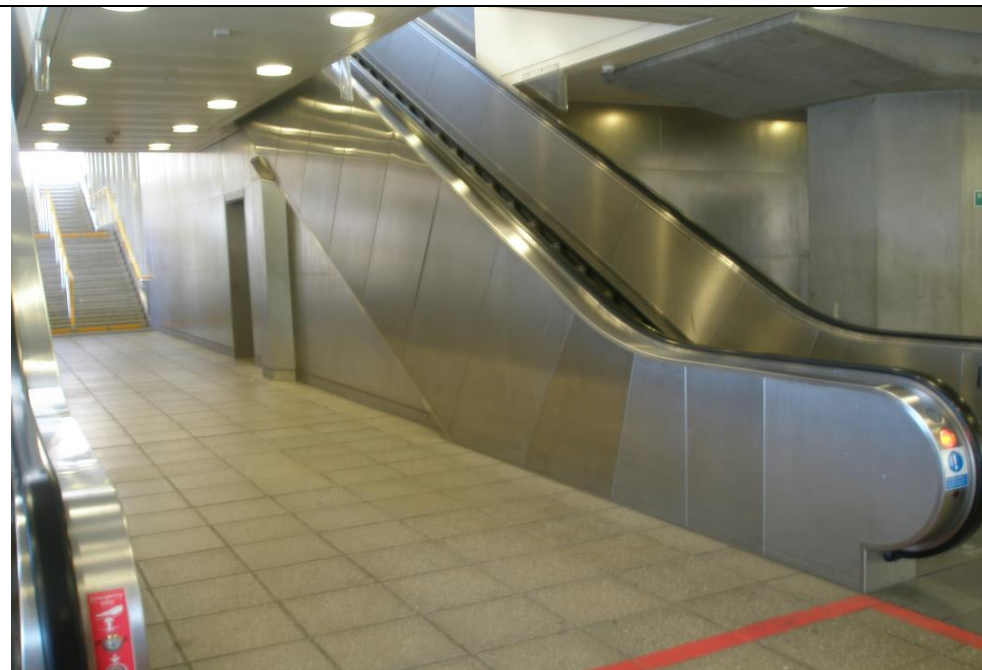
11. Site Photographs



Overview in Ticket Hall



Escalator 1 -Ticket Hall Interface



Escalator 1 Ticket Hall Level



Escalator 2 Ticket Hall Interface



Escalator 2 Ticket Hall Level



Pedestrian Route for Staircase to Platforms 1&2



Escalator 1 Platform Level



Escalator 2 Platform Level



Escalator 1 Intermediate Support -Store 1/411



Escalator 2 Intermediate Support -Store 1/412



LV Distribution Board -Escalator 1 & 2 Supplies

LONDON CITY AIRPORT MAIN LV PANEL BOARD

PANEL BOARD No: LCY/SWB/001

SUPPLIED FROM: PDR TFR 001 & TFR 002

amec

WAY No	MCCB	Description
1	100A	LCY/LDB01 MAIN LIGHTING DISTRIBUTION BOARD
2	100A	LCY/SP/DB02 LIGHTING AND SMALL POWER DISTRIBUTION BOARD
3	100A	LIFT No 1 SUPPLY
4	100A	LIFT No 2 SUPPLY
5	100A	LIFT MOTOR ROOM DISTRIBUTION BOARD
6	100A	3 PHASE 10kVA STATIC INVERTER
7	100A	SIGNAL ROOM DISTRIBUTION BOARD
8	100A	COMMS ROOM CHANGE OVER SWITCH
9	100A	
10	100A	TEMPORARY SUPPLY TO CABINS
11	25A	FIRE ALARM PANEL
12	100A	POINTS HEATING SUPPLY ISOLATOR
13	100A	SIGNAL ROOM MAIN SUPPLY ISOLATOR
14	100A	RETAIL UNIT METERED SUPPLY ISOLATOR
15	100A	LCY/SP/DB03 CUSTOMER SERVICES DISTRIBUTION BOARD
16	100A	ESCALATOR No 1 SUPPLY
17	100A	ESCALATOR No 2 SUPPLY

LV Distribution Board Schedule



KENTEC Fire Panel, L.V. Switchroom 1/662



All information derived in this SRS survey report is the result of limited Non- intrusive surveys, some information may be deficient due to access constraints at the time of survey. Information/Dimensions should be verified by the appointed Designer / Escalator Contractor on appointment of contract.



14 Appendices

14.1 Appendix A - Reference Drawings

- Escalator Detail - RK94142_DISPO-D545443_XX
- Fire System SLD- 32511-LCY-DRG-00146-X0



14.2 Appendix B Station Fire Plans

14.3 Appendix C- Applicable Standards

BS EN 115-1:2017	Safety of escalators and moving walks [1];
BS 7801	Code of practice for safe working on escalators and moving walks [2]
BS EN 13015	Maintenance for lifts and escalators - Rules for maintenance instructions
BS 8300	Design of buildings and their approaches to meet the needs of disabled people.
DLR-ENG-STD-ES001	Standard for Standards
DLR-ENG-STD-ES102	Engineering EMC
DLR-ENG-STD-ES201	Communication Systems
DLR-ENG-STD-ES502	Station Areas
DLR-ENG-STD-ES503	Sub Surface Stations
DLR-ENG-STD-ES601	Electrical Power Supplies
DLR-ENG-STD-ES602	Building and other services Mechanical & Electrical
DLR-ENG-STD-ES604	Earthing Bonding and Corrosion Protection
DLR-ENG-STD-ES605	Electrical Installation Standards
DLR-ENG-STD-MR600	Maintenance Standards for Electrical & Mechanical Services
KAD - OI-601	Operational Instruction -Electrical Safety Rules.
SOP PC 3.08	Working on the Railway Manual – Engineering Vehicles.

This does not constitute a comprehensive list, other standards may apply. Please refer to the Tender Requirements Specification at tender stage.



**Custom House and London City Airport
Escalator Repair Works**

2018-055-01

Activity Schedule

GENERAL NOTES

- 1.1 In this Activity Schedule, terms identified in the Contract Data are in italics and defined terms in the conditions of contract have capital initials.
- 1.2 The prices and rates in this Activity Schedule are 'lump sum' basis and all rates and prices are fixed until the *works* are complete and shall not be adjusted for any change in material prices, wage rates, taxation or for inflation during the course of the *works*.
- 1.3 The *Contractor* has made due allowance in his rates and prices for any constraints to his method of working.
- 1.4 Descriptions of the activities in this Activity Schedule are not in accordance with any standard method of measurement and are not held out as fully describing all the work necessary to complete the activity so described, or as being exhaustive of all items or work necessary for its proper completion.
- 1.5 This Activity Schedule is deemed to cover and incorporate all the work required to properly carry out and complete the *works* as set out in the Works Information.
- 1.6 The *Contractor* is deemed to be competent and experienced in carrying out works of a similar nature, size and complexity to the *works* and on such basis it is incumbent upon the *Contractor* to have ascertained for himself the full and complete requirements to properly carry out and complete the *works*. Any lack of detail or description in this Activity Schedule in respect of the *works* will not be grounds for a claim from the *Contractor* for additional payment or for an extension of time arising from such lack of detail or description to the extent that as a competent contractor experienced in carrying out works of a similar nature, size and complexity to the *works* the *Contractor* ought to have known about and have allowed for such details or descriptions in its price and programme.
- 1.7 Item totals, rates and prices as the case may be, in this Activity Schedule are deemed as 'all inclusive' and shall include, without limitation, for all cost associated with the labour, materials, plant, tools, equipment, supervision, transport, accommodation and all on-site and head office overheads required by the *Contractor* to carry out and complete the works.
- 1.8 The Price for the *works* is deemed to allow for the design and installation of all necessary support and temporary works required to carry out and complete the *works*.
- 1.9 In those circumstances where materials or goods are supplied to the tenderer on a "Free Issue" basis, the tenderer is deemed to have allowed for ordering forward, taking delivery, unloading, unpacking, stacking, storing, sorting, distribution, hoisting, assembly, setting to work, etc.

This Activity Schedule is the build-up to the total Price for the *works*.
- 1.1 The amounts entered against each of the items listed in the Activity Schedule includes for everything needed by the *Contractor* to carry out and complete that item of work in full compliance with the requirements of the Works Information, including without limitation, labour, materials, plant, supervision, overheads and profit as described above.
- 1.2 The risk and responsibility for estimating the Price for each Activity in the Activity Schedule rests entirely and solely with the *Contractor*. If there is no Price inserted or if the word "Included" is inserted against any item in the Activity Schedule, that item is deemed to be at zero cost to the *Employer*.
- 1.3 The total amount for all the items listed in the Activity Schedule is the total Price for the works.



- 1.4 All Prices included in the Activity Schedule are fixed for the duration of the Contract and shall not be subject to any adjustment arising from inflation or increase or decrease in any duty or taxation other than changes to VAT.
- 1.5 All Activities listed in this Activity Schedule are deemed to cover everything required to carry out and complete the *works*.



Works Information Reference	Description	Qty	Unit	Rate	£	p
-----------------------------	-------------	-----	------	------	---	---

A	WORKS INFORMATION –WI100-WI1500 PREAMBLES AND PRELIMINARIES					
1	Complying with all requirements and obligations of: Works Information – WI100-WI1500	1	Item	Included		Included
	Total Works Information Preambles and Preliminaries WI100 –WI1500: To General Summary					Included

WORKS INFORMATION – PERMENANT WORKS WI2000						
2	Complying with all requirements and obligations of: Works Information WI2000					
	Custom House Escalator 1					
(a)	Design	1	Item	Included		Included
(b)	Installation	1	Item	£ 42,156.20		£ 42,156.20
(c)	Materials	1	Item	£ 42,261.00		£ 42,261.00
(d)	Testing, Commissioning and Handover	1	Item	Included		Included
	Custom House Escalator 2					
(e)	Design	1	Item	Included		Included
(f)	Materials Installation	1	Item	£ 37,185.00		£ 37,185.00
(g)	Materials	1	Item	£ 42,261.00		£ 42,261.00
(h)	Testing, Commissioning and Handover	1	Item	Included		Included
	London City Airport Escalator 1					
(i)	Design	1	Item	Included		Included
(j)	Materials Installation	1	Item	£ 22,045.00		£ 22,045.00
(k)	Materials	1	Item	£ 49,531.00		£ 49,531.00
(l)	Testing, Commissioning and Handover	1	Item	Included		Included
	London City Airport Escalator 2					
(m)	Design	1	Item	Included		Included
(n)	Materials	1	Item	£ 22,045.00		£ 22,045.00
(o)	Testing	1	Item	£ 49,531.00		£ 49,531.00



(p)	Installation	1	Item	Included	Included
	Total Works Information WI 2000 Permanent Work: to General Summary				£ 307,015.20

GENERAL SUMMARY					
	Works Information – Preambles and Preliminaries	1	Item	Included	Included
	Works Information – Permanent Works	1	Item	£ 307,015.20	£ 307,015.20
	TOTAL				£ 307,015.20



**Custom House and London City Airport Escalator
Repair Works**

2018-055-01





















Site Information

1 The Site.















1.1 The *works* are to be carried out at Custom House Station. The Site is are further detailed in the attached documents:















(a) Custom House Station Health and Safety File and O&M

(b) Custom House Architectural Drawings

Name
 14077-DYB-EAM-T255_A-DR-E-0001 E,M Mezzanine Level Proposed Lighting Layout Sheet 1
 14077-DYB-EAM-T255_A-DR-E-0002 E&M Mezzanine Level Proposed Lighting
 14077-DYB-PRM-T255_1-DR-A-3100 P07
 14077-DYB-PRM-T255_1-DR-A-3101 P06
 14077-DYB-PRM-T255_1-DR-A-3102 P07
 14077-DYB-PRM-T255_1-DR-A-3200 P06
 14077-DYB-PRM-T255_1-DR-A-3201 P05
 14077-DYB-PRM-T255_1-DR-A-3202 P06
 14077-DYB-PRM-T255_1-DR-A-3545
 14077-DYB-PRM-T255_A-DR-A-3110 P06
 14077-DYB-PRM-T255_A-DR-A-3111 P05
 14077-DYB-PRM-T255_A-DR-A-3112 [0,2]
 14077-DYB-PRM-T255_A-DR-A-3546
 14077-DYB-PRM-T255_Z-DR-A-3001 P03
 14077-DYB-PRM-T255_Z-DR-A-3305
 14077-DYB-PRM-T255_Z-DR-A-3307
 14077-DYB-PRM-T255_Z-DR-A-3310
 14077-DYB-PRM-T255_Z-DR-A-3312
 14077-DYB-PRM-T255_Z-DR-A-3400 P05
 14077-DYB-PRM-T255_Z-DR-A-3401 P03

(c) Custom House Curtain Wall Drawings

name
 19362_100_rev C1_Elev of Screen Grid Stick
 19362_100_rev C1_marked up
 19362_101_rev C1_Elev of Screen indicating glass frit pattern
 19362_102_rev C1_marked up
 19362_102_rev C1_Vertical Sections Through Screen
 19362_103_rev C1_Upper Screen Head Detail
 19362_104_rev C1_Upper Screen Cill Detail
 19362_105_rev C1_Intermediate and Cill Detail thro Rake
 19362_106_rev C1_Lower Screen Head and Cill Detail
 19362_106_rev C1_marked up
 19362_107_rev C1_Upper Screen Left Hand Jamb & Intermediate Detz
 19362_108_rev C1_Upper & Lower Right Hand Jamb Detail
 19362_109_rev C1_Frit Pattern Concept & Setting Out
 AA100 SSG Installation Manual

name
 19362_100_rev C1_Elev of Screen Grid Stick
 19362_100_rev C1_marked up
 19362_101_rev C1_Elev of Screen indicating glass frit pattern
 19362_102_rev C1_marked up
 19362_102_rev C1_Vertical Sections Through Screen
 19362_103_rev C1_Upper Screen Head Detail
 19362_104_rev C1_Upper Screen Cill Detail
 19362_105_rev C1_Intermediate and Cill Detail thro Rake
 19362_106_rev C1_Lower Screen Head and Cill Detail
 19362_106_rev C1_marked up
 19362_107_rev C1_Upper Screen Left Hand Jamb & Intermediate Detz
 19362_108_rev C1_Upper & Lower Right Hand Jamb Detail
 19362_109_rev C1_Frit Pattern Concept & Setting Out
 AA100 SSG Installation Manual

(d) Custom House Station Detail Design East Route 3 Car Capacity Enhancement & HV/LV Upgrade Projects Document Reference TC111111/CUH/DD/003 REV. 00

(e) Custom House Civils Design

4a-049-CS-FAB-2DR-2200001
4a-049-CS-FAB-2DR-2200002
4a-049-CS-FAB-2DR-2200003
4a-049-CS-FAB-2DR-2200011
4a-049-CS-FAB-2DR-2200012
4a-049-CS-FAB-2DR-2200013
4a-049-CS-FAB-2DR-2200014
4a-049-CS-FAB-2DR-2200015
4a-049-CS-FAB-2DR-2200021
4a-049-CS-FAB-2DR-2200022
4a-049-CS-FAB-2DR-2200023
4a-049-CS-FAB-2DR-2200024
4a-049-CS-FAB-2DR-2200025
4a-049-CS-FAB-2DR-2200031
4a-049-CS-FAB-2DR-2200032
4a-049-CS-FAB-2DR-2200033
4a-049-CS-FAB-2DR-2200034
4a-049-CS-FAB-2DR-2200035
4a-049-CS-FAB-2DR-2200041
4a-049-CS-FAB-2DR-2200042
4a-049-CS-FAB-2DR-2200043
4a-049-CS-FAB-2DR-2200044
4a-049-CS-FAB-2DR-2200051
4a-049-CS-FAB-2DR-2200052
4a-049-CS-FAB-2DR-2200053
4a-049-CS-FAB-2DR-2200054
4a-049-CS-FAB-2DR-2200055
4a-049-CS-FAB-2DR-2200061

(f) London City Airport - Fire Plan

1.2 The above locations are collectively the Site and individually each is a “work location” within the Site. The *Site* and the individual work locations are more fully described in the Technical Requirements Specifications and associated Appendices.

2 Access to the *Site*.

2.1 Access to the site will be on the dates stated in the Contract Data.

2.2 The *Contractor* examines and familiarises himself with the access conditions of the *site* and to ascertain all access constraints that may impact on the carrying out of the *works*. Claims from the *Contractor* for additional payment and/or additional time will not be entertained arising from a lack of knowledge by the *Contractor* in respect of same, whether it should have been known or not.

2.3 The *Contractor* is made aware that the Site will continue in use during the course of the *works* and the *Contractor* allows for any disruption this may cause to the *Contractor's* access and egress of the *site*.

2.4 The *Contractor* acknowledges that there is a need for a reasonable degree of flexibility on the part of the *Contractor* with regards to the use of the works area and facilities provided by the *Employer* as they may vary from time to time due to the Employer's operational requirements.



- 2.5 The Contractor acknowledges and is made aware that the site and/or access routes to the site may also be used by Others carrying out other works at the Site and the Contractor includes for any reasonable impact this may have on his works.

3 Facilities.

- 3.1 There is no/limited parking at the Site.
- 3.2 The *Contractor* provides everything else required for the *works*.

4 Site Rules

- 4.1 The Contractor shall ensure that all his operatives comply with the requirements of the Working on the Railway Manual where appropriate for the carrying out of the *works*.
- 4.2 The *Contractor* allows for each of his site staff and operatives, including any sub-contractors to undertake a half a day of site-specific induction prior to starting work on the site.

5 Working Hours of the Site

- 5.1 The site working hours are as stated in the Works Information.