



Manufacture and Supply Agreement

London Underground Limited

and

Siemens Mobility Limited

for the delivery of the Deep Tube Upgrade Programme

2018

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BETWEEN:

- (1) **LONDON UNDERGROUND LIMITED** (Registered Number 01900907) a company incorporated under the laws of England and Wales whose registered office is at 55 Broadway, London, United Kingdom, SW1H 0BD ("**Purchaser**"); and
- (2) **SIEMENS MOBILITY LIMITED** (Registered Number 016033) a company incorporated under the laws of England and Wales whose registered office is at Faraday House, Sir William Siemens Square, Frimley, Camberley, GU16 8QD ("**Manufacturer**").

WHEREAS:

- (A) The Purchaser currently operates passenger services on the LUL Network.
- (B) Transport for London is sponsoring the Deep Tube Upgrade Programme.
- (C) Transport for London has determined that new rolling stock will be required to support the delivery of the Deep Tube Upgrade Programme and has held a competition, in accordance with the Utilities Contracts Regulations, to identify the most economically advantageous means of procuring the supply of the rolling stock and related equipment which meets the technical, financial and operational requirements specified in this Agreement.
- (D) The Parties wish to enter into this Agreement to record the terms on which the Manufacturer will design, build, test, commission and supply rolling stock and the related equipment for use in the provision of passenger services on the Piccadilly Line and, as options, on the Bakerloo Line (including on any extension thereto), Central Line and Waterloo & City Line, and provide other ancillary services.

IT IS AGREED:

1. DEFINITIONS AND INTERPRETATION

1.1 Definitions

In this Agreement the following words and expressions shall have the following meanings save where the context requires otherwise:

"Acceptance" means:

- (a) in respect of any Train, Provisional Acceptance or Qualified Provisional Acceptance of that Train;
- (b) in respect of any Train Driving Simulator, Equipment Acceptance of that Train Driving Simulator; and
- (c) in respect of any First-in-Class Equipment, Equipment Acceptance of that First-in-Class Equipment,

and **"Accept"** and **"Accepted"** shall be construed accordingly;

"Acceptance Criteria" means the Pre-Provisional Acceptance Criteria, the Provisional Acceptance Criteria, the Final Acceptance Criteria, the Fleet Acceptance Criteria and the Equipment Acceptance Criteria and all or any of them as the context requires;

"Acceptance Liquidated Damages" means liquidated damages payable by the Manufacturer pursuant to clauses 16.1, 16.2, 16.4 and 16.5;

"Acquired WIP" has the meaning given to such term in paragraph 3.1 of schedule 20 (Termination Payments);

"ACS Date" means each of the First ACS Date, the Second ACS Date and the Third ACS Date in respect of each type of ACS/Overhaul Component;

"ACS/Overhaul Component" means each Part which has a maintenance interval of three years or more as described and set out in the Train Maintenance Regime (including the Train Maintenance Plan);

"ACS Services" means the performance of asset condition surveys and related repair and/or replacement activities in respect of each type of ACS/Overhaul Component, as is more particularly described in paragraph 8 of part B of schedule 1 (The Services) of the FSA;

"Act" means the Railways Act 1993;

"Additional Infrastructure Information" has the meaning given to such term in clause 8.4(a)(iii) (Documentation);

"Adjudicator" has the meaning given to such term in paragraph 4.3 of schedule 19 (Dispute Resolution Procedure);

"Advance Payment Bond" means an Advance Payment Bond issued by an Advance Payment Bond Provider in the form set out in Appendix 1 to Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);

"Advance Payment Bond Provider" means a financial institution providing an Advance Payment Bond in accordance with the requirements of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);

"Affiliate" means in relation to any person, any Holding Company or subsidiary of that person or any subsidiary of such Holding Company and subsidiary is to be construed in accordance with section 1159 of the Companies Act 2006, save that for the purposes of determining whether one entity is an Affiliate of another any transfer of shares by way of security or to a nominee of the transferor shall be disregarded;

"Agreed Forward Rates" means the forward rates which are agreed between the Purchaser and the Manufacturer at the time that the relevant Base Order Option, Whole Line Option or WLO Additional Trains Change is exercised (or, failing agreement, are reasonably determined by the Purchaser) and which are used to calculate:

- (a) the Base Order Option Price; and/or
- (b) the WLO Additional Trains Option Price,

as the case may be, so that each can be denominated in pounds sterling;

"Agreement" means this Agreement including the schedules;

"ALARP" has the meaning given to such term in paragraph 16.1 of schedule 17 (Design Management);

"Alternative Supplier" has the meaning given to such term in paragraph 2.2(a) of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);

"APB Bond Amount" means, in respect of each Advance Payment Bond from time to time, the maximum amount that may be demanded under that Advance Payment Bond at such time;

"APB Provider Downgrade" means the long-term credit rating of the Advance Payment Bond Provider falls below "A" from Standard and Poor's Rating Services or the equivalent of "A" from any of the entities of equivalent international reputation that provide a long-term credit rating for the Advance Payment Bond Provider;

"APB Step-Down Date" has the meaning given to such term in paragraph 1.4 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);

"Applicable Laws and Standards" means, as the context may require, all or any Laws and Applicable Standards at any time or from time to time in force in the United Kingdom or the European Union and which are or may become applicable to this Agreement, any agreement or document referred to herein, any Purchased Item, the Training Services and/or the Manufacturer's obligations (including their performance) under this Agreement including, without prejudice to the generality of the foregoing, the requirements of the ORR, Environmental Laws, HSWA and ROGS;

"Applicable Standards" means:

- (a) the Specified Standards; and
- (b) all other Standards (but excluding LUL Standards) which apply to this Agreement, any agreement or document referred to in this Agreement, any Purchased Item, the Training Services and/or the Manufacturer's obligations (including their performance) under this Agreement and with which the Manufacturer should comply under Good Industry Practice, in each case to the extent that they do not conflict with the Specified Standards;

"Approval" means approval given by the Purchaser in accordance with the process set out in Appendix 2 to schedule 5 (Contract Management) and **"Approval Process"** shall be construed accordingly;

"Approved Party" has the meaning given to such term in clause 5.1(b);

"As New Condition" means that the aesthetic condition (including branding) of:

- (a) the exterior of the Train is clean, has no corrosion, chips, scratches or dents, has no colour discolouration or fading, no labelling is missing, damaged or defaced and is free from Graffiti; and
- (b) the interior of the Train is clean with no chewing gum, litter or detritus, is free from Graffiti, has no colour discolouration or fading, has no corrosion, chips, scratches or dents, the flooring has no delamination, bubbles or ripples, no labelling is missing, damaged or defaced, all fixtures and fittings, arm rests and hand rails are in place, intact and in good condition and all seats are in as new condition with no detached or otherwise damaged or displaced upholstery;

"Assurance" means the provision of evidence given to the Purchaser for each Assurance Stage to demonstrate that the requirements defined in this Agreement are being and have been fully realised and Approval granted by the Purchaser, all in accordance with the procedure described in schedule 6 (Assurance) and **"Assure"** and **"Assured"** shall be construed accordingly;

"Assurance Period" means the period from the Commencement Date until the date of Approval of Assurance Stage 6 or as otherwise agreed between the Parties;

"Assurance Plan" has the meaning given to such term in paragraph 9.1(f) of schedule 5 (Contract Management);

"Assurance Regime" means the regime for Progressive Assurance provided or to be provided by the Manufacturer to the Purchaser in relation to the Manufacturer's performance of its obligations under this Agreement as set out in schedule 6 (Assurance);

"Assurance Stage" means each of the Assurance Submission stages described in paragraph 3.4 of schedule 6 (Assurance) and any additional stages identified by the Manufacturer;

"Assurance Submission" means the submission made by the Manufacturer for each Assurance Stage in accordance with schedule 6 (Assurance);

"Authorisation" has the meaning given to such term in paragraph 2.1 of schedule 5 (Contract Management) and Authorised shall be construed accordingly;

"Automatic Lineside Inspection Equipment" means the equipment described as such in the Train Technical Specification (in particular in Section 21.1 thereof) which is to be installed by the Purchaser at the relevant Designated Depot;

"AWE" means the Average Weekly Earnings: K5AE – manufacturing engineering and allied industries (excluding bonuses) index published on a monthly basis by the Office of National Statistics;

"Bakerloo Line Additional Cab Conversion Unit" means any supplementary WLO Cab Conversion Unit supplied or to be supplied by the Manufacturer pursuant to the exercise of a WLO Additional Trains Option Notice pursuant to clause 6.7(b)(iv);

"Bakerloo Line Additional Train" means each one of a maximum of 5 additional Bakerloo Line Trains supplied or to be supplied by the Manufacturer pursuant to the exercise of a WLO Additional Trains Option Notice pursuant to clause 6.7(b)(i) and **"Bakerloo Line Additional Trains"** shall be construed accordingly;

"Bakerloo Line Base Order" means the items supplied or to be supplied by the Manufacturer for the purposes of the Whole Line Option exercised in relation to the Bakerloo Line, comprising the items listed in paragraph 4.1(a) of schedule 25 (Whole Line Options) as amended by the Purchaser in the relevant Whole Line Option Notice;

"Bakerloo Line Cab Conversion Unit" means the equipment to enable the Purchaser to convert both of the driving cabs on any Bakerloo Line Train to usable passenger space as required by Section 6.1 of the Train Technical Specification;

"Bakerloo Line Equipment" means:

- (a) two (2) Train Driving Simulators;
- (b) the Bakerloo Line Warranty Spares;
- (c) the Bakerloo Line Purchaser Fault Spares;
- (d) the Bakerloo Line Maintenance Spares;
- (e) the Bakerloo Line Special Tools;
- (f) the Bakerloo Line Non-Standard Tools;
- (g) one (1) Bakerloo Line Saloon Mock-up;
- (h) the OTC - Infrastructure-Borne Equipment for the Bakerloo Line;
- (i) one (1) Bakerloo Line Cab Conversion Unit; and

(j) one (1) set of Automatic Lineside Inspection Equipment;

"Bakerloo Line Extension" means TfL's proposals for extending the Bakerloo Line further into southeast London from its current end point at Elephant & Castle;

"Bakerloo Line Extension Train" means each Bakerloo Line Train supplied or to be supplied by the Manufacturer for the purposes of the Bakerloo Line Extension pursuant to the exercise of a WLO Additional Trains Option Notice in accordance with clause 6.7(b)(ii) and **"Bakerloo Line Extension Trains"** shall be construed accordingly;

"Bakerloo Line Maintenance Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the Purchaser to carry out routine maintenance on the Bakerloo Line Trains and Bakerloo Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Bakerloo Line Spares) of Appendix 5 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Bakerloo Line Maintenance Spare"** shall mean any one of them;

"Bakerloo Line Non-Standard Tools" means those tools that are readily available from tool retailers which are not listed in LU reference document DTP-UIP1973-1.5-RPT-00048 "Depot Standard Tooling List" including all of the items listed in Part C: of Appendix 5 to schedule 25 (Whole Line Options) for the Bakerloo Line Base Order as amended pursuant to the process in clause 6.10(g) and **"Bakerloo Line Non-Standard Tool"** shall mean any one of them;

"Bakerloo Line Purchaser Depot Works" means the Purchaser Depot Works in relation to the Bakerloo Line set out in Part A: of Appendix 1 to schedule 25 (Whole Line Options);

"Bakerloo Line Purchaser Fault Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the rectification of Purchaser Faults on the Bakerloo Line Trains and Bakerloo Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Bakerloo Line Spares) of Appendix 5 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Bakerloo Line Purchaser Fault Spare"** shall mean any one of them;

"Bakerloo Line Saloon Mock-up" means the mock-up of the saloon of a Bakerloo Line Train, to be delivered by the Manufacturer in accordance with the Train Technical Requirements and the terms of this Agreement (including clause 10.4 as amended by schedule 25 (Whole Line Options)) which meets all applicable requirements of the Train Technical Specification;

"Bakerloo Line Spares" means the Bakerloo Line Warranty Spares, the Bakerloo Line Purchaser Fault Spares and the Bakerloo Line Maintenance Spares and **"Bakerloo Line Spare"** shall mean any one of them;

"Bakerloo Line Special Tools" means those tools which are not readily available from generally available tool suppliers and include, but are not limited to, all of the items listed in Part B: (Bakerloo Line Special Tools) of Appendix 5 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Bakerloo Line Special Tool"** shall mean any one of them;

"Bakerloo Line Train" means each Train supplied or to be supplied under this Agreement for the Bakerloo Line (on exercise of the relevant Whole Line Option) which complies with all of the general requirements of the Train Technical Requirements together with all of the specific requirements for the Bakerloo Line set out in the Train Technical Requirements and, except where expressly excluded, includes a Bakerloo Line Additional Train;

"Bakerloo Line Training Services" means those training services provided or to be provided by the Manufacturer in relation to the Whole Line Option exercised in relation to the Bakerloo Line pursuant to clause 12 (Training Services) as amended by schedule 25 (Whole Line Options) and as set out in the Training Programme for that Whole Line Option;

"Bakerloo Line Warranty Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the carrying out of warranty work on the Bakerloo Line Trains and Bakerloo Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: of Appendix 5 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Bakerloo Line Warranty Spare"** shall mean any one of them;

"Base Order" has the meaning given to such term in clause 6.1;

"Base Order Cab Conversion Unit" means the equipment to enable the Purchaser to convert both of the driving cabs on any Base Order Train to usable passenger space as required by Section 6.1 of the Train Technical Specification;

"Base Order Equipment" means:

- (a) four (4) Train Driving Simulators;
- (b) the Base Order Warranty Spares;
- (c) the Base Order Purchaser Fault Spares;
- (d) the Base Order Maintenance Spares;
- (e) the Base Order Special Tools;
- (f) the Base Order Non-Standard Tools;
- (g) one (1) Base Order Saloon Mock-up;
- (h) the TCMS Simulator;
- (i) the OTC - Infrastructure-Borne Equipment for the Base Order;
- (j) one (1) Base Order Cab Conversion Unit; and
- (k) one (1) set of Automatic Lineside Inspection Equipment;

"Base Order Maintenance Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the Purchaser to carry out routine maintenance on the Base Order Trains and Base Order Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Base Order Spares) of schedule 8 (Spares and Special Tools) and **"Base Order Maintenance Spare"** shall mean any one of them;

"Base Order Non-Standard Tools" means those tools that are readily available from tool retailers which are not listed in LU reference document DTP-UIP1973-1.5-RPT-00048 "Depot Standard Tooling List" including all of the items listed in Part C: (Base Order Non-Standard Tools) of schedule 8 (Spares and Special Tools) and **"Base Order Non-Standard Tool"** shall mean any one of them;

"Base Order Option" means any of the options exercisable by the Purchaser in relation to the Base Order contained in clause 6.6;

"Base Order Option Cab Conversion Unit" means any supplementary Base Order Cab Conversion Unit supplied or to be supplied by the Manufacturer pursuant to the exercise of a Base Order Option by the Purchaser in accordance with clause 6.6(a);

"Base Order Option Notice" means a notice on the terms set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser to the Manufacturer to procure Base Order Option Trains, Option Train Driving Simulators and/or Base Order Option Cab Conversion Units pursuant to clause 6.6(a);

"Base Order Option Price(s)" means the prices in respect of each Base Order Option as set out in Part C: (Base Order Options for supply of further Trains and Equipment) of schedule 10 (Milestones and Security);

"Base Order Option Spares" means supplementary Base Order Spares supplied or to be supplied by the Manufacturer pursuant to the exercise of a Base Order Option by the Purchaser in accordance with clauses 6.6(a) or 6.6(b);

"Base Order Option Spares/Special Tools Notice" means a notice on the terms set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser to the Manufacturer to procure Base Order Option Spares and/or Base Order Option Special Tools required pursuant to clause 6.6(b);

"Base Order Option Special Tools" means supplementary Base Order Special Tools supplied or to be supplied by the Manufacturer pursuant to the exercise of a Base Order Option by the Purchaser in accordance with clause 6.6(b);

"Base Order Option Train" means additional Base Order Trains supplied or to be supplied by the Manufacturer pursuant to the exercise of a Base Order Option by the Purchaser in accordance with clause 6.6(a);

"Base Order Option Train Change" means a Purchaser Change which requires Base Order Option Trains, Option Train Driving Simulators, Base Order Option Spares and/or Base Order Option Cab Conversion Units to be manufactured, tested, commissioned and delivered in accordance with the terms of this Agreement;

"Base Order Purchaser Fault Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the rectification of Purchaser Faults on the Base Order Trains and Base Order Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Base Order Spares) of schedule 8 (Spares and Special Tools) and **"Base Order Purchaser Fault Spare"** shall mean any one of them;

"Base Order Saloon Mock-up" means the mock-up of the saloon of a Base Order Train, to be delivered by the Manufacturer in accordance with the Train Technical Requirements and the terms of this Agreement (including clause 10.4) as further described in Section 1.9.1 of the Train Technical Specification;

"Base Order Spares" means the Base Order Warranty Spares, the Base Order Purchaser Fault Spares and the Base Order Maintenance Spares for the Trains and Equipment and **"Base Order Spare"** shall mean any one of them;

"Base Order Special Tools" means those tools which are not readily available from generally available tool suppliers and include, but are not limited to, all of the items listed in Part B: (Base Order Special Tools) of schedule 8 (Spares and Special Tools) and **"Base Order Special Tool"** shall mean any one of them;

"Base Order Train" means each Train supplied or to be supplied under this Agreement for the Piccadilly Line which complies with all of the general requirements of the Train Technical Requirements together with all of the specific requirements for the Piccadilly

Line set out in the Train Technical Requirements and, except where expressly excluded, includes a Base Order Option Train;

"Base Order Training Services" means those training services provided or to be provided by the Manufacturer in relation to the Base Order pursuant to clause 12 (Training Services) as set out in the Training Programme;

"Base Order Warranty Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the carrying out of warranty work on the Base Order Trains and Base Order Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Base Order Spares) of schedule 8 (Spares and Special Tools) and **"Base Order Warranty Spare"** shall mean any one of them;

"Bid Maintenance Cost" means the cost of maintenance by the Purchaser of a Train in accordance with the Train Maintenance Regime for each relevant Fleet, being:

(a) for the Base Order Fleet, [REDACTED]

(b) for the Bakerloo Line Fleet, [REDACTED]

(c) for the Central Line Fleet, [REDACTED]

(d) for the Waterloo & City Line Fleet, [REDACTED]

"Bill of Materials" means the document provided or to be provided by the Manufacturer in accordance with the terms of this Agreement, substantially in the form set out in Part D: of schedule 8 (Spares and Special Tools) for the Base Order and in the form set out in Part D: of Appendices 5, 6 or 7 of schedule 25 (Whole Line Options) for the relevant Whole Line Option, and which shall include:

- (a) a description of each Part, Spare, Consumable, Special Tool and Non-Standard Tool;
- (b) quantity;
- (c) minimum order quantities required for Consumables;
- (d) price per Part, Spare, Special Tool, Non-Standard Tool and price per relevant quantity of Consumables;
- (e) part number;
- (f) warranty period; and
- (g) lead time for purchase after the initial build period,

and **"Bakerloo Line Bill of Materials"**, **"Central Line Bill of Materials"** and **"Waterloo & City Line Bill of Materials"** shall be construed accordingly;

"Bond Event" means:

- (a) an Insolvency Event of the Advance Payment Bond Provider;
- (b) an Advance Payment Bond ceases to be in full force and effect; or
- (c) the Advance Payment Bond Provider's obligations under an Advance Payment Bond are or become wholly or partly invalid or unenforceable;

"British Standards" means those standards produced by the British Standards Institution of 389 Chiswick High Road, London, United Kingdom;

"Business Hour(s)" means any hour on which banks are open for domestic business in the City of London;

"CAHA" means the railway industry claims allocation and handling agreement pursuant to which liability for applicable third party claims is allocated;

"Capital Expenditure" means any expenditure which is treated as capital expenditure in accordance with generally accepted accounting principles in the United Kingdom from time to time;

"CCSO" means the Case for Continued Safe Operation, as further described in paragraph 10 of schedule 6 (Assurance) and referred to in clause 10.2(c);

"CCTV System" means the train-carried CCTV system for the Trains, as further described in Section 11 of the Train Technical Specification;

"Central Line Additional Cab Conversion Unit" means any supplementary WLO Cab Conversion Unit supplied or to be supplied by the Manufacturer pursuant to the exercise of a WLO Additional Trains Option Notice pursuant to clause 6.7(b)(iv);

"Central Line Additional Train" means each one of a maximum of 24 additional Central Line Trains supplied or to be supplied by the Manufacturer pursuant to the exercise of a WLO Additional Trains Option Notice pursuant to clause 6.7(b)(i) and **"Central Line Additional Trains"** shall be construed accordingly;

"Central Line Base Order" means the items supplied or to be supplied by the Manufacturer for the purposes of the Whole Line Option exercised in relation to the Central Line, comprising the items listed in paragraph 4.1(b) of schedule 25 (Whole Line Options) as amended by the Purchaser in the relevant Whole Line Option Notice;

"Central Line Cab Conversion Unit" means the equipment to enable the Purchaser to convert both of the driving cabs on any Central Line Train to usable passenger space as required by Section 6.1 of the Train Technical Specification;

"Central Line Equipment" means:

- (a) four (4) Train Driving Simulators;
- (b) the Central Line Warranty Spares;
- (c) the Central Line Purchaser Fault Spares;
- (d) the Central Line Maintenance Spares;
- (e) the Central Line Special Tools;
- (f) the Central Line Non-Standard Tools;
- (g) one (1) Central Line Saloon Mock-up;
- (h) the OTC - Infrastructure-Borne Equipment for the Central Line;
- (i) one (1) Central Line Cab Conversion Unit; and
- (j) one (1) set of Automatic Lineside Inspection Equipment;

"Central Line Maintenance Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the Purchaser to carry out routine maintenance on the Central Line Trains and Central Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Central Line Spares) of Appendix 6 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Central Line Maintenance Spare"** shall mean any one of them;

"Central Line Non-Standard Tools" means those tools that are readily available from tool retailers which are not listed in LU reference document DTP-UIP1973-1.5-RPT-00048 "Depot Standard Tooling List" including all of the items listed in Part C: of Appendix 6 to schedule 25 (Whole Line Options) for the Central Line Base Order as amended pursuant to the process in clause 6.10(g), and **"Central Line Non-Standard Tool"** shall mean any one of them;

"Central Line Purchaser Depot Works" means the Purchaser Depot Works in relation to the Central Line set out in Part B: (Central Line Purchaser Depot Works) of Appendix 1 to schedule 25 (Whole Line Options);

"Central Line Purchaser Fault Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the rectification of Purchaser Faults on the Central Line Trains and Central Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Bakerloo Line Spares) of Appendix 5 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Central Line Purchaser Fault Spare"** shall mean any one of them;

"Central Line Saloon Mock-up" means the mock-up of the saloon of a Central Line Train, to be delivered by the Manufacturer in accordance with the Train Technical Requirements and the terms of this Agreement (including clause 10.4 as amended by schedule 25 (Whole Line Options)) as further described in Section 1.9 of the Train Technical Specification;

"Central Line Spares" means the Central Line Warranty Spares, the Central Line Purchaser Fault Spares and the Central Line Maintenance Spares and **"Central Line Spare"** shall mean any one of them;

"Central Line Special Tools" means those tools which are not readily available from generally available tool suppliers and include, but are not limited to, all of the items listed in Part B: (Base Order Special Tools) of Appendix 6 to schedule 25 (Whole Line Options) as varied for the Central Line Base Order following the process in clause 6.10(g) and **"Central Line Special Tool"** shall mean any one of them;

"Central Line Train" means each Train supplied or to be supplied under this Agreement for the Central Line (on exercise of the relevant Whole Line Option) which complies with all of the general requirements of the Train Technical Requirements together with all of the specific requirements for the Central Line set out in the Train Technical Requirements and, except where expressly excluded, includes a Central Line Additional Train;

"Central Line Training Services" means those training services provided or to be provided by the Manufacturer in relation to the Whole Line Option exercised in relation to the Central Line pursuant to clause 12 (Training Services) as amended by schedule 25 (Whole Line Options) and as set out in the Training Programme for that Whole Line Option;

"Central Line Warranty Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the carrying out of warranty work on the Central Line Trains and Central Line Equipment for the whole of the Train Warranty Period in

accordance with the Train Maintenance Regime as described in Part A: of Appendix 5 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Central Line Warranty Spare"** shall mean any one of them;

"Certificate of Commencement" means the certificate issued by the Purchaser in relation to the Base Order or each Whole Line Option, as appropriate, in the form or substantially in the form set out in schedule 21 (Pro Forma Certificates);

"Certificate of Conformance" means a certificate delivered by the Manufacturer to the Purchaser with Further Equipment which warrants that the Further Equipment delivered conforms in every way with the First-in-Class Equipment which was Equipment Accepted by the Purchaser in accordance with clause 15.24;

"Certificate of Technical Conformance" means a certificate issued by the Purchaser which records that the Train to which the certificate relates (or part of that Train, as the case may be) conforms with the relevant Train Technical Requirements;

"Change" means a change (whether by addition, amendment, substitution, omission or otherwise) of whatever nature to this Agreement including to:

- (a) any of the Train Technical Requirements;
- (b) the Trains or any item of Equipment; or
- (c) any term of this Agreement;

"Change Appraisal" means any written report delivered by the Manufacturer in accordance with paragraph 4.1 of Part B: (Purchaser Changes) of schedule 12 (Change Procedure) and containing the information specified in paragraph 4.2 of Part B: of schedule 12;

"Change Appraisal Instruction" means a written notification provided by the Purchaser pursuant to paragraph 3.3 of Part B: (Purchaser Changes) of schedule 12 (Change Procedure) and containing the information specified in paragraph 3.5 of Part B: of schedule 12;

"Change Confirmation Notice" means a notice issued (and counter-signed as appropriate) by the Purchaser to the Manufacturer pursuant to paragraph 3.6 or 5.4(a) of Part B: (Purchaser Changes) of schedule 12 (Change Procedure) instructing the Manufacturer to proceed with the implementation of a Change or part of a Change in accordance with paragraph 6 (Implementation of Purchaser Change) of Part B: of schedule 12;

"Change in Costs" means in respect of any Relevant Event, the effect of that Relevant Event (whether of a one-off or recurring nature, and whether positive or negative) upon the actual or anticipated costs, losses or liabilities of the Manufacturer (without double counting), including, as relevant, the following:

- (a) the reasonable costs of complying with the requirements of clauses 17 (Relief Events and Compensation Events) and 28 (Change in Law) and/or Part B: (Purchaser Changes) or Part D: (Compensation Changes) (save where these parts have an alternative mechanism for dealing with such costs) of schedule 12 (Change Procedure), including the reasonable costs of preparation of design and estimates;
- (b) the costs of employing additional staff;
- (c) the effects of costs on implementation of any insurance reinstatement in accordance with this Agreement, including any adverse effect on the insurance proceeds payable to the Manufacturer (whether arising from physical damage

insurance (or its equivalent)) in respect of that insurance reinstatement and any extension of the period of implementation of the insurance reinstatement;

- (d) Capital Expenditure;
- (e) any deductible or increase in the level of deductible, or any increase in premium under or in respect of any insurance policy;
- (f) Direct Losses; and
- (g) the margin to be earned by the Manufacturer (as determined in accordance with Appendix 3 (Manufacturer's Margin) to schedule 12 (Change Procedure),

provided that all costs other than limb (g) above shall be calculated in accordance with the principles set out in Appendix 2 (Calculation of Change in Costs) to schedule 12 (Change Procedure);

"Change in Law" means the coming into effect after the date of this Agreement of:

- (a) Legislation (whether by means of any enactment, repeal or amendment), other than Legislation which on or before the date of this Agreement has been published in substantially the same form or with substantially the same effect as the relevant Legislation finally takes when it has legal effect:
 - (i) in a draft Bill as a part of a government department consultation paper;
 - (ii) in a Bill;
 - (iii) in a draft statutory instrument; or
 - (iv) published as a proposal in the Official Journal of the European Union or as a Common Position adopted by the European Parliament;
- (b) any Applicable Standards; or
- (c) any applicable judgment of a relevant court of law made after the date of this Agreement which creates or changes a binding precedent,

which in any such case affects the Purchaser, TfL, the Manufacturer, any Purchased Item or the LUL Network;

"Change of Control" means if a person (or persons acting in concert) who directly or indirectly controls the Manufacturer (or any person having a direct or indirect interest in the Manufacturer) as at the date of this Agreement ceases to do so or if a person (or persons acting in concert) obtains directly or indirectly control of the Manufacturer (or any person having a direct or indirect interest in the Manufacturer) after the date of this Agreement and control for the purposes of this definition means:

- (a) the holding and/or possession of the legal or beneficial interest in, and/or the ability to exercise the majority of the voting rights applicable to, shares or securities of the Manufacturer (or any person having a direct or indirect interest in the Manufacturer) by the relevant person (or persons acting in concert); or
- (b) the power of the relevant person (or persons acting in concert) (directly or indirectly) to secure that the business and/or affairs and/or policies of the Manufacturer (or any person who has a direct or indirect interest in the Manufacturer) are conducted in accordance with the wishes of that person (or persons); or

- (c) the right of the relevant person (or persons acting in concert) to receive (directly or indirectly) on a winding up the greater part of the assets of the Manufacturer (or any person having a direct or indirect interest in the Manufacturer) which are available for distribution;

"Change Procedure" means the procedure for implementing Changes set out in schedule 12 (Change Procedure);

"Claim Appraisal" means any written report delivered by the Manufacturer in accordance with paragraph 3.1 of Part D: (Compensation Changes) of schedule 12 (Change Procedure) and containing the information specified in paragraph 3.2 of Part D: of schedule 12;

"Claim Appraisal Instruction" means a written notification provided by the Purchaser pursuant to paragraph 2.1 of Part D: (Compensation Changes) of schedule 12 (Change Procedure) and containing the information specified in paragraph 2.2 of Part D: of schedule 12;

"Claim Confirmation Notice" means a notice issued by the Purchaser pursuant to paragraph 2.1 or 4.4 of Part D: (Compensation Changes) of schedule 12 (Change Procedure), setting out the agreed or determined position in respect of a Compensation Event;

"Commencement Date" means, in respect of the Base Order, the date specified as the date this Agreement becomes fully effective pursuant to clause 2.2 and, in relation to each Whole Line Option, the date such Whole Line Option becomes fully effective, in each case as set out in the relevant Certificate of Commencement;

"Compensation Event" means any of the following events:

- (a) the Purchaser's failure to comply with or delay in complying with its obligations to (i) serve notices or documents pursuant to clause 7.9(a) and (ii) pass to the Manufacturer copies of notices received pursuant to clause 7.9(c);
- (b) the Purchaser's failure to install or procure the installation of, or delay in, installing the OTC – Infrastructure-Borne Equipment in accordance with clause 7.16(a)(i);
- (c) the Purchaser's failure to install or procure the installation of, or delay in, installing the Automatic Lineside Inspection Equipment at the relevant Designated Depot in accordance with clause 7.16(b)(i);
- (d) the Purchaser's failure to submit or delay in submitting the applications referred to in clause 11.2(d);
- (e) the Purchaser's failure to carry out or procure or delay in carrying out or procuring those things in relation to Route Acceptance required by clause 11.4(b);
- (f) the Purchaser's failure to procure the fitment of the Test Track Facilities Integration Equipment in circumstances where the Purchaser has not waived (either in whole or in part, permanently or temporarily) the requirement to test the Trains using the Test Track Facilities Integration Equipment at the Test Track Facilities in accordance with clause 14.2(a)(iv);
- (g) the Purchaser's failure to provide operators for testing in accordance with clause 14.2(e)(ii) and paragraph 10.5(b)(ii) of Part A: (Testing and Inspection Requirements) of schedule 7 (Testing and Inspection);
- (h) the Purchaser's failure to make available access to the applicable Designated Depot by the dates set out in the Key Programme Dates for the purposes of Provisional

Acceptance of a Train where required pursuant to clause 15.1(d) on the basis set out in clause 15.3(b) (except to the extent that the Manufacturer has failed to comply with its obligations in clause 7.11 in relation to the Manufacturer Depot Warranty Works);

- (i) the Purchaser's failure to procure the fitment of the Pre-Specified Free Issue Materials in accordance with clause 23.1(a);
- (j) the Purchaser's breach of its obligations contained in clause 38.2 in respect of confidentiality;
- (k) the Purchaser's failure to give the Manufacturer the required notice pursuant to clause 45.1(e);
- (l) the Purchaser's failure to provide the access required for LUL Network Testing in accordance with clause 14.2(a)(i) and paragraph 10.5(b)(i) of Part A: (Testing and Inspection Requirements) of schedule 7 (Testing and Inspection);
- (m) the Purchaser's failure to act as Lead PDP in the circumstances set out in paragraph 2.2(b) of schedule 26 (Systems Integration);
- (n) the Purchaser's failure to act as Participating PDP in the circumstances set out in paragraph 2.2(c) of schedule 26 (Systems Integration);
- (o) the Purchaser's failure to procure the production of an ICD by a Lead PDP in accordance with paragraphs 2.2(i)(iii) and 2.2(i)(iv) of schedule 26 (Systems Integration);
- (p) subject to the terms of clause 28 (Change in Law), a Qualifying Change in Law;
- (q) the issue of a Suspension Notice by the Purchaser in accordance with clause 36.2, on the basis set out in clause 36.2; and
- (r) any failure of any Participating PDP relating to Power Distribution and Substations for the purposes of the Manufacturer performing its obligations relating to the interfaces as set out in Appendix 1 of schedule 26 (Systems Intergration),

except to the extent that any of the events listed above arises (directly or indirectly) as a result of any breach, wilful default or wilful act of the Manufacturer, the Service Provider or any of its Subcontractors, and provided that each of the events above shall be subject to the provisions of the relevant clause(s);

"Competent Authority" means any legislative, judicial, regulatory or administrative body or agency (or any subdivision of them) of the United Kingdom or the European Union or any supranational body which has rule-making power or whose directions, instructions, rulings, laws or regulations are directly enforceable against a Party in connection with the performance of this Agreement (including, for the avoidance of doubt, the Purchaser, in its capacity as Infrastructure Manager, and Network Rail);

"Competitor" means any person conducting large-scale manufacturing of rolling stock and supply of such rolling stock in or into the United Kingdom and who directly competes with the Manufacturer in the United Kingdom in such business;

"Component Life Warranty" means, in respect of each Major Component, the corresponding warranty period set out in column 2 of the table in clause 20.2;

"Component Overhaul Option" means the option for the Purchaser to require the Manufacturer to carry out an overhaul of each ACS/Overhaul Component or type of ACS/Overhaul Component in the manner specified for that type of ACS/Overhaul

Component in the Train Maintenance Regime, at the price specified in Appendix 7 of schedule 11 of the FSA, as is more particularly described in paragraph 9 of Part B of schedule 1 (The Services) of the FSA;

"Concept Design" means the concept design of the Trains and Equipment for the Base Order and the production of each of the items described in paragraph 6 of schedule 17 (Design Management);

"Concept Design Phase" means the period commencing on the Commencement Date and ending on the date of Approval of the Concept Design Submission for the Base Order pursuant to schedule 17 (Design Management);

"Concept Design Submission" means the submission of Train and Equipment Design information for the Base Order in accordance with paragraph 6 of schedule 17 (Design Management);

"Confidential Information" means information of a technical, commercial or financial nature received from a Party to this Agreement or its agents, representatives or advisers including information received by the Manufacturer from the Purchaser, TfL or its Affiliates;

"Consumables" means single use items that are routinely used in maintenance activities which wear out or are otherwise depleted and cannot be repaired;

"Contract Manager(s)" means either or both, as the case may be, of the Purchaser Contract Manager and/or the Manufacturer Contract Manager;

"Contract Price" means:

- (a) in relation to a Train forming part of the Base Order, the price to be paid in respect of such Train as set out in Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security);
- (b) in relation to any Purchased Items forming part of the Base Order (other than the Trains), the price to be paid in respect of such Purchased Items as set out in Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10;
- (c) in relation to any Base Order Option Train Change, the Base Order Option Price to be paid in respect of that Base Order Option Train Change in accordance with clause 6.6 (Base Order Options);
- (d) in relation to a WLO Train forming part of a WLO Base Order the price to be paid in respect of such Train as set out in the relevant table in Appendix 3 to schedule 25 (Whole Line Options);
- (e) in relation to any WLO Purchased Items forming part of the WLO Base Order (other than the Trains), the price to be in respect of such WLO Purchased Items as set out in the relevant table in Appendix 3 to schedule 25 (Whole Line Options); and
- (f) in relation to any WLO Additional Trains Change, the WLO Additional Trains Option Price to be paid in respect of that WLO Additional Trains Change in accordance with Table 1 of paragraph 1, 2 or 3 of Appendix 4 to schedule 25 (Whole Line Options),

as the same may be amended, supplemented or varied from time to time pursuant to the Change Procedure, together in each case with any VAT chargeable in accordance with clause 25.2;

"Contract Year" means each 12-month period starting on 1 April with the exception of the first Contract Year which shall commence on the Commencement Date and end on 31 March first occurring thereafter (the **"First Contract Year"**);

"Contractual Acceptance Date" means:

- (a) in relation to a Train forming part of the Base Order or a WLO Base Order, the intended date of issue of a Provisional Acceptance Certificate for such Train as set out in the relevant Key Programme Dates;
- (b) in relation to a Fleet, the intended date of issue of the Fleet Acceptance Certificate (excluding any Base Order Option Trains or WLO Additional Trains as the case may be, unless the Contractual Fleet Acceptance Date has been amended to accommodate any such Base Order Option Trains or WLO Additional Trains) as set out in the relevant Key Programme Dates;
- (c) in relation to a Train Driving Simulator or item of First-in-Class Equipment, the intended date of issue of an Equipment Acceptance Certificate; and
- (d) in relation to a Base Order Option Train Change or WLO Additional Trains Change the intended date for the item which is the subject of the Base Order Option or the WLO Additional Trains Option Notice to be Accepted by the Purchaser as set out in the relevant Key Programme Dates;

in each case as may be amended, supplemented or varied from time to time in accordance with this Agreement;

"Contractual Final Acceptance Date" means the intended date for Final Acceptance of each Train as set out in the relevant Key Programme Dates;

"Contractual Fleet Acceptance Date" means the date for Fleet Acceptance set out in the relevant Key Programme Dates;

"Contractual Provisional Acceptance Date" means in relation to a Train forming part of the Base Order, the intended date of issue of a Provisional Acceptance Certificate for such Train as set out in the relevant Key Programme Dates;

"Conventional Cooling" means the saloon HVAC system described in the Train Technical Requirements;

"Corporate IPRs" means the IPR owned by, or licensed to, the TfL Group described in Part B: (Corporate IPR) of schedule 23 (Intellectual Property) together with the standards specified in relation to the colour, sizing, quality, etc. of any logo or branding referred to in LUL Standard 1-382;

"Corrective Action" has the meaning given to such term in clause 9.8(a);

"Couplers" means the device for coupling a Train to an existing train for the purpose of recovery, as more fully described in Section 16.5 of the Train Technical Specification;

"Court" has the meaning given to such term in paragraph 5.1 of schedule 19 (Dispute Resolution Procedure);

"CPD Health, Safety and Environmental Strategy" means the Purchaser's Capital Programmes Directorate Health, Safety and Environmental Strategy 2014-2017 set out in Appendix 4 to schedule 16 (Health, Safety and Environment) as updated from time to time;

"Customer Acceptance Testing" means the tests carried out in accordance with paragraph 6 of schedule 7 (Testing and Inspection);

"Customer Acceptance Testing Standard" means LUL Standard S1321 A4 "Customer Acceptance Testing";

"Data Subject" has the meaning given to such term in the European DP Legislation;

"DECC" means the Department of Energy & Climate Change;

"Declaration of Ineffectiveness" has the meaning given to such term in the Utilities Contracts Regulations;

"Deep Tube Upgrade Programme" or "DTUP" means the programme for the upgrade or replacement of railway assets on the Piccadilly Line, Bakerloo Line, Central Line and Waterloo & City Line;

"Default Interest" means interest on late payment at the Default Rate;

"Default Rate" means the Bank of England Base Rate plus one per cent;

"DEFRA" means the Department for Environment, Food & Rural Affairs;

"Delivery Depot" means:

- (a) Cockfosters Depot in relation to the Base Order;
- (b) Stonebridge Park Depot in relation to the Bakerloo Line;
- (c) West Ruislip Depot in relation to the Central Line;
- (d) Waterloo Depot in relation to the Waterloo & City Line; and/or
- (e) such other location as may be notified by the Purchaser to the Manufacturer;

"Design Authority" means the body with sufficient technical knowledge and capability to assess and assure the implementation of all works to an asset over and above those set out in the Train Maintenance Regime and which also has the authority to analyse, assess and make changes to the Train Maintenance Regime in relation to that asset;

"Design Management Plan" has the meaning given to such term in paragraph 9.1(d) of schedule 5 (Contract Management);

"Design Submission" means the submission of design evidence in relation to a part of the Train or item of Equipment;

"Designated Depot" means:

- (a) Cockfosters Depot/Northfields Depot in relation to the Base Order;
- (b) London Road Depot/Queens Park Depot/Stonebridge Park Depot in relation to the Bakerloo Line;
- (c) White City Depot/Hainault Depot/West Ruislip Depot in relation to the Central Line; and/or
- (d) Waterloo Depot in relation to the Waterloo & City Line;

"Direct Agreement" means each agreement to be entered into between each relevant Key Subcontractor on the one hand, and the Purchaser on the other, to be procured by

the Manufacturer, in a form to be approved by the Purchaser, to include warranties relating to work undertaken, Purchaser access to IPR and step-in rights, as appropriate;

"Direct Losses" means all Losses excluding Indirect Losses;

"Disclosed Data" has the meaning given to such term in clause 52.2;

"Discriminatory Change in Law" means a Change in Law:

- (a) the terms of which apply expressly to:
 - (i) the Project and not to similar projects; and
 - (ii) the Manufacturer and not to other persons; or
- (b) which specifically refers to the design, manufacturing, supply, testing, commissioning, approval or maintenance of rolling stock;

"Disposal Notice" has the meaning given to such term in clause 22.2;

"Dispute" means a dispute or difference of whatsoever nature between the Manufacturer and the Purchaser in relation to the formation, operation or interpretation of, or otherwise in connection with, or arising out of, this Agreement;

"Dispute Resolution Procedure" means the procedure for resolving Disputes or Expert Disputes set out in schedule 19 (Dispute Resolution Procedure);

"DP Legislation" means the data protection laws and regulations applicable to the use and processing of Personal Data (including the European DP Legislation and the Data Protection Act 1998);

"DRACAS" means the data recording analysis and corrective action system set out in schedule 17 (Design Management);

"DRACAS / FRACAS" means the system established in accordance with paragraph 14.1 of schedule 17;

"DTUP Hazard Log Procedure" means the Purchaser's hazard log procedure with reference NTfL-2344.2.2-LUL-REC-00002;

"DTUP System" means all or any of the people, processes and technologies required to achieve the objectives of the Deep Tube Upgrade Programme and includes any subsystems relating to the same;

"ECT Bid Cost" means the NPV of the energy consumption cost of a Train as set out in the relevant RSTEM relating to the 40-year design life of the Trains, being:

- (a) for the Base Order [REDACTED]
- (b) for the Bakerloo Line Fleet, [REDACTED]
- (c) for the Central Line Fleet, [REDACTED]
- (d) for the Waterloo & City Line Fleet, [REDACTED]

"ECT WLC Cost" means the energy consumption cost in GBP of the measured performance of a particular Train on the Test Track Facilities in accordance with paragraph 3 of Part A: of schedule 7 (Testing and Inspection);

"Emergency Change" has the meaning set out in paragraph 1.3 of Part B: (Purchaser Changes) of schedule 12 (Change Procedure);

"Emergency Change Interim Payments" has the meaning set out in paragraph 1.4(a) of Part B: (Purchaser Changes) of schedule 12 (Change Procedure);

"Energy Consumption Model" means the energy consumption elements of the relevant RSTEM;

"Energy Consumption Test" or "ECT" means a test carried out in accordance with paragraph 3 of Part A: of schedule 7 (Testing and Inspection) which calculates the cost of energy consumption of a Train thereby allowing measurement of the difference in cost between (i) the ECT WLC Cost; and (ii) the ECT Bid Cost, using:

- (a) the Manufacturer Train Proposal and the Manufacturer's design documentation; and
- (b) the Energy Consumption Model;

"Energy Technology List" means the Energy Technology List contained at: <https://etl.decc.gov.uk/etl/site/criteria.html>;

"Engineering Safety Management Plan" means the plan described in Appendix 1 (Engineering Safety Management Plan – Contents) to schedule 17 (Design Management);

"Enhanced Capital Allowances" means those allowances that are part of the capital allowances regime (specifically Sections 45A and 45H of the Capital Allowances Act 2001) with respect to expenditure incurred on energy-saving and water conserving plant and machinery, appearing on either:

- (a) the Energy Technology List (for energy saving technologies) managed on behalf of DECC by the Carbon Trust; or
- (b) the Water Technology List (for water conserving technologies) managed on behalf of DEFRA by AEA Technology,

each such list as may be updated from time to time;

"Environment" means all gases, air, vapours, liquids, water (whether above or below surface and including controlled waters as defined in section 104(1) of the Water Resources Act 1991 and within drains and sewers), land, property, surface and sub-surface soils, rocks, flora, fauna and other living organisms including man, wetlands, ecosystems and all other natural resources or part thereof including artificial or man-made buildings, structures or enclosures and electricity and human health and **"Environmental"** shall be construed accordingly;

"Environmental Damage" means any material injury or damage to the Environment resulting from the discharge, emission, escape or migration of any substance, energy, noise or vibration;

"Environmental Laws" means all Applicable Laws and Standards and all orders, regulations, ordinances, decrees or regulatory codes of practice, circulars, guidance notes and equivalent controls relating to or concerning the Environment;

"Environmental Plan" has the meaning given to such term in paragraph 1.1 of Appendix 2 (Environmental Plan) to schedule 16 (Health, Safety and Environment);

"Equipment" means the Base Order Equipment, the Bakerloo Line Equipment, the Central Line Equipment and/or the Waterloo & City Line Equipment as the case may be;

"Equipment Acceptance" means, in relation to a Train Driving Simulator or item of First-in-Class Equipment, that such item complies fully with the relevant Equipment Acceptance Criteria as evidenced by and occurring upon the issue of an Equipment Acceptance Certificate for that Train Driving Simulator or item of First-in-Class Equipment and **"Equipment Accepted"** shall be construed accordingly;

"Equipment Acceptance Certificate" means a certificate in the form or substantially in the form set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser in respect of any Train Driving Simulator or item of First-in-Class Equipment;

"Equipment Acceptance Criteria" means the criteria in clause 15.20 setting out the requirements to be satisfied in order for:

- (a) Train Driving Simulators and items of First-in-Class Equipment to achieve Acceptance; and
- (b) Further Equipment to be issued with a Certificate of Conformance;

"Equipment Acceptance Tests" means those tests to be carried out by the Manufacturer to demonstrate compliance of each item of Equipment with the relevant parts of this Agreement in accordance with schedule 7 (Testing and Inspection);

"ERU" means the emergency response unit organisation within the Purchaser responsible for, amongst other things, recovering derailed and damaged trains that can no longer move without mechanical intervention;

"Escrow Agent" means NCC Group Escrow Limited or any successor or replacement to all or any of its functions or any other escrow agent as may be notified by the Purchaser to the Manufacturer;

"Escrow Agreement" means an agreement in the form or substantially in the form set out in Part A: (Software Escrow Agreement) of schedule 23 (Intellectual Property) between the Manufacturer, the Purchaser and the Escrow Agent;

"Escrow Material" has the meaning given to such term in clause 29.12(b);

"Escrow Release Event" means a release event designated as such in the Escrow Agreement;

"European DP Legislation" means the Directive of the European Parliament of the Council 95/46/EC or, on and from 25 May 2018, the General Data Protection Regulation (Regulation (EU) 2016/679);

"European Standards" means those standards ratified by the European Committee for Standardization (CEN) of Rue de Stassart, 36, B 1050 Brussels, Belgium, the European Committee for Electrotechnical Standardization (CENELEC) of F-06921, Sophia Antipolis Cedex, France or the European Telecommunications Standards Institute (ETSI) of Rue de Stassart, 36, 1050 Brussels, Belgium;

"Exception Report" has the meaning given to such term in paragraph 7.1(d) of schedule 5 (Contract Management);

"Exchange Forward Rate Contracts" means the completion of foreign exchange forward rate contracts by the Manufacturer in accordance with the Financial Close Protocol;

"Excluded Liabilities" has the meaning given to such term in clause 37.6:

"Excluded Major Components" means:

- (a) bodyshell;
- (b) couplers;
- (c) traction gear boxes;
- (d) traction motors;
- (e) paint system;
- (f) door leaves;
- (g) gangways; and
- (h) car piping and car wiring;

"Expert Dispute" means a Dispute that has been designated by the Parties as an Expert Dispute pursuant to this Agreement, to be resolved by the procedure set out in paragraph 3 (Expert Determination) of schedule 19 (Dispute Resolution Procedure);

"Expiry Date" means, in respect of each Advance Payment Bond, the date specified as such in that Advance Payment Bond;

"Exterior Features" means those elements of the visible exterior design of the Trains (including branding, the overall shape, colours, materials, form and configuration and constituent parts thereof) that are original and distinctive (meaning not commonplace in the relevant design field);

"Fault" means in relation to a Train, item of Equipment or Part, that the Train, item of Equipment or Part is not Fault Free;

"Fault Free" means, in relation to any asset or service to be provided under this Agreement:

- (a) that it does not have a Technical Failure;
- (b) that it complies with all applicable requirements and provisions of this Agreement including the Train Technical Requirements;
- (c) that it complies with all Applicable Laws and Standards, Relevant Approvals or, to the extent that there is non-compliance with any Applicable Laws and Standards, that there is a valid derogation from such Applicable Laws and Standards;
- (d) where the item is a Train, that it is fit for operation and/or use in Unrestricted Passenger Revenue Earning Service and all Relevant Approvals have been obtained in respect of that Train; and
- (e) where the item is a Part, Spare, Consumable, and/or any Major Component, that if such Part, Spare, Consumable, and/or any Major Component is incorporated into a Train, such incorporation does not prevent such Train from complying with (a) to (d);

"Final Acceptance" means, in respect of each Train, that the Train complies with the Final Acceptance Criteria as evidenced by and occurring upon the issue of a Final Acceptance Certificate for that Train;

"Final Acceptance Certificate" means a certificate in the form or substantially in the form set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser in respect of any Train;

"Final Acceptance Criteria" means each of the criteria for issue of a Final Acceptance Certificate set out in clause 15.13;

"Final Design" means the final detailed design of the Trains and Equipment and the production of each the items described in paragraph 8 of schedule 17 (Design Management);

"Final Design Phase" means:

- (a) for the Base Order, the period commencing on the expiry of the Preliminary Design Phase; and
- (b) for each Whole Line Option, the period commencing on the delivery of the relevant Whole Line Option Notice by the Purchaser,

and in each case ending on the date of Approval of the Final Design Submission for the relevant Fleet pursuant to schedule 17 (Design Management);

"Final Design Submission" means the submission of Train and Equipment Design information in accordance with paragraph 8 of schedule 17 (Design Management);

"Financial Close Protocol" means the foreign exchange rate protocol included in Part B: (Financial Close Protocol) of schedule 24 (Foreign Exchange);

"Financial Close Spreadsheet" or **"FCS"** has the meaning given to such term in paragraph 2 of Part B: (Financial Close Protocol) of schedule 24 (Foreign Exchange);

"Financiers" means any financiers providing finance to the Owner for the purposes of the Project;

"First ACS Date" means the date on which 30 per cent of the Overhaul Interval for the relevant type of ACS/Overhaul Component has elapsed;

"First and Second Pre-PAC Trains" means the first two Trains in the relevant Fleet that achieve Pre-Provisional Acceptance before any other Trains in that Fleet;

"First Article Inspection" or **"FAI"** means those inspections carried out pursuant to paragraph 2 of schedule 7 (Testing and Inspection);

"First-in-Class Equipment" means the first item of a type of Equipment (except for any Train Driving Simulator) to be presented for and to achieve Equipment Acceptance pursuant to clause 15.20 and granted an Equipment Acceptance Certificate pursuant to clause 15.21;

"Fixed Price Quotation" means a fixed price provided by the Manufacturer to the Purchaser for any Change in Costs, which may consist of a single lump sum payment, a number of payments or a change to the Milestone Payments;

"Fleets" means all of the:

- (a) Base Order Trains;
- (b) Bakerloo Line Trains;
- (c) Central Line Trains; and
- (d) Waterloo & City Line Trains,

in each case supplied or to be supplied pursuant to this Agreement, and any one of (a) to (d) above shall be a **"Fleet"**, and **"Base Order Fleet"**, **"Bakerloo Line Fleet"**, **"Central Line Fleet"** and **"Waterloo & City Line Fleet"** shall be construed accordingly;

"Fleet Acceptance" means satisfaction of the Fleet Acceptance Criteria in relation to the relevant Fleet as evidenced by and occurring upon the issue of a Fleet Acceptance Certificate;

"Fleet Acceptance Certificate" means a certificate in the form or substantially in the form set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser in respect of the Fleet as to compliance of the Fleet with the Fleet Acceptance Criteria;

"Fleet Acceptance Criteria" means each of the criteria for issue of a Fleet Acceptance Certificate set out in clause 15.17;

"Fleet Maintenance Cost" has the meaning given to such term in clause 15.15(b);

"Fleet Support Agreement" or **"FSA"** means the agreement under which the Service Provider provides additional spares and consumables and undertakes certain technical support services in respect of the Trains dated on or around the date hereof;

"FM Affected Party" has the meaning given to such term in clause 32.2;

"FOI Information Request" means a request under the FOI Legislation for information recorded in any form held by the Purchaser or held by the Manufacturer on behalf of the Purchaser;

"FOI Legislation" means the Freedom of Information Act 2000, all regulations made under it and the Environmental Information Regulations 2004 and any amendment or re-enactment of any of them and any guidance issued by the Information Commissioner in relation to such Legislation;

"Force Majeure Event" means the occurrence after the date of this Agreement of:

- (a) act of terrorism;
- (b) war, invasion, acts of foreign enemies, hostilities, civil war, revolutions, insurrection, riots or civil unrest, earthquake; and/or
- (c) nuclear, chemical or biological contamination unless the source or cause of the contamination is the result of actions of the Manufacturer;
- (d) pressure waves caused by devices travelling at supersonic speeds; or
- (e) a Relief Event constituting a Force Majeure Event (other than as a result of the negligence or other lack of care or skill on the part of the affected party, its staff, its employees, its agents, its sub- contractors or its suppliers),

save to the extent that such event is caused by the Manufacturer, any Subcontractor, or their respective agents, officers and/or employees;

"Foreign Exchange Adjusted Base Order Option Price" means the Base Order Option Price as adjusted in accordance with the formula set out in paragraph 1.1 of Part C: (Base Order Options for supply of further Trains and Equipment) of schedule 10 (Milestones and Security);

"Foreign Exchange Adjusted WLO Additional Trains Option Price" means the WLO Additional Trains Option Price as adjusted for the relevant Whole Line Option in

accordance with the relevant formula set out in paragraphs 1.1, 2.1, 3.1 and 4.1 of Appendix 4 to schedule 25 (Whole Line Options) as applicable.

"Foreseeable Changes in Law" means any Change in Law which was reasonably foreseeable by a prudent manufacturer of rolling stock as at the date of this Agreement with such a degree of certainty and detail as to be reasonable for such manufacturer to have reflected the effects of such Change in Law in the supply of the Trains and Equipment;

"FRACAS" means the fault recording analysis and corrective action system set out in schedule 17 (Design Management);

"FSA IPR" has the meaning given to such term in clause 29.3;

"FSA Purchased Items" has the meaning given to such term in the FSA;

"Free Issue Materials" means those materials (but not including the Pre-Specified Free Issue Materials) provided by the Purchaser to the Manufacturer at no cost to the Manufacturer for inclusion in the Trains on the basis set out in clause 23.3;

"Further Equipment" has the meaning given to such term in clause 15.24(a);

"General Change in Law" means a Change in Law which is not a Discriminatory Change in Law;

"GoA" has the meaning given to such term in Section 24 of the Train Technical Specification;

"Good Industry Practice" means the exercise by the Manufacturer of that degree of skill, care, diligence, prudence, foresight and practice which would ordinarily be expected of a skilled and experienced contractor engaged in the relevant discipline;

"Graffiti" means painted, written, sprayed, etched or scratched graffiti and/or stickers;

"Greater London Authority" or **"GLA"** means the Greater London Authority, a body corporate established by section 1 of the Greater London Authority Act 1999 and its successors;

"Group" means, in relation to any company (which for the purposes of this Agreement shall include TfL), that company and any group undertaking of that company from time to time and all of them and each of them as the context admits; for which purposes group undertaking has the meaning given to such term by section 1161 of the Companies Act 2006;

"Guarantee" means the guarantee provided or to be provided by the Guarantor in favour of the Purchaser in the form set out in schedule 22 (Form of Parent Company Guarantee);

"Guarantee Event" means:

- (a) the Guarantee ceases to be in full force and effect; or
- (b) the Guarantor's obligations under the Guarantee are or become wholly or partly invalid or unenforceable;

"Guarantor" means Siemens Aktiengesellschaft a company incorporated under the laws of Germany whose registered office is at Wittelsbacherplatz 2, 80333 Munich, Germany and which is registered under company number HRB 6684 or any other entity acceptable to the Purchaser (in its absolute discretion);

"Hazard Log" has the meaning given to such term in paragraph 15.1 of schedule 17 (Design Management);

"HMRI" means Her Majesty's Railway Inspectorate and any successor body;

"Holding Company" has the meaning given to such term in section 1159 of the Companies Act 2006, save that for the purposes of determining whether one entity is a Holding Company of another, any transfer of shares by way of security or to a nominee of the transferor shall be disregarded;

"Holdpoint Date" means the Key Programme Date for Approval of the Train/ PDP Interface Control Document in relation to the Train-borne RCS S&TC and RCS OCS (Milestone 3) in relation to the Base Order set out in Part A: of schedule 3 (Project Programme);

"HSE" means the Health and Safety Executive;

"HSWA" means the Health and Safety at Work Act 1974;

"Hybrid Cooling Development Project" means the Purchaser's project to develop a viable Hybrid Cooling System for the DTUP;

"Hybrid Cooling System" means a saloon cooling system, incorporating energy storage and reducing the heat emitted from the Trains in a Fleet into the tunnels and **"Hybrid Cooling"** shall be construed accordingly;

"Hybrid Cooling Unit" means a unit for use in the Hybrid Cooling System;

"Immediately Effective Clauses" means clauses 1 (Definitions and Interpretation), 2 (Commencement and Conditions Precedent), 3 (Representations and Warranties), 29 (Intellectual Property Rights), 30 (Manufacturer Default); 31 (Purchaser Default); 32 (Force Majeure), 33 (Force Majeure Termination/Declaration of Ineffectiveness), 34 (Prohibited Act and Safety Breach Termination), 35 (Consequences of Termination), 36 (Voluntary Termination or Suspension by the Purchaser); 37 (Indemnities and Limitations on Liability), 38 (Confidentiality), 39 (Freedom of Information), 40 (Dispute Resolution), 42 (Safety, Quality and Environmental Plan) to 62 (Governing Law and Jurisdiction) and schedule 24 (Foreign Exchange);

"Indemnified Parties" means:

(a) the Purchaser; and

(b) the Owner,

and, in each case, all or any of their respective Affiliates, employees, servants, agents, directors, officers, contractors and subcontractors and **"Indemnified Party"** shall mean either of them, as appropriate;

"Indemnifying Party" means a Party that has agreed under the terms of this Agreement to indemnify another person on the basis set out in this Agreement;

"Independent Auditor" has the meaning given to such term in paragraph 6.5 of schedule 20 (Termination Payments);

"Indexation Base Month" means April 2015;

"Indexed" means indexed in accordance with clause 1.2(q);

"Indirect Losses" means loss of profits, loss of use, loss of production, loss of business, loss of business opportunity, consequential loss and for indirect loss of any nature;

"Ineffective" and **"Ineffectiveness"** have the meanings given to such terms in the Utilities Contracts Regulations and shall be construed accordingly;

"Infrastructure Manager" means the person taking on the role of infrastructure manager in respect of Railway Infrastructure under the ROGS;

"Infringement" shall have the meaning given to such term in clause 29.9;

"Initial APB Bond Amount" shall have the meaning given to such term in paragraph 1.1 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);

"Initial Change Appraisal" means any written report delivered by the Manufacturer in accordance with paragraph 2.1 of Part B: (Purchaser Changes) of schedule 12 (Change Procedure);

"Initial Claim Appraisal" means any written report delivered by the Manufacturer in accordance with paragraph 1.1 of Part D: (Compensation Changes) of schedule 12 (Change Procedure);

"Insolvency Event" in relation to any person means any of the following:

- (a) such person stopping or suspending or threatening to stop or suspend payment of all or a material part of its debts, or becoming unable to pay its debts, or being deemed unable to pay its debts under section 123(1) or (2) of the Insolvency Act 1986;
- (b) any step being taken by any person with a view to the winding up of such person or any person presenting a winding-up petition in respect of such person which is not dismissed within 7 days;
- (c) any step being taken to enforce security over or a distress execution or other similar process being levied or served out against the whole or a substantial part of the assets or undertaking of such person;
- (d) a receiver, administrative receiver, administrator, compulsory manager or other similar officer being appointed in respect of such person;
- (e) such person ceasing or threatening to cease to carry on all or a material part of its business, except for the purpose of and followed by a reconstruction, amalgamation, reorganisation, merger or consolidation on terms approved by the Purchaser (in its absolute discretion) before that step is taken;
- (f) the making by such person of a general assignment or an arrangement or composition with or for the benefit of creditors; or
- (g) any event occurring which, under the laws of any relevant jurisdiction other than England and Wales, has an analogous or equivalent effect to any of the events listed above;

"Insolvent" means:

- (a) in the case of a company that it has suffered, or is the subject of, an Insolvency Event that is current and/or has not been dismissed or fully remedied; or
- (b) in the case of an individual that:

- (i) he has had a bankruptcy order or an interim order made against him and such order has not been discharged;
 - (ii) he has entered into a composition with his creditors or a scheme of arrangement of his affairs; or
 - (iii) there is current an appointment of an interim receiver in respect of his property; or
- (c) in either case that circumstances exist or proceedings have been instituted (and not dismissed) or events have occurred or are occurring outside the jurisdiction of the courts of England which have an analogous effect to any referred to in paragraphs (a) and (b) above;

"Integration Testing" has the meaning given to such term in paragraph 7.1 of schedule 7 (Testing and Inspection);

"Intellectual Property Rights" or **"IPR"** means all rights in or in relation to any and all patents, utility models, trade and service marks, rights in designs, get-up, trade, business or domain names, copyrights, topography rights (whether registered or not and any applications to register or rights to apply for registration of any of the foregoing), rights in inventions, know-how, trade secrets and other confidential information, rights in databases and all other intellectual property rights of a similar or corresponding character which may now or in the future subsist in any part of the world;

"Interface" means any physical, functional or contractual boundary, either:

- (a) internal to the DTUP; or
- (b) between PDPs and other projects, programmes, systems or third parties that affect any aspects of the Works or the DTUP,

and shall imply an impact by one (or more) of the parties or systems involved on one (or more) of the others;

"Interface Control Document" or **"ICD"** has the meaning given to such term in paragraph 2.2(i)(i) of schedule 26 (Systems Integration);

"Interface Manager" has the meaning given to such term in paragraph 2.1(c) of schedule 26 (Systems Integration);

"Interface Register" means the preliminary interface register prepared, managed and updated by the Purchaser listing the Interfaces identified;

"Interim Milestone Payments" has the meaning given to such term in clause 2.7(a);

"Interior Features" means those elements of the visible interior design of the Trains (including the overall internal layout, seating positions, cab layout, fittings, "look and feel", colours, materials and branding) that are original and distinctive (meaning not commonplace in the relevant design field);

"International Standards" means those standards produced by the International Standards Organisation of 1, ch. de la Voie-Creuse, CP56, CH-1211 Geneva 20, Switzerland or the International Electrotechnical Commission of 3 Rue de Varembe, PO Box 131, CH1211, Geneva 20, Switzerland;

"Item Code" has the meaning given to such term in Part D: (Bill of Materials) of schedule 8 (Spares and Special Tools);

"Irrecoverable VAT" has the meaning given to it in clause 28.6;

"Joint Development" means a project or development relating to the DTUP and the performance of (i) the Manufacturer's obligations under this Agreement; and/or (ii) the Service Provider's obligations under the FSA, which:

- (a) is jointly undertaken by the Parties;
- (b) is agreed in writing by both Parties in advance of its commencement to be a joint development;
- (c) involves contributions from both Parties throughout the development, including the provision of staff from each Party to work directly on the development; and
- (d) requires sign off from both Parties before the development is complete;

"Key Posts" means those key roles within the Manufacturer organisation listed in Appendix 1 (Key Posts) to schedule 5 (Contract Management) to be undertaken only by other persons where approved by the Purchaser in advance in accordance with paragraph 3 of schedule 5 (Contract Management);

"Key Programme Dates" means the agreed programme of key dates and milestones relating to the Manufacturer's obligations under this Agreement set out in Part A: of schedule 3 (Project Programme);

"Key Subcontract" means a Subcontract for the supply of a Subsystem listed in Part A: of schedule 11 (Subcontracts);

"Key Subcontractor" means each counterparty to a Key Subcontract (other than the Manufacturer);

"Law" means any Legislation or common law of the United Kingdom, any exercise of the Royal Prerogative, and any enforceable community right within the meaning of section 2 of the European Communities Act 1972 in each case enforceable in the United Kingdom or any other principles of law or equity established by the Courts;

"LD Notice" has the meaning given to such term in clause 16.6;

"Lead PDP" has the meaning given to such term in paragraph 2.2(a) of schedule 26 (Systems Integration);

"Legislation" means any Act of Parliament or subordinate legislation within the meaning of section 21(1) of the Interpretation Act 1978, any exercise of the Royal Prerogative, and any enforceable community right within the meaning of section 2 of the European Communities Act 1972 in each case enforceable in the United Kingdom (and including any modification, amendment or re-enactment of such Legislation from time to time and any instruments, orders or regulations made pursuant thereto);

"LFEPA" means the London Fire and Emergency Planning Authority and any successor body;

"Line Replaceable Unit" or "LRU" means the line replaceable units defined in Section 21.5 of the Train Technical Specification;

"Listed Person" has the meaning given to such term in clause 46.1(b);

"Losses" means any claims, proceedings, losses, liabilities, suits, judgements, costs, expenses, Taxes, penalties or fines whether arising under statute, contract or at common law;

"LU Corporate Risk Model" means the LUQRA model which assesses the risk from major hazards with the potential to cause fatality to customers and other members of the public;

"LUL Database" means a database containing, as a minimum, the following information relating to the Trains and Equipment provided or to be provided by the Manufacturer in accordance with clause 15 (Acceptance of Trains and Equipment):

- (a) each Train's car numbers; and
- (b) the maintenance and modification status of all Trains, Equipment, systems, Subsystems, Major Components and Parts, with the Manufacturer's part numbers, to the extent that these are identified by the Manufacturer's part number;

"LUL Network" means the stations and depots (wherever situated) (including the Designated Depots), assets, systems, track, and other buildings, facilities and equipment which are used from time to time in the maintenance and provision of the underground service, including the Bakerloo Line north of Queen's Park, known as "London Underground";

"LUL Network Testing" means testing of the Trains on the LUL Network more specifically set out in paragraph 10 of Part A (Testing and Inspection Requirements): of schedule 7 (Testing and Inspection);

"LUL Operating Conditions" means an aspect of, or factor relating to, the operational environment of the LUL Network and/or the Purchaser's business and operations, of which the Manufacturer is or becomes aware (or should have been aware as a prudent manufacturer and maintainer of rolling stock), including those relating to:

- (a) the interfaces set out in Section 2 of the Train Technical Specification;
- (b) the Interfaces set out in schedule 26 (Systems Integration);
- (c) the usage, operation and maintenance practices applied to the Trains by the Purchaser in accordance with the Manuals and the Train Maintenance Regime; and
- (d) any other aspect of the operational environment of which the Purchaser has made the Manufacturer aware either in the Train Technical Specification or otherwise,

which will, or is reasonably likely to, have an adverse impact on the performance, use, maintenance or design-life of a Train, item of Equipment or Major Component;

"LUL Standards" means:

- (a) technical standards with which railway assets, or equipment used on or as part of railway assets, must conform; and
- (b) operating procedures with which the operators of railway assets must comply,

in each case as issued and maintained by the Purchaser;

"LUL Train Services" means the services (including all passenger services and diversionary routes) to be operated on the LUL Network by the Purchaser as set out in the LUL Working Timetable from time to time;

"LUL Working Timetable" means the working timetable issued and updated by LUL from time to time specifying the times of all the movements on the LUL Network;

"LUQRA" has the meaning given to such term in paragraph 13.5(d) of schedule 17 (Design Management);

"Maintainability Demonstration Testing" means the tests carried out in accordance with paragraph 5 of Part A: of schedule 7 (Testing and Inspection);

"Maintenance Cost" has the meaning given to such term in clause 15.15(c);

"Maintenance Spares" means the Base Order Maintenance Spares, the Bakerloo Line Maintenance Spares, the Central Line Maintenance Spares, and/or the Waterloo & City Line Maintenance Spares, as the case may be;

"Major Component" means each of the items set out in column 1 of the table set out in clause 20.2;

"Mandatory Modification" means a Modification required by Applicable Laws and Standards;

"Manuals" means the documents set out in paragraphs 1 to 17 of schedule 28 (Technical Information) which fully describe how the Trains and Equipment function and how they should be operated, serviced, maintained, repaired and overhauled (including in the case of the Saloon Mock-up and the Train Driving Simulators, any relocation instructions and installation instructions) provided or to be provided by the Manufacturer pursuant to clause 6.5 and, in relation to each Whole Line Option, shall include any supplement specific to that Whole Line Option pursuant to the exercise of the relevant Whole Line Option;

"Manufacturer Change" has the meaning given to such term in paragraph 1.1 of Part C: (Manufacturer Changes) of schedule 12 (Change Procedure);

"Manufacturer Change Notice" has the meaning given to such term in paragraph 1.1 of Part C: (Manufacturer Changes) of schedule 12 (Change Procedure);

"Manufacturer Compensation Proposal" has the meaning given to such term in paragraph 5.1(a) of Part D: (Compensation Changes) of schedule 12 (Change Procedure);

"Manufacturer Confidential Information" means the Confidential Information listed in schedule 18 (Manufacturer Confidential Information);

"Manufacturer Contract Manager" has the meaning given to such term in paragraph 1.3 of schedule 5 (Contract Management);

"Manufacturer Cost Proposal" has the meaning given to such term in paragraph 6.1(a) of Part B: (Purchaser Changes) of schedule 12 (Change Procedure);

"Manufacturer Depot Warranty Works" has the meaning given to such term in clause 7.11(c);

"Manufacturer Event of Default" means any of the events or circumstances listed in clause 30.1;

"Manufacturer Fault" means a Fault which is not a Purchaser Fault;

"Manufacturer Group" means the Manufacturer, the Service Provider, the Guarantor and any member of their/its Group from time to time;

"Manufacturer IPR" means the IPR, whether existing at the date of this Agreement or arising hereafter, that is owned by the Manufacturer or any of its Affiliates;

"Manufacturer Termination Notice" has the meaning given to such term in clause 31.3;

"Manufacturer Train Proposal" means the Manufacturer's proposal in schedule 2 (Manufacturer Train Proposal), setting out how the Manufacturer proposes to achieve the requirements of the Train Technical Specification;

"Manufacturer's Premises" means the Manufacturer's premises at Siemens Mobility GmbH, Leberstrasse 34, 1110 Vienna, Austria and Siemens Mobility GmbH, Test and Validation Center, Friedrich-List-Allee 1, 41844 Wegberg-Wildenrath, Germany;

"Manufacturer's Records" has the meaning given to such term in clause 9.3(a)(i);

"Manufacturer Serious Infringement" has the meaning given to such term in clause 33.4(b)(i);

"Manufacturing Tooling" means:

- (a) jigs, fixtures and patterns required for forming and/or moulding parts or laminating elements, dies for hot and/or cold treated shape sections and tooling for pressed parts; and
- (b) all other tools and/or equipment used in the production and testing of the Trains and Equipment, including all related software, manuals and other related documentation;

"Maximum Liability" has the meaning given to such term in clause 37.5;

"Mayor" means the Mayor of London from time to time;

"MDBSAF" means the mean distance between Service Affecting Failures, excluding any Service Affecting Failures directly caused by a Purchaser Fault;

"MDBTSAF" means the mean distance between Test Service Affecting Failures;

"Migration State" means each settled configuration of railway assets, personnel and operating rules which can endure for a period of time while preparations are made to move to the next migration state/settled configuration;

"Milestone" means the completion of a specified activity or collection of activities or the occurrence of an event defined or identified as such in the relevant Schedule of Milestones;

"Milestone Payment" means the sum payable to the Manufacturer in respect of each Milestone in accordance with schedule 10 (Milestones and Security);

"Milestone Payment Invoice" has the meaning given to such term in paragraph 5.1 of Part B: (Milestones) of schedule 10 (Milestones and Security);

"Modification" means any change, modification or addition to any Train or item of Equipment;

"MSA Spares" means the Base Order Spares, the Base Order Option Spares, the WLO Spares and the WLO Additional Spares;

"Network Rail" or **"NR"** means Network Rail Infrastructure Limited a company incorporated under the laws of England and Wales (registered number 2904587), whose registered office is at 1 Eversholt Street, London, NW1 2DN and any successors to its functions or any relevant part thereof;

"Non-Standard Tools" means the:

- (a) Base Order Non-Standard Tools; and
- (b) WLO Non-Standard Tools,

as the case may be;

"Notice of Milestone Achievement" has the meaning given to such term in paragraph 3.1 of Part B: (Milestones) of schedule 10 (Milestones and Security);

"Obsolescence" means the obsolescence of any Part, Spare, Consumable or Special Tool or item of Equipment whether this is due to technical, economic, availability, statutory or any other relevant matters;

"OEM" means the original equipment manufacturer;

"Office of Rail and Road" or "ORR" means the Office of Rail and Road from time to time established under the Railways and Transport Safety Act 2003 and includes any successor to all or any of its functions;

"OPO CCTV" means One Person Operation Platform to Train CCTV as described in Section 2.12 of the Train Technical Specification;

"Option Train Driving Simulator" means any supplementary Train Driving Simulator supplied or to be supplied pursuant to the exercise of a Base Order Option by the Purchaser under clause 6.6(a);

"OTC Data Tool" means the data tool described in Section 15.10.5 of the Train Technical Specification;

"OTC – Infrastructure-Borne Equipment" means the equipment which is installed, or is to be installed, by or on behalf of the Purchaser on platforms at stations on the LUL Network, at the relevant Designated Depots and at other relevant locations on the LUL Network as part of the Off-Train Communications described in Section 15.10 of the Train Technical Specification;

"Other Pre-PAC Trains" means all Trains in the relevant Fleet excluding the First and Second Pre-PAC Trains and the Third to Fifth Pre-PAC Trains;

"Overhaul Interval" means, in respect of any ACS/Overhaul Component, each interval between planned overhauls as set out in the Train Maintenance Regime (including the Train Maintenance Plan), the first of which ends on the date which is the day before the day on which the first planned overhaul is due to be carried out in respect of an ACS/Overhaul Component as set out in the Train Maintenance Regime (including the Train Maintenance Plan);

"Owner" means the Purchaser or such other person nominated by the Purchaser in accordance with clauses 18.1 and 18.3 to take title to, have supplied to it, and own, any Purchased Items;

"Part" means any component (including Major Components), furnishing or equipment forming part of a Train or item of Equipment from time to time;

"Partially Terminate" means the termination of such elements of the Works as the Purchaser decides, provided that the Purchaser shall only be entitled to terminate the whole (and not part) of the Base Order and the whole (and not part) of any Whole Line Option but may terminate any one or more of each such order without terminating all of

them and **"Partially Terminated"** and **"Partial Termination"** shall be construed accordingly;

"Participating PDP" means, in relation to a specific Interface, a PDP that is not the Lead PDP;

"Party" means each of:

- (a) the Purchaser; and
- (b) the Manufacturer,

and **"Parties"** shall be construed accordingly;

"PDP Representatives" has the meaning given to such term in clause 9.5(a);

"PEDs" means platform edge doors;

"Permitted Party" has the meaning given to such term in clause 44.3(a);

"Permitted Use" means the operation of the Trains on any part of the LUL Network, and the operation of the Train Driving Simulators, in each case in accordance with all Applicable Laws and Standards, Relevant Approvals and the Manuals, subject to any derogations granted by the Purchaser, acting as Infrastructure Manager, or Network Rail;

"Persistent Breach" has the meaning given to such term in clause 30.3;

"Personal Data" means personal data as defined in the DP Legislation which is supplied to the Manufacturer by the Purchaser or obtained by the Manufacturer in the course of performing its obligations under this Agreement;

"Plan" means any of the plans described as such in this Agreement that are required to be produced by the Manufacturer in accordance with this Agreement;

"Planned FSA Services Commencement Date" means, in respect of each Fleet, the date which is two (2) years following the date of Provisional Acceptance or Qualified Provisional Acceptance (whichever occurs first) of the last Train in that Fleet (excluding any Base Order Option Trains or WLO Additional Trains) and on which it is planned that Services commence under the FSA in respect of that Fleet (as set out in clause 2 of the FSA);

"PPI" means the "MB56" figure published on a monthly basis by the Office of National Statistics;

"Preconditions" has the meaning given to such term in clause 15.10;

"Preconditions Retention" has the meaning given to such term in clause 15.11(a);

"Preconditions Timetable" has the meaning given to such term in clause 15.10;

"Pre-exercise Consultation Date" means for each Whole Line Option the date by which the Purchaser and the Manufacturer shall consult in relation to whether the Purchaser intends to exercise the relevant Whole Line Option, as set out in Column (2) of the table in clause 6.8;

"Preliminary Design" means the preliminary design of the Trains and Equipment for the Base Order and the production of each of the items described in paragraph 7 of schedule 17 (Design Management);

"Preliminary Design Phase" means the period commencing on the expiry of the Concept Design Phase for the Base Order and ending on the date of Approval of the Preliminary Design Submission for the Base Order pursuant to schedule 17 (Design Management);

"Preliminary Design Submission" means the submission of Train and Equipment Design information for the Base Order in accordance with paragraph 7 of schedule 17 (Design Management);

"Pre-Provisional Acceptance" means, in relation to any Train, that the Train complies fully with the Pre-Provisional Acceptance Criteria as evidenced by and occurring upon the issue of a Pre-Provisional Acceptance Certificate for that Train, and **"Pre-Provisionally Accept"** and **"Pre-Provisionally Accepted"** shall be construed accordingly in each case;

"Pre-Provisional Acceptance Certificate" means a certificate in the form set out in Part A: of schedule 21 (Pro Forma Certificates), issued by the Purchaser in respect of a Train, as to compliance by such Train with the Pre-Provisional Acceptance Criteria;

"Pre-Provisional Acceptance Criteria" means, in respect of any Train, the criteria for issue of a Pre-Provisional Acceptance Certificate as set out in clause 15.2;

"Pre-Provisional Preconditions" has the meaning given to such term in clause 15.3A;

"Pre-Provisional Preconditions Timetable" has the meaning given to such term in clause 15.3A;

"Pre-Specified Free Issue Materials" means the following equipment as further described in the Train Technical Specification:

- (a) Train-borne RCS S&TC;
- (b) Train-borne RCS OCS;
- (c) OPO CCTV;
- (d) Train Radio;
- (e) electromagnetic short circuiting device;
- (f) shoe paddles;
- (g) detonators;
- (h) red flag and stick;
- (i) carry sheet;
- (j) ice scraper; and
- (k) Network Rail track circuit clips;

"Primary Assembly and Manufacture" means the assembly of each modular body shell, the installation of all Subsystems within each body shell, and the routine testing of all final assembled vehicles;

"Primavera" means Oracle Primavera version 6.2 or above;

"Processing" has the meaning given in the DP Legislation; **"Process"**, **"Processed"** and **"Sub-Process"** shall be construed accordingly;

"Progressive Assurance" means the process by which the Manufacturer provides evidence on a progressive basis to the Purchaser throughout the Assurance Period to demonstrate to the Purchaser that the Manufacturer has understood the Train Technical Requirements and it is carrying out its obligations and delivering each Purchased Item in accordance with the Train Technical Specification, all Applicable Laws and Standards, Relevant Approvals, Good Industry Practice, safety and quality requirements and all other requirements of this Agreement;

"Prohibited Act" means:

- (a) offering, giving or agreeing to give any servant, agent, contractor or representative of a Public Sector Body any gift or consideration of any kind as an inducement or reward:
 - (i) for doing or not doing (or having done or not having done) any act in relation to the obtaining or performance of this Agreement or any other contract with a Public Sector Body; or
 - (ii) for showing or not showing favour or disfavour to any person in relation to this Agreement or any other contract with a Public Sector Body;
- (b) entering into this Agreement or any of the Project Documents or any contract with a Public Sector Body in connection with which commission has been paid or has been agreed to be paid by the Manufacturer or on its behalf, or to its knowledge, unless the terms and conditions of any such contract for the payment thereof have been disclosed in writing to the Purchaser;
- (c) committing any offence:
 - (i) under the Bribery Act 2010;
 - (ii) under law created in respect of fraudulent acts; or
 - (iii) at common law in respect of fraudulent acts in relation to this Agreement or any other contract with a Public Sector Body;
- (d) defrauding or attempting to defraud or conspiring to defraud a Public Sector Body; or
- (e) without prejudice to limbs (a) to (d) above, committing any of the offences set out in regulation 57(1) of the Public Contracts Regulations 2015;

"Prohibited Act Notice" has the meaning given to such term in clause 34.2;

"Project" means the Works provided or to be provided under this Agreement and the provision of the Services by the Service Provider in accordance with the FSA;

"Project Delivery Partner" or **"PDP"** means an organisation (whether external to or internal within the Purchaser's organisation or any Purchaser Affiliate) who is contracted to deliver any or all projects associated with the DTUP, including the Manufacturer;

"Project Documents" means:

- (a) this Agreement;
- (b) the FSA;
- (c) each of the Direct Agreements;

- (d) the Escrow Agreement; and
- (e) the Guarantee;

"Project Execution Plan" has the meaning given to such term in paragraph 9.1 of schedule 5 (Contract Management);

"Project Office" has the meaning given to such term in clause 7.8(b);

"Project Programme" means, for the Base Order, the programme set out in Part B: of schedule 3 (Project Programme) and in relation to each Whole Line Option shall be such Project Programme as supplemented by the relevant WLO Project Programme in each case as may be amended from time to time in accordance with this Agreement;

"Project Progress Report" has the meaning given to such term in paragraph 7.1 of schedule 5 (Contract Management);

"Project Review Meeting" has the meaning given to such term in paragraph 8.1 of schedule 5 (Contract Management);

"Provisional Acceptance" means, in relation to any Train, that the Train complies fully with the Provisional Acceptance Criteria as evidenced by and occurring upon the issue of a Provisional Acceptance Certificate for that Train, and Provisionally Accept and Provisionally Accepted shall be construed accordingly in each case;

"Provisional Acceptance Certificate" or **"PAC"** means a certificate in the form set out in Part A: of schedule 21 (Pro Forma Certificates), issued by the Purchaser in respect of a Train, certifying that such Train complies with the Provisional Acceptance Criteria;

"Provisional Acceptance Criteria" means, in respect of any Train, each of the criteria for issue of a Provisional Acceptance Certificate set out in clause 15.4;

"PSFIM Supplier" has the meaning given to such term in clause 23.2(a)(i);

"Public Sector Body" means all Ministers of the Crown, government departments, Crown agencies and authorities, local authorities or similar public sector bodies and any body corporate owned or controlled by any of them (including for the avoidance of doubt the Purchaser, TfL and the SoS);

"Purchased Item" means each Train and item of Equipment ordered from the Manufacturer in accordance with this Agreement;

"Purchaser Change" has the meaning given to such term in paragraph 1.1 of Part B: (Purchaser Changes) of schedule 12 (Change Procedure);

"Purchaser Change Notice" has the meaning given to such term in paragraph 1.2 of Part B: (Purchaser Changes) of schedule 12 (Change Procedure);

"Purchaser Contract Manager" has the meaning given to such term in paragraph 1.1 of schedule 5 (Contract Management);

"Purchaser Depot Works" means the works to be carried out by or on behalf of the Purchaser as set out in schedule 9 (Purchaser Depot Works);

"Purchaser Event of Default" means any of the events or circumstances listed in clause 31.1;

"Purchaser Fault" means a Fault which results from:

- (a) the Purchaser:
 - (i) operating the relevant Train or item of Equipment materially other than in accordance with the Permitted Use; or
 - (ii) maintaining the relevant Train or item of Equipment materially other than in accordance with the Manuals; or
- (b) damage to a Train whilst that Train is in the Purchaser's (or any subcontractors of the Purchaser other than the Manufacturer or Service Provider) care, custody or control; or
- (c) damage caused to a Train (as proved by the Manufacturer and demonstrated in written evidence from a reputable and independent third party with relevant experience) as a direct result of any Railway Infrastructure being in a condition which is worse than that to be expected of such Railway Infrastructure which is being maintained by a competent maintenance contractor having regard to:
 - (i) the standards applicable to such Railway Infrastructure (being LUL Standards in the case of Railway Infrastructure controlled by the Purchaser and Railway Group Standards in the case of Railway Infrastructure controlled by Network Rail); and
 - (ii) the condition of such Railway Infrastructure (to the extent that such Railway Infrastructure exists) at the date of this Agreement taking into account that the condition of certain parts of such Railway Infrastructure may not be compliant with LUL Standards or Railway Group Standards as the case may be,

in each case, where such Fault is not caused by: (A) an act, omission, neglect or default of the Manufacturer, any other member of the Manufacturer's Group, any Subcontractor or the employees or suppliers of any of them; or (B) the Manufacturer's or Service Provider's performance, non-performance or purported performance of its obligations under this Agreement or the FSA;

"Purchaser Fault Spares" means the Base Order Purchaser Fault Spares, the Bakerloo Line Purchaser Fault Spares, the Central Line Purchaser Fault Spares, and/or the Waterloo & City Line Purchaser Fault Spares, as the case may be;

"Purchaser Milestone Payment Certificate" has the meaning given to such term in paragraph 4.1(a) of Part B: (Milestones) of schedule 10 (Milestones and Security);

"Purchaser Serious Infringement" has the meaning given to such term in clause 33.4(b)(ii);

"Purchaser Statement" means a statement issued by the Purchaser to the Manufacturer in relation to the tender for Acceptance of a Train, Train Driving Simulator or an item of First-in-Class Equipment, setting out which of the relevant conditions and/or Acceptance Criteria (as applicable) have not been satisfied;

"Purchaser Termination Notice" has the meaning given to such term in clause 30.6;

"Qualified Provisional Acceptance" means the qualified provisional acceptance by the Purchaser of a Train which does not comply fully with the Provisional Acceptance Criteria, in accordance with clause 15.10, as evidenced by and occurring upon the issue of a Qualified Provisional Acceptance Certificate for that Train;

"Qualified Pre-Provisional Acceptance Certificate" or "QPPAC" means a certificate in the form set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser in respect of a Train in accordance with clause 15.3A;

"Qualified Provisional Acceptance Certificate" or "QPAC" means a certificate in the form set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser in respect of a Train in accordance with clause 15.10;

"Qualifying Change in Law" means:

- (a) a Discriminatory Change in Law; and/or
- (b) a General Change in Law which requires the Manufacturer to make any Capital Expenditure which is incurred in relation to the Trains and Equipment, on or after the date which is four (4) years after the Commencement Date in relation to the Base Order,

except, in each case, excluding any Foreseeable Changes in Law that comes into force substantially in the form envisaged as at the Commencement Date for the Base Order;

"Quality Management Plan" has the meaning given to such term in paragraph 10.1 of schedule 5 (Contract Management);

"Quality Standards" means those standards set out in clause 42.3(b)(i);

"RAIB" means the Railway Accident Investigation Branch;

"Rail and Underground Health, Safety and Environment Policy" means the Purchaser's Rail and Underground Health, Safety and Environment Policy (May 2015) set out in Appendix 3 to schedule 16 (Health, Safety and Environment) as updated from time to time;

"Railway Group Standards" means:

- (a) technical standards with which railway assets, or equipment used on or as part of railway assets, must conform; and
- (b) operating procedures with which the operators of railway assets must comply,

in each case as issued and maintained by the Rail Safety and Standards Board and authorised pursuant to the document known as the Railway Group Standards Code;

"Railway Infrastructure" means the fixed assets used for the operation of a railway including its permanent way and plant used for signalling or exclusively for supplying electricity for operational purposes to the railway;

"RCS S&TC " means the Railway Control System Signalling and Train Control procured or to be procured by the Purchaser, as more fully described in the Train Technical Specification;

"RCS OCS" means the RCS Operational Control System, procured or to be procured by the Purchaser, as more fully described in the Train Technical Specification;

"Recipient" has the meaning given to such term in clause 37.4;

"Recognised Investment Exchange" has the meaning given to such term in section 285 of the Financial Services and Markets Act 2000;

"Recondition" means to carry out works to and/or repair a Spare or Part that is capable of being repaired so that, following such works and/or repair:

- (a) in the case of a planned overhaul of a Spare or Part in accordance with the Train Maintenance Regime, the condition of the reconditioned Spare or Part is no worse than the condition it was in when such Spare or Part was originally supplied by the Manufacturer; and
- (b) in any case that does not fall within paragraph (a) above, the level of wear and tear and functionality of the reconditioned Spare or Part is no worse than the level of wear and tear and functionality before the need for such reconditioning arose,

and **"Reconditioned"** and **"Reconditioning"** shall be construed accordingly;

"Rectification Plan" has the meaning given to such term in clause 30.6(b)(i);

"Recurrent Defect" means a Manufacturer Fault (in each case arising from the same root cause) in any one or more of a Part or Component of a Train, Spare, Consumable, Special Tool, Train Driving Simulator, Part or item of Equipment and which in any consecutive 12-month period occurs or the Purchaser reasonably believes will occur, (in each case, in the same or across more than one Fleet) in respect of:

- (a) the structural integrity of any Major Component (other than the Excluded Major Components), five (5) or more times;
- (b) visual electronic information displays, so as to affect nine point six (9.6) per cent or more of the visual electronic information displays;
- (c) door control units, so as to affect six point three (6.3) per cent or more of the door control units;
- (d) any of the Excluded Major Components and other Train, Spare, Consumable, Special Tool, Train Driving Simulator, Part or item of Equipment (together **"Affected Parts"**), so as to affect three (3) per cent or more Affected Parts of the same kind;

"Recurrent Defect Period" means the period commencing on the date of Provisional Acceptance or Qualified Provisional Acceptance (whichever occurs first) of the first Train to be Accepted and expiring on the date which is ten (10) years after Provisional Acceptance or Qualified Provisional Acceptance (whichever occurs first) of the last Train to be Provisionally Accepted in the last Fleet ordered by the Purchaser under this Agreement;

"Relevant Approvals" means all applicable consents, approvals, permissions, authorisations, acceptances, certifications, licences, exemptions, filings, permits, registrations, notarisations, declarations, letters of no objection and other matters required in each case from any Competent Authority, pursuant to any Applicable Laws and Standards in relation to any of the Manufacturer's obligations under this Agreement including (without limitation) under the Act and the ROGS;

"Relevant Date" has the meaning given to such term in clause 45.1(d);

"Relevant Event" means:

- (a) a Purchaser Change;
- (b) a Qualifying Change in Law;
- (c) a Compensation Event; or

- (d) any other matter as a result of which there may be adjustments to the Milestone Payments in accordance with this Agreement;

"Relevant Property" means the LUL Network and any other property belonging to or occupied by any of the Indemnified Parties;

"Reliability Case" has the meaning given to such term in paragraph 12.1 of schedule 17 (Design Management);

"Relief Event" means:

- (a) fire, explosion, lightning, storm, tempest, flood, bursting or overflowing of water tanks, apparatus or pipes, ionising radiation (to the extent it does not constitute a Force Majeure Event), earthquakes, riot and civil commotion;
- (b) failure by any statutory undertaker, utility company, local authority or other like body to carry out works or provide services;
- (c) any blockade or embargo which does not constitute a Force Majeure Event; and
- (d) any:
 - (i) official or unofficial strike;
 - (ii) lockout;
 - (iii) go-slow; or
 - (iv) other dispute,

generally affecting the train manufacturing industry or a significant sector of it,

unless any of the events listed in limbs (a) to (d) arises (directly or indirectly) as a result of any act, omission, breach, wilful default or wilful act of the Manufacturer, the Service Provider or any of its Subcontractors of any tier;

"Remedial Plan" has the meaning given to such term in clause 30.2(a)(iii);

"Remobilisation Payment" means the relevant amount to be paid by the Purchaser to the Manufacturer in relation to a Whole Line Option as set out in the relevant table in Appendix 3 to schedule 25 (Whole Line Options) in accordance with clause 6.17 and schedule 25;

"Request for Information" or "RFI" has the meaning given to such term in clause 7.6(b);

"Required APB Bond Amount" means the amount for which the Manufacturer is required to provide one or more Advance Payment Bonds from time to time in accordance with Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security), being the Initial APB Bond Amount at the Commencement Date, as increased and/or decreased thereafter in accordance with paragraphs 1.7 to 1.9 of Part A: of schedule 10;

"Required Insurances" has the meaning given to such term in paragraph 1.1 of Part A: of schedule 13 (Insurance);

"Responsible Procurement" has the meaning given to such term in paragraph 1.2 of schedule 14 (Responsible Procurement);

"Retail Price Index" or "RPI" means the "all items" RPI figure including mortgage interest payments (RPI All items) published on a monthly basis by the Office for National Statistics;

"Retention Period" has the meaning given to such term in clause 9.3(a)(ii);

"Revocation" has the meaning given to such term in paragraph 2.1 of schedule 5 (Contract Management) and **"Revoked"** shall be construed accordingly;

"RIDDOR" means the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995;

"ROGS" means the Railways and Other Guided Transport Systems (Safety) Regulations 2006;

"Route Acceptance" has the meaning given to such term in Railway Group Standard GE/RT8270, issue 2, dated October 2007;

"Routine Test" or "RT" has the meaning given to such term in paragraph 4 of Part A: (Testing and Inspection Requirements) of schedule 7 (Testing and Inspection), and Routine Testing shall be construed accordingly;

"RSCOM" means the Purchaser's rolling stock capex/opex model relating to the Base Order or any Whole Line Option which has been exercised by the Purchaser (as relevant), contractualised at the date of this Agreement and included in schedule 2 and contained on the DVD marked 'DTUP – MSA Schedule 2 Documents' and initialled by the Parties as at the date of this Agreement;

"RSSB" means the Rail Safety and Standards Board Limited, a company incorporated in England and Wales with registered number 04655675, and any successor body;

"RSTEM" means the Purchaser's rolling stock tender evaluation model relating to the Base Order or any Whole Line Option which has been exercised by the Purchaser (as relevant), contractualised at the date of this Agreement and included in schedule 2 and contained on the DVD marked DTUP – MSA Schedule 2 Documents' and initialled by the Parties as at the date of this Agreement;

"Rules" has the meaning given to such term in paragraph 14 of the form of the Advance Payment Bond;

"Safety Breach" means a breach of this Agreement caused by the gross incompetence, wilful default or reckless disregard to safety by the Manufacturer or any Subcontractor (or anyone employed or acting on behalf of the Manufacturer or any Subcontractor) which, in each case, has materially affected (or which has the potential to materially affect) the safe provision of the Works and/or the Services and/or services provided pursuant to this Agreement, the safe operation of the LUL Network and/or the safety of the Purchaser's customers, staff or any other person;

"Safety Breach Notice" has the meaning given to such term in clause 34.12;

"Safety Certificate" has the meaning given to such term in the ROGS;

"Safety Management System" has the meaning given to such term in the ROGS;

"Safety Obligations" means all applicable obligations concerning health and safety arising under Applicable Laws and Standards (including any duty of care arising at common law, and any obligation arising under statute, statutory instrument or mandatory code of practice in Great Britain or other applicable jurisdiction);

"Saloon Mock-up" means each Base Order Saloon Mock-up and/or WLO Saloon Mock-up, as the case may be;

"Schedule of Costs" means the schedule of costs included in Appendix 1 (Schedule of Costs) to schedule 12 (Change Procedure);

"Schedule of Milestones" means the document as set out in Appendix 1 (Schedule of Milestones) to Part B: (Milestones) of schedule 10 (Milestones and Security), or the relevant document set out in Appendix 2 to schedule 25 (Whole Line Options) as the case may be, as may be amended from time to time in accordance with this Agreement;

"Schedule of Payments" means the schedule of payments to be made by the Purchaser in respect of either:

- (a) a Change, such schedule of payments to be provided by the Manufacturer in accordance with paragraph 2.2(b) or 4.2(g) of Part B: (Purchaser Changes) of schedule 12 (Change Procedure) and containing the information specified in paragraph 7.1 of Part B: of schedule 12; or
- (b) a Compensation Event, such schedule of payments to be provided by the Manufacturer in accordance with paragraph 1.2(c) or 3.2(f) of Part D: (Compensation Changes) of schedule 12 (Change Procedure) and containing the information specified in paragraph 6.1 of Part D: of schedule 12;

"Schedule of Tests and Inspections" means the schedule of tests and inspections, based on the form set out in Part C: of schedule 7 (Testing and Inspection), which has been Approved pursuant to paragraph 1.4 of Part A: of schedule 7, as may be updated and Approved from time to time pursuant to paragraph 1 of Part A: of schedule 7;

"Scheduled Commencement Date" means, in relation to the Base Order, 22 November 2018 and, in relation to each Whole Line Option the relevant date set out in the related Whole Line Option Notice, or in each case such other date as may be agreed between the Parties for scheduled commencement of this Agreement or the scheduled effective date for the relevant Whole Line Option;

"Second ACS Date" means the date on which 60 per cent of the Overhaul Interval for the relevant type of ACS/Overhaul Component has elapsed;

"Security Interest" means any mortgage, charge (whether fixed or floating), encumbrance, pledge, lien, trust arrangement or other third party right or interest (legal or equitable) over or in respect of the relevant asset, security or right;

"Senior Representative" has the meaning given to such term in paragraph 2.2 of schedule 19 (Dispute Resolution Procedure);

"Service Affecting Failure" means the occurrence of a Technical Failure in relation to a Train, or the OTC - Infrastructure-Borne Equipment, which causes (in whole or in part):

- (a) a delay to that Train or any other train of 120 seconds or more (provided that when that Train reaches the terminal station for that journey as set out in the LUL Working Timetable, the clock will be reset to zero);
- (b) premature withdrawal of that Train or any other train from passenger service; or
- (c) a delay to that Train or any other train entering passenger service, or causes that Train or any other train not to enter passenger service, from a depot or siding,

excluding any Technical Failure:

- (i) that has been predicted to the Purchaser's maintenance organisation, with reasonable supporting evidence and in sufficient detail to enable resolution of the Technical Failure, at least 24 hours prior to that Technical Failure causing the passenger service delay or withdrawal from passenger service; or
- (ii) where the remote reporting and diagnostic facilities provided by the Manufacturer gives sufficient information to a member of the Purchaser's operational staff, at a location remote from the Train, that enables that member of staff to perform remote mitigation actions which would prevent a Technical Failure from otherwise delaying the passenger service by 120 seconds or more;

"Service Provider" means the Manufacturer in its capacity as party to, and provider of the Services pursuant to, the Fleet Support Agreement;

"Services" means the services provided or to be provided under the Fleet Support Agreement;

"Software" means any computer program installed in or on any Train, Equipment, Technical Document or Source Code or in equipment to be used in conjunction with, or for the operation, testing, commissioning, maintenance, investigation, modification and/or refurbishment of, any Purchased Items or any FSA Purchased Items and any computer program required to access, install, build or compile or otherwise use any such computer program including the access to and editing of any online/web-based Technical Documents, Source Code or Special Tools;

"SoS" means the Secretary of State for Transport from time to time or any successor to what are the current transport functions of the Secretary of State for Transport;

"Source Code" means, with respect to any Software, the source code version of that Software, being all logic, logic diagrams, flow charts, orthographic representations, algorithms, routines, sub-routines, utilities, models, file structures, coding sheets, coding, source codes, listings, functional specifications and program specifications and all other materials and documents necessary to enable a reasonably skilled programmer to maintain, amend and enhance that Software without reference to any other person or document, and whether in eye-readable or machine-readable form;

"Spare" means any Part which forms or will form part of any Train or Equipment and/or which is held, or will be held, in stock for fitting to Trains or Equipment and **"Spares"** shall be construed accordingly;

"Special Tool" means each Base Order Special Tool, each WLO Special Tool and/or any other special tool supplied or to be supplied by the Manufacturer under this Agreement, including all diagnostic software relating to all such items supplied under this Agreement and **"Special Tools"** shall be construed accordingly;

"Specially Designed IPR" means any IPR or Software specifically created by the Manufacturer (or by a Subcontractor or other third party on behalf of the Manufacturer) for the purposes of, or which arises from, a Joint Development, including:

- (a) any Manufacturer IPRs, Third Party IPRs or FSA IPRs that are embedded in or which are an integral part of such IPR or Software; and
- (b) any modifications or enhancements to Manufacturer IPR, Third Party IPR, FSA IPR or Software created specifically for the purposes of the Joint Development;

"Specified Standards" means, as the context may require, the standards listed in Sections 22.3 to 22.6 of the Train Technical Specification;

"Stalled Train Event" means a stalled train event described in Section 14.3 of the Train Technical Specification;

"Standards" means, as the context may require, all or any standards at any time or from time to time in force in the United Kingdom or the European Union and which are or may become applicable to this Agreement, any agreement or document referred to in this Agreement, any Purchased Item, the Training Services and/or the Manufacturer's obligations (including their performance) under this Agreement including, without prejudice to the generality of the foregoing, LUL Standards, British Standards, European Standards, International Standards and associated codes of practice, Railway Group Standards, the requirements of the ORR and ROGS;

"Subcontract" means any contract awarded by, or to be awarded by, the Manufacturer and any contract awarded by any person who is a party to a subcontract with the Manufacturer or awarded by any party to a subcontract with a Subcontractor, and so on, in relation to, or connected with, the carrying out of the obligations of the Manufacturer under this Agreement;

"Subcontractor" means any party to a Subcontract other than the Manufacturer and, for the avoidance of doubt, includes a Key Subcontractor;

"Substandard Condition" has the meaning given to such term in paragraph 10.1 of schedule 6 (Assurance);

"Substantial Modification" has the meaning given to such term in clause 33.4(a);

"Subsystems" means all of the subsystems of the Train, including each of the following:

- (a) bodyshell;
- (b) shoe gear;
- (c) traction system;
- (d) bogie and bogie equipment;
- (e) brakes and air supply;
- (f) electrical systems;
- (g) pipe and wire and general underframe equipment;
- (h) heating, ventilation and air-cooling equipment;
- (i) saloon doors;
- (j) passenger environment;
- (k) inter-vehicular connections;
- (l) cab external equipment;
- (m) cab internal equipment;
- (n) electronic and safety systems including Train-borne RCS S&TC, RCS OCS and TCMS;
- (o) mechanical systems;

- (p) audio/visual communication and train management equipment;
- (q) emergency equipment;
- (r) CCTV System;
- (s) selective door-opening and corrective sidedoor enabling systems;
- (t) exterior lighting; and
- (u) gangways;

"Suitable Lessor" means a person (other than a Competitor) that, in the Purchaser's reasonable opinion, has the capability to meet any payment obligations under this Agreement as may be transferred to it;

"Suspension Notice" has the meaning given to such term in clause 36.2(a);

"System Integration Management Plan" or **"SIMP"** means the DTUP System Integration Management Plan (Reference: NTfL-UIP2344.2.2-LUL-RPT-00001-01) that defines and documents the top level system and specialist engineering processes and methods that will be used by the Purchaser to facilitate the integration of Interfaces, projects (including the Project), PDPs and DTUP Systems;

"Taxes" means all present and future taxes, charges, imposts, duties or levies of any kind whatsoever, payable at the instance of or imposed by any Competent Authority, together with any penalties, additions, fines, surcharges or interest relating thereto and Tax and Taxation shall be construed accordingly;

"TCMS" means the Train Control and Management System, as further described in the Train Technical Specification;

"TCMS Simulator" means the TCMS simulator equipment, as more fully described in Section 15.5 of, and which meets all applicable requirements of, the Train Technical Specification;

"TDA Bid Cost" means the NPV of the track damage cost of a Train as set out in the relevant RSTEM relating to the 40-year design life of the Trains, being:

- (a) for the Base Order [REDACTED]
- (b) for the Bakerloo Line Fleet, [REDACTED]
- (c) for the Central Line Fleet, [REDACTED]
- (d) for the Waterloo & City Line Fleet, [REDACTED]

"TDA WLC Cost" means the track damage cost in GBP, being a combination of the measured performance of a particular Train on the Test Track Facilities and/or the measured performance calculated by computer assessment as set out in the relevant RSTEM in accordance with paragraph 3 of schedule 7 (Testing and Inspection);

"TECBAR" means the Technology and Construction Bar Association;

"Technical Change Control Process" has the meaning given to such term in paragraph 11 of schedule 5 (Contract Management);

"Technical Documents" means, in relation to a Fleet, all documents, drawings and data provided or to be provided by the Manufacturer to the Purchaser (in original or copy form

(as applicable)) and updated pursuant to the terms of this Agreement and at each Assurance Stage, including but not limited to:

- (a) the Plans;
- (b) copies of all Relevant Approvals and notices from Competent Authorities, the Purchaser and Network Rail (including the supporting information) and national alerts for safety that affect the Trains, their operation or maintenance;
- (c) all documentation provided or to be provided pursuant to the Assurance Regime;
- (d) all design documentation in respect of the Works and Design Submissions, including documentation relating to:
 - (i) the Saloon Mock-up;
 - (ii) the Train Driving Simulators; and
 - (iii) configuration management;
- (e) all testing documentation relating to the Trains and Equipment, including:
 - (i) the Testing and Inspection Strategy, the Schedule of Tests and Inspections and the Testing and Inspection Programme;
 - (ii) test specifications; and
 - (iii) test reports and results;
- (f) all documentation submitted pursuant to the Acceptance Criteria, including:
 - (i) authorisation from the ORR to place in service the Trains (and any other documentation required pursuant to ROGS);
 - (ii) the "as-built" design information in relation to the Trains (including calculations and modelling);
 - (iii) the Manuals;
 - (iv) the Train Maintenance Regime; and
 - (v) the Training Materials;
- (g) all documents, appraisals and notices submitted pursuant to the Change Procedure including any Modifications or Mandatory Modifications and any other approvals and certificates in relation to any Modifications;
- (h) all reports, reviews, plans and strategies in relation to the performance and progress of the Project provided or to be provided pursuant to schedule 5 (Contract Management) including any reports, data and other relevant material in connection with the technical advice provided by the Manufacturer pursuant to paragraph 14 of schedule 5;
- (i) all documents listed in paragraph 18 of schedule 28 (Technical Information); and
- (j) all documents relating to Quality Standards;

"Technical Failure" means any loss of ability of a system, function, piece of equipment or Part to perform which impacts on the performance of the Train or Equipment, or which requires investigation, replacement or repair;

"Technical Library" means the online resource made available by the Manufacturer to the Purchaser containing all up to date versions of all of the Technical Documents;

"Technical Principles Document" has the meaning given in paragraph 1.6 of schedule 28 (Technical Information);

"Termination Date" means the date upon which this Agreement is terminated in accordance with its terms;

"Test" means to prove correct operation by trial, and **"Testing"** shall be construed accordingly;

"Test Service Affecting Failure" means the occurrence of a Technical Failure in relation to a Train, or the OTC - Infrastructure-Borne Equipment, which causes or would cause (in whole or in part):

- (a) without intervention or remedial action by the Manufacturer's staff, a delay of 120 seconds or more to any Train;
- (b) premature withdrawal of any Train from testing; or
- (c) any Train not to be used for testing;

"Test Track Facilities" means the test facilities at Siemens Mobility GmbH, Test and Validation Center, Friedrich-List-Allee 1, 41844 Wegberg-Wildenrath, Germany for testing the Trains and Subsystems and for systems integration testing away from the LUL Network, which simulate both the conditions of the relevant parts of the LUL Network and the operation of the LUL Working Timetable, access to which is to be procured by the Manufacturer as further described in the Appendix to Part A: of schedule 7 (Testing and Inspection), such facilities to include the following characteristics:

- (a) third and fourth-rail traction supply;
- (b) permit operation of the Trains at up to 110km/h;
- (c) the Test Track Facilities Integration Equipment that the Purchaser has made available pursuant to clause 14.2(a)(iii) having been installed;
- (d) permit a full range of dynamic tests, including traction and braking tests required to demonstrate compatibility and compliance with the Train Technical Requirements;
- (e) permit execution of the test specifications developed by the Manufacturer in accordance with the Testing and Inspection Strategy, Schedule of Tests and Inspections and Testing and Inspection Programme;
- (f) permit observation of the tests in a safe environment by, without limitation, the Purchaser (and/or any nominees or representatives of the Purchaser) and personnel responsible for the interfacing systems; and
- (g) a track layout sufficient to enable intensive mileage accumulation and reliability development activities,

provided or to be provided by the Manufacturer;

"Test Track Facilities Integration Equipment" means the equipment procured by the Purchaser to be installed at the Test Track Facilities to enable the integration testing of the Trains with interfacing assets, as further described in the Appendix to Part A: of schedule 7 (Testing and Inspection);

"Testing and Inspection Programme" means the testing and inspection programme, based on the form set out in Part D: of schedule 7 (Testing and Inspection), which has been Approved pursuant to paragraph 1.4 of Part A: of schedule 7, as may be updated and Approved from time to time pursuant to paragraph 1 of Part A: of schedule 7;

"Testing and Inspection Requirements" means the requirements with regard to the testing of Trains set out in Part A: (Testing and Inspection Requirements) of schedule 7 (Testing and Inspection);

"Testing and Inspection Strategy" means the testing and inspection strategy, based on the form set out in Part D: of schedule 7 (Testing and Inspection), which has been Approved pursuant to paragraph 1.4 of Part A: of schedule 7, as may be updated and Approved from time to time pursuant to paragraph 1 of Part A: of schedule 7;

"TfL Corporate Environment Framework" means the TfL Corporate Environment Framework set out in Appendix 5 to schedule 16 (Health, Safety and Environment) as updated from time to time;

"TfL Group" means Transport for London and any member of its Group;

"TfL Period" means each consecutive 28 day period, the first of which starts on 1 April in each year and, in respect of the first or last such period in any year, as may be varied by TfL;

"Third ACS Date" means the date on which 90 per cent of the Overhaul Interval for the relevant type of ACS/Overhaul Component has elapsed;

"Third Party IPR" means IPR, whether existing at the date of this Agreement or arising hereafter, other than Corporate IPR or the Manufacturer IPR;

"Third to Fifth Pre-PAC Trains" means the three Trains in the relevant Fleet that achieve Pre-Provisional Acceptance after the First and Second Pre-PAC Trains, and before any other Trains in that Fleet;

"Total Contract Price" means the amount specified in the final row of the table set out in Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) as the Total Contract Price of the Purchased Items comprising the Base Order, related provision of facilities and Test Track Facilities and ACS Services for the Base Order, as such amount is amended from time to time pursuant to clause 6.18 and as such amount may be adjusted in accordance with clause 20.10 and any Change Confirmation Notice or Claim Confirmation Notice;

"Track Damage Assessment" or "TDA" means an assessment carried out in accordance with paragraph 3 of Part A: of schedule 7 (Testing and Inspection) which calculates the cost of track wear and damage caused by a Train to the track, thereby allowing measurement of the difference in cost between (i) the TDA WLC Cost; and (ii) the TDA Bid Cost, using:

- (a) the Manufacturer Train Proposal and the Manufacturer's design documentation; and
- (b) the Track Damage Assessment Model;

"Track Damage Assessment Model" means the track damage elements of the relevant RSTEM;

"Train" means a Base Order Train, a Bakerloo Line Train, a Central Line Train and/or a Waterloo & City Line Train as the case may be;

"Train and Equipment Design" means the design of the Trains and Equipment from time to time in accordance with the requirements of this Agreement;

"Train-Borne Signalling" means the systems and interfaces relating to train-borne-signalling for each Train including but not limited to the following systems and interfaces set out in Appendix 1 to schedule 26:

- (a) Train-borne RCS S&TC Antenna;
- (b) Balise Reader;
- (c) Train-borne Automatic Train Protection (ATP);
- (d) Train-borne Automatic Train Operation (ATO);
- (e) Train-borne RCS OCS;
- (f) Train-borne RCS OCS Antenna; and
- (g) GoA2 Train-borne position verification;

"Train Capital Cost" means, depending on the relevant Fleet, the capital cost of:

- (a) one Base Order Train as set out in Appendix 2 to Part B: of schedule 10 (Milestones and Security), [REDACTED]
- (b) one Bakerloo Line Train as set out in paragraph 1.1 of Appendix 3 to schedule 25 (Whole Line Options), [REDACTED]
- (c) one Central Line Train as set out in paragraph 1.2 of Appendix 3 to schedule 25 (Whole Line Options), being [REDACTED] or
- (d) one Waterloo & City Line Train as set out in paragraph 1.3 of Appendix 3 to schedule 25 (Whole Line Options), being [REDACTED] per Train,

as the case may be;

"Train Control and Management System" has the meaning given to such term in the Train Technical Specification;

"Train Data" means all data produced by the Trains or Equipment;

"Train Driving Simulator" means a train driving simulator supplied or to be supplied under this Agreement which complies with all of the requirements of Section 20 of the Train Technical Specification, the Manufacturer Train Proposal and the requirements of clause 6.3;

"Train Driving Simulator Acceptance Date" means, in relation to a Train Driving Simulator, the intended date of issue of an Equipment Acceptance Certificate for such Train Driving Simulator as set out in the Key Programme Dates;

"Train Driving Simulator Locations" has the meaning given to such term in clause 6.3;

"Train Driving Simulator Logbook" means a document supplied or to be supplied by the Manufacturer with, and relating to, each Train Driving Simulator and which shall include the following:

- (a) build records including technical data such as reference sheets for build records, dimensional and setting checks and signed-off inspection and documentation;
- (b) equipment serialisation of part-numbered major components of the Train Driving Simulator (including mechanical, pneumatic and electrical items and any other items agreed between the Parties) and configuration charts;
- (c) records of maintenance carried out by the Manufacturer prior to Approval;
- (d) the status of Modifications;
- (e) records of hardware and Software version numbers; and
- (f) status of fleet checks applicable to that Train Driving Simulator,

and in the case of paragraphs (b) to (f) above, in a form which is suitable for import into the LUL Database;

"Train Features" has the meaning given to such term in clause 29.5(a);

"Train Financial Models" means the:

- (a) Energy Consumption Model;
- (b) Track Damage Assessment Model;
- (c) each RSTEM; and
- (d) each RSCOM;

"Train Logbook" means a document supplied or to be supplied by the Manufacturer with, and relating to, each Train which shall be an accurate record of each Train and shall include the following:

- (a) build records including technical data such as reference sheets for build records, dimensional and setting checks and signed-off inspection and documentation for the following tests (in accordance with schedule 7 (Testing and Inspection):
 - (i) First Article Inspections;
 - (ii) Type Tests;
 - (iii) Routine Tests;
 - (iv) Maintainability Demonstration Testing;
 - (v) Customer Acceptance Testing;
 - (vi) Integration Testing;
 - (vii) Endurance Running;
 - (viii) Depot/Train Integration Testing; and
 - (ix) LUL Network Testing;
- (b) asset numbers for each Train, safety critical components, Major Components and Line Replaceable Units in accordance with the Train Technical Specification;
- (c) Routine Test certificates and test result sheets;

- (d) Type Test certificates, associated test result sheets and reports;
- (e) Final Test certificates and test result sheet;
- (f) radiographic/non-destructive testing (NDT) records;
- (g) equipment serialisation of serial-numbered Major Components and Parts (including mechanical, pneumatic and electrical items and any other items agreed between the Parties as requiring serialisation);
- (h) inspection sheets of Major Components as Approved by the Purchaser;
- (i) records of maintenance carried out by the Manufacturer prior to Acceptance;
- (j) the status of Modifications;
- (k) records of hardware and software version numbers and configuration levels;
- (l) pre and post-delivery commissioning test certificates;
- (m) reliability demonstration endurance testing result sheets;
- (n) copies of all relevant non-conformance reports and corrective action reports indicating how and when the relevant issues were resolved; and
- (o) other relevant information as required by the Purchaser,

and in the case of paragraphs (b) to (o) above, in a form which is suitable for import into the LUL Database;

"Train Longstop Date" means, in respect of any Train, the date 12 months after the date set out for Provisional Acceptance of that Train in the relevant Key Programme Dates;

"Train Maintenance Cost" has the meaning given to such term in clause 15.15(a);

"Train Maintenance Plan" means the maintenance plan for the Trains and Equipment, as described in paragraph 3 of schedule 28 (Technical Information);

"Train Maintenance Regime" means the maintenance regime for the Trains and Equipment described in clause 13;

"Train Parameters" means the details of the Train set out in paragraphs 10 and 18.3 to 18.5 of schedule 28 (Technical Information);

"Train Radio" means the train radio system described in Section 2.14 of the Train Technical Specification;

"Train Support Software" has the meaning given to such term in clause 29.10(c);

"Train Technical Requirements" means together the Train Technical Specification and the Manufacturer Train Proposal;

"Train Technical Specification" means the requirements for each Train and item of Equipment set out in schedule 1 (Train Technical Specification);

"Train Warranty Period" means, for each Fleet, the period commencing on the date of Provisional Acceptance or Qualified Provisional Acceptance (whichever occurs first) of the first Train in each Fleet and ending in respect of that Fleet on the later to occur of:

(a) the date that is two (2) years after the date of Provisional Acceptance or Qualified Provisional Acceptance (whichever occurs first) of the last Train in that Fleet (excluding any Base Order Option Trains or WLO Additional Trains as applicable); and

(b) the date set out in clause 7.15(g),

and for the purposes of this Agreement any reference to the supply of Spares or Consumables during or for **"the whole of the Train Warranty Period"** shall be deemed to include the supply of Spares or Consumables lasting for the 12 month period following the end of the Train Warranty Period as described in clause 7.15(f);

"Training Course" means one training (or learning) module, or a series of training (or learning) modules that are sequential and thematically integrated within an area of subject matter;

"Training Materials" has the meaning given to such term in paragraph 7.1 of schedule 4 (Training);

"Training Module" means one or more training (or learning) units within a specific Training Course. The training (or learning) units shall normally comprise a number of training (or learning) outcomes that are combined thematically by means of their relationship with one another;

"Training Needs Analysis" means the formal identification, carried out pursuant to paragraph 4 of schedule 4 (Training), of the training needs of groups of the Purchaser's personnel based on the requirements for knowledge and skills relating to the Trains and Equipment and any other asset(s) and system(s) supplied or to be supplied, and the identification of any current or anticipated gaps in knowledge and skills of such personnel;

"Training Philosophy" means the London Underground New Tube for London Training Philosophy (document reference: NTfL-2344.1.1-LUL-RPT-00007) in agreed form on the date of this Agreement;

"Training Plan" means a document prepared or to be prepared by the Manufacturer detailing the training to be provided for a specific training course pursuant to Section 3.3 of the Training Philosophy;

"Training Programme" has the meaning given to such term in paragraph 3.1 of schedule 4 (Training);

"Training Services" means the Base Order Training Services, the Bakerloo Line Training Services, the Central Line Training Services and/or the Waterloo & City Line Training Services, as the case may be;

"Transparency Commitment" means the Local Government Transparency Code issued by the Department for Communities and Local Government in May 2014 in accordance with which the Purchaser publishes its contracts, tender documents and data from invoices received, as the same may be amended from time to time;

"Transport for London" or **"TfL"** means the body established pursuant to section 154 of the Greater London Authority Act 1999 and any successor body;

"Type Tests" means testing carried out by or on behalf of the Manufacturer on one or more components, Subsystems, systems, vehicles or Trains, to demonstrate the compliance of that item with the relevant requirements of this Agreement, and in such a manner that the test may be regarded as representative of all items of that type and shall include the Energy Consumption Test and the Track Damage Assessment, and **"Type Testing"** shall be construed accordingly;

"Undesirable Transferee" means:

- (a) any person who is Insolvent; or
- (b) any person:
 - (i) who has been convicted of a criminal offence or a series of offences, or is the subject of ongoing investigation, inquiry or regulatory or judicial proceedings (including in relation to any breach of health and safety laws) in the five (5) years preceding the date of the notice issued by the Manufacturer pursuant to clause 46.2(a);
 - (ii) whom it would be reasonable for a contracting authority to exclude from consideration on grounds of national security;
 - (iii) from a country which is, or who is otherwise, the subject of economic or security sanctions imposed by the United Kingdom (including sanctions which take the form of the prevention of the supply of goods or services to the country or restrictions on the freedom of movement of diplomats and/or consular personnel of that country) whether the sanctions are in full force or suspended; or
 - (iv) who has an Affiliate that falls within paragraphs (b)(i) to (iii) above;

"Uninsurable" has the meaning given to such term in paragraph 16.3 of Part A: of schedule 13 (Insurance);

"Uninsured Loss" means that the relevant Losses are not recoverable under the Required Insurances to be taken out by the Manufacturer in accordance with schedule 13 (Insurance) (assuming that such Required Insurances have been taken out and maintained in force as required by schedule 13 and taking no account of any Losses which are not recoverable as a result of any excess or deductible under any such policy of insurance);

"Unrestricted Passenger Revenue Earning Service" means the operation without restriction of a Train on the relevant parts of the LUL Network in connection with the carriage of passengers by railway;

"Utilities Contracts Regulations" means the Utilities Contracts Regulations 2016 (SI 2016/274);

"VAT" means value added tax as provided for in the Value Added Tax Act 1994 and legislation supplemental thereto and any similar sales, consumption or turnover tax replacing or introduced in addition thereto;

"Warranty Spares" means the Base Order Warranty Spares, the Bakerloo Line Warranty Spares, the Central Line Warranty Spares, and/or the Waterloo & City Line Warranty Spares, as the case may be;

"Water Technology List" means the Water Technology List contained at: http://wtl.defra.gov.uk/product_search_landing.asp?section=66&itemTitle=Product+Search;

"Waterloo & City Line Additional Cab Conversion Unit" means any supplementary WLO Cab Conversion Unit supplied or to be supplied by the Manufacturer pursuant to the exercise of a WLO Additional Trains Option Notice pursuant to clause 6.7(b)(iv);

"Waterloo & City Line Additional Train" means each one of a maximum of 2 additional Waterloo & City Line Trains supplied or to be supplied by the Manufacturer pursuant to the

exercise of a WLO Additional Trains Option Notice pursuant to clause 6.7(b)(i) and **"Waterloo & City Line Additional Trains"** shall be construed accordingly;

"Waterloo & City Line Base Order" means the items supplied or to be supplied by the Manufacturer for the purposes of the Whole Line Option exercised in relation to the Waterloo & City Line, comprising the items listed in paragraph 4.1(c) of schedule 25 (Whole Line Options) as amended by the Purchaser in the relevant Whole Line Option Notice;

"Waterloo & City Line Cab Conversion Unit" means the equipment to enable the Purchaser to convert both of the driving cabs on any Waterloo & City Line Train to usable passenger space as required by Section 6.1 of the Train Technical Specification;

"Waterloo & City Line Equipment" means:

- (a) one (1) Train Driving Simulator;
- (b) the Waterloo & City Line Warranty Spares;
- (c) the Waterloo & City Line Purchaser Fault Spares;
- (d) the Waterloo & City Line Maintenance Spares;
- (e) the Waterloo & City Line Special Tools;
- (f) one (1) Waterloo & City Line Saloon Mock-up;
- (g) the Waterloo & City Line Non-Standard Tools;
- (h) the OTC - Infrastructure-Borne Equipment for the Waterloo & City Line;
- (i) one (1) Waterloo & City Line Cab Conversion Unit; and
- (j) one (1) set of Automatic Lineside Inspection Equipment;

"Waterloo & City Line Maintenance Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the Purchaser to carry out routine maintenance on the Waterloo & City Line Trains and Waterloo & City Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Waterloo & City Line Spares) of Appendix 7 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Waterloo & City Line Maintenance Spare"** shall mean any one of them;

"Waterloo & City Line Non-Standard Tools" means those tools that are readily available from tool retailers which are not listed in LU reference document DTP-UIP1973-1.5-RPT-00048 "Depot Standard Tooling List" including all of the items listed in Part C: of Appendix 7 to schedule 25 (Whole Line Options) for the Waterloo & City Line Base Order as amended pursuant to the process in clause 6.10(g), and **"Waterloo & City Line Non-Standard Tool"** shall mean any one of them;

"Waterloo & City Line Purchaser Depot Works" means the Purchaser Depot Works in relation to the Waterloo & City Line set out in Part C: (Waterloo & City Line Purchaser Depot Works) of Appendix 1 to schedule 25 (Whole Line Options);

"Waterloo & City Line Purchaser Fault Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the rectification of Purchaser Faults on the Waterloo & City Line Trains and Waterloo & City Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: (Waterloo & City Line Spares) of Appendix 7 to schedule

25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Waterloo & City Line Purchaser Fault Spare"** shall mean any one of them;

"Waterloo & City Line Saloon Mock-up" means the mock-up of the saloon of a Waterloo & City Line Train, to be delivered by the Manufacturer in accordance with the Train Technical Requirements and the terms of this Agreement (including clause 10.4 as amended by schedule 25 (Whole Line Options)) as further described in Section 2.2 of the Train Technical Specification;

"Waterloo & City Line Spares" means the Waterloo & City Line Warranty Spares, the Waterloo & City Line Purchaser Fault Spares and the Waterloo & City Line Maintenance Spares and **"Waterloo & City Line Spare"** shall mean any one of them;

"Waterloo & City Line Special Tools" means those tools which are not readily available from generally available tool suppliers and include, but are not limited to, all of the items listed in Part B: (Base Order Special Tools) of Appendix 7 to schedule 25 (Whole Line Options) as amended for the Waterloo & City Line Base Order as amended pursuant to the process in clause 6.10(g), and **"Waterloo & City Line Special Tool"** shall mean any one of them;

"Waterloo & City Line Train" means each Train supplied or to be supplied under this Agreement for the Waterloo & City Line (on exercise of the relevant Whole Line Option) which complies with all of the general requirements of the Train Technical Requirements together with all of the specific requirements for the Waterloo & City Line set out in the Train Technical Requirements and, except where expressly excluded, includes a Waterloo & City Line Additional Train;

"Waterloo & City Line Training Services" means those training services provided or to be provided by the Manufacturer in relation to the Whole Line Option exercised in relation to the Waterloo & City Line pursuant to clause 12 (Training Services) as amended by schedule 25 (Whole Line Options) and as set out in the Training Programme for that Whole Line Option;

"Waterloo & City Line Warranty Spares" means the pool of Spares and Consumables supplied or to be supplied by the Manufacturer for the carrying out of warranty work on the Waterloo & City Line Trains and Waterloo & City Line Equipment for the whole of the Train Warranty Period in accordance with the Train Maintenance Regime as described in Part A: of Appendix 5 to schedule 25 (Whole Line Options) as amended pursuant to the process in clause 6.10(g) and **"Waterloo & City Line Warranty Spare"** shall mean any one of them;

"Whole Line Option" means each option to purchase additional Trains and/or Equipment for use on (i) the Bakerloo Line; (ii) the Central Line; or (iii) the Waterloo & City Line as more particularly described in clauses 6.7 to 6.18 and schedule 25 (Whole Line Options) (and these do not form part of the Base Order);

"Whole Line Option Notice" has the meaning given to such term in clause 6.14;

"Whole Line Option Notice Cut-off Date" means, for each Whole Line Option, the relevant date set out in the table in clause 6.8, being the date by which the Purchaser shall determine whether to exercise the relevant Whole Line Option;

"Whole Line Option Notice Exercise Date" means for each Whole Line Option the date referred to in clause 6.14;

"WLO Additional Cab Conversion Units" means any Bakerloo Line Additional Cab Conversion Unit, Central Line Additional Cab Conversion Unit and/or Waterloo & City Line Additional Cab Conversion Unit supplied or to be supplied by the Manufacturer pursuant to

the exercise of a WLO Additional Trains Change by the Purchaser in accordance with clause 6.7(b)(iv);

"WLO Additional Spares/Special Tools Notice" means a notice on the terms set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser to the Manufacturer stating the quantities of WLO Additional Spares and/or WLO Additional Special Tools required;

"WLO Additional Spares" means supplementary WLO Spares supplied or to be supplied by the Manufacturer in connection with the exercise of a WLO Additional Trains Change by the Purchaser in accordance with clause 6.7;

"WLO Additional Special Tools" means supplementary WLO Special Tools supplied or to be supplied by the Manufacturer in connection with the exercise of a WLO Additional Trains Change by the Purchaser in accordance with clause 6.7(c);

"WLO Additional Train Driving Simulator" means any supplementary WLO Train Driving Simulators supplied or to be supplied pursuant to the exercise of a WLO Additional Trains Change by the Purchaser in accordance with clause 6.7(b)(iii);

"WLO Additional Trains" means the Bakerloo Line Additional Trains, Bakerloo Line Extension Trains, Central Line Additional Trains and/or Waterloo & City Line Additional Trains supplied or to be supplied by the Manufacturer pursuant to the exercise of a WLO Additional Trains Change by the Purchaser in accordance with clause 6.7(b)(i) or (in the case of Bakerloo Line Extension Trains only) clause 6.7(b)(ii);

"WLO Additional Trains Change" means a Purchaser Change exercised in accordance with clauses 6.7(b)(i), 6.7(b)(ii), 6.7(b)(iii) or 6.7(b)(iv) which requires WLO Additional Trains, WLO Additional Train Driving Simulators and/or WLO Additional Cab Conversion Units to be manufactured, tested, commissioned and delivered in accordance with the terms of this Agreement;

"WLO Additional Trains Option Notice" means a notice on the terms set out in Part A: of schedule 21 (Pro Forma Certificates) issued by the Purchaser to procure WLO Additional Trains, WLO Additional Train Driving Simulators and/or WLO Additional Cab Conversion Units;

"WLO Additional Trains Option Price(s)" means the prices in respect of each Option as set out in each Table 1 of paragraph 1, 2 or 3 of Appendix 4 to schedule 25 (Whole Line Options);

"WLO Base Order" has the meaning given to such term in paragraph 4.1 of schedule 25 (Whole Line Options);

"WLO Break in Production Date" means, for each Whole Line Option, the relevant date set out in the table in clause 6.8 after which exercise by the Purchaser of the relevant Whole Line Option will incur a Remobilisation Payment in relation to that Whole Line Option on the terms set out in Appendix 3 to schedule 25 (Whole Line Options);

"WLO Cab Conversion Unit" means any Bakerloo Line Cab Conversion Unit, Central Line Cab Conversion Unit and/or Waterloo & City Line Cab Conversion Unit, depending on the relevant Whole Line Option to which the Train relates;

"WLO Contract Price" means, for each Whole Line Option, the amount specified in the penultimate row of column (2) of the table for the Purchased Items comprising the relevant Whole Line Option in Appendix 3 to schedule 25 (Whole Line Options);

"WLO Equipment" means the Bakerloo Line Equipment, Central Line Equipment and/or Waterloo & City Line Equipment as the case may be, depending on the relevant Whole Line option to which the Equipment relates;

"WLO Interim Milestone Payments" has the meaning given to such term in paragraph 2.3(a) of schedule 25 (Whole Line Options);

"WLO Key Programme Dates" means the supplement to the Key Programme Dates for the relevant Whole Line Option in the same form as the Key Programme Dates, the final version of which is delivered in relation to each Whole Line Option pursuant to clause 6.10 as amended by schedule 25 (Whole Line Options) and as a condition precedent to the Commencement Date of the relevant Whole Line Option;

"WLO Non-Standard Tool" means a Bakerloo Line Non-Standard Tool, a Central Line Non-Standard Tool and/or a Waterloo & City Line Non-Standard Tool as the case may be, depending on the relevant Whole Line Option to which the Non-Standard Tool relates;

"WLO Project Programme" means the supplement to the Project Programme for the relevant Whole Line Option, based on the Project Programme for the relevant Whole Line Option set out in schedule 25 (Whole Line Options), the final version of which is delivered in relation to each Whole Line Option pursuant to clause 6.10 as amended by schedule 25 (Whole Line Options) and as a condition precedent to the Commencement Date of the relevant Whole Line Option;

"WLO Purchased Item" means any item forming part of the Bakerloo Line Base Order, the Central Line Base Order and/or the Waterloo & City Line Base Order as the case may be each as set out in clause 6 as amended by schedule 25 (Whole Line Options), depending on the relevant Whole Line Option;

"WLO Saloon Mock-up" means each mock-up of parts of a WLO Train, to be delivered by the Manufacturer in accordance with the Train Technical Requirements and the terms of this Agreement as further described in Section 1.9 of the Train Technical Specification;

"WLO Spare" means a Bakerloo Line Spare, a Central Line Spare and/or a Waterloo & City Line Spare, as the case may be, depending on the relevant Whole Line Option to which the Spare relates;

"WLO Special Tool" means a Bakerloo Line Special Tool, a Central Line Special Tool and/or a Waterloo & City Line Special Tool, as the case may be, depending on the relevant Whole Line Option to which the Special Tool relates;

"WLO Train" means a Bakerloo Line Train, a Central Line Train and/or a Waterloo & City Line Train as the case may be, depending on the relevant Whole Line Option to which the Train relates;

"WLO Train Driving Simulator" means a Train Driving Simulator to be procured pursuant to the exercise of a Whole Line Option by the Purchaser in clause 6.7;

"Working Day" means a weekday (other than a Saturday or Sunday) on which banks are open for domestic business in the City of London;

"Works" means the design, manufacture, testing, commissioning, integration and supply of the Trains and Equipment (and any temporary works undertaken by the Manufacturer or its Subcontractors at any Designated Depot to facilitate Train and Equipment Acceptance as agreed with the Purchaser) carried out pursuant to the terms of this Agreement and in accordance with the Train Technical Requirements; and

"Yellow Book" means Engineering Safety Management (the Yellow Book): Fundamentals and Guidance, Issue 4.

1.2 Interpretation

In this Agreement, except where the context otherwise requires:

- (a) any reference to this Agreement includes the schedules, Appendices and Annexes to it, each of which forms part of this Agreement for all purposes;
- (b) a reference to an enactment or statutory provision shall, unless otherwise expressly specified in this Agreement, include:
 - (i) a reference to any subordinate legislation made under the relevant enactment or statutory provision whether before or after the date of this Agreement; and
 - (ii) be a reference to that enactment, statutory provision or subordinate legislation as from time to time amended, consolidated, modified, re-enacted or replaced, whether before or after the date of this Agreement;
- (c) words importing the singular only shall include the plural and vice versa;
- (d) references to one gender include other genders;
- (e) a reference to a person shall include a reference to a firm, a body corporate, an unincorporated association, a partnership, limited partnership, limited liability partnership or to that person's legal personal representatives, successors and permitted assignees;
- (f) a reference to a clause or schedule (other than to a schedule to a statutory provision), paragraph, Part, Appendix or Annex shall be a reference to a clause, schedule, paragraph, part, appendix or annex (as the case may be) of or to this Agreement and a reference in a schedule to a Part, paragraph, Annex or Appendix shall mean references to a part, paragraph, annex or appendix of that schedule;
- (g) if a period of time is specified as from or within a given day, or from or within the day of an act or event, it shall be calculated exclusive of that day;
- (h) references to any English legal term for any action, remedy, method of judicial proceeding, legal document, legal status, court, official or any legal concept or thing shall in respect of any jurisdiction other than England be deemed to include what most nearly approximates the English legal term in that jurisdiction and references to any English statute or enactment shall be deemed to include any equivalent or analogous laws or rules in any other jurisdiction;
- (i) references to writing shall include any modes of reproducing words in any legible form and shall exclude email and any other form of electronic communication except where expressly stated otherwise;
- (j) a reference to includes or including is to be construed as includes without limitation or including without limitation;
- (k) the contents page and headings in this Agreement are for convenience only and shall not affect its interpretation;
- (l) references to this Agreement or any other agreement or document include permitted variations, amendments, replacements, novations or supplements to this Agreement or other agreement or document (as the case may be);

- (m) words and expressions defined in the Railways Act 1993 shall, unless otherwise defined in this Agreement or unless the context otherwise requires, have the same meaning in this Agreement;
- (n) a reference to the Purchaser or the Manufacturer includes their respective (and any subsequent) successor(s) in title, and their respective permitted transferee(s) or assignee(s);
- (o) any obligation on any Party to do or not to do anything shall be deemed to include an obligation to procure or not to permit or suffer such things to be done by such Party's agents, servants, contractors and subcontractors of any tier and acts or omissions of either Party's agents, servants, contractors or subcontractors of any tier shall be deemed to be acts of such Party for the purposes of this Agreement;
- (p) references to costs, expenses and losses which are to be indemnified to, or recovered by, the person incurring the same shall be construed as references to an amount equal to the amount of such costs, expenses and losses together with any amount that represents VAT or other similar tax properly chargeable therein in any jurisdiction;
- (q) amounts stated or expressed in this Agreement to be "Indexed" shall be references to such amounts at Indexation Base Month prices multiplied by:

$$\frac{RPI_t}{RPI_{Base}}$$

where:

- (i) **RPI_t** is the value of RPI most recently published prior to the relevant calculation date; and
- (ii) **RPI_{Base}** is the value of RPI for April 2015 published in May 2015;
- (r) reference to a third party is a reference to any person who is not a Party;
- (s) a reference to any agreement or other document in the agreed form shall be deemed to be a reference to that agreement or document in the form which has been accepted by each of the Purchaser and the Manufacturer and initialled on behalf of each such Party for the purposes of identification;
- (t) references to otherwise and words following other shall not be limited by any foregoing words where a wider construction is possible; and
- (u) a reference to provisions of this Agreement expressed as being from one provision to another provision shall be construed as including both mentioned provisions.

2. COMMENCEMENT AND CONDITIONS PRECEDENT

2.1 Immediately Effective Clauses

The rights and obligations of the Parties arising under the Immediately Effective Clauses shall be of immediate effect upon execution by the last Party to execute this Agreement.

2.2 Conditions Precedent to Commencement

The rights and obligations of the Parties under this Agreement (other than the rights and obligations arising under the Immediately Effective Clauses) shall be conditional upon satisfaction or waiver of the conditions set out in clauses 2.3 and 2.4, and shall come into

effect upon the Commencement Date as specified in the relevant Certificate of Commencement.

2.3 **Manufacturer Conditions Precedent**

The Manufacturer shall provide to the Purchaser:

- (a) the Guarantee duly executed by the Guarantor;
- (b) an Advance Payment Bond for the Initial APB Bond Amount, which is duly executed by an Advance Payment Bond Provider and which complies with the provisions of paragraphs 1.1 and 1.2 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);
- (c) the Fleet Support Agreement duly executed by the Service Provider and such document having become unconditional in all respects (save for any condition relating to this Agreement coming into full force and effect);
- (d) the Escrow Agreement duly executed by the Manufacturer and the Escrow Agent and such document having become unconditional in all respects (save for any condition relating to this Agreement coming into full force and effect);
- (e) a certified copy of:
 - (i) a resolution of the board of directors of the Manufacturer (in a form and substance satisfactory to the Purchaser) passed at a duly convened and held meeting:
 - (A) approving the terms of, and the transactions contemplated by, this Agreement and all the other related documents to which it is a party; and
 - (B) authorising a specified person to approve amendments to, and execute, this Agreement and all the other related documents to which it is a party;
 - (ii) a list of authorised signatories of the Guarantor issued by the Guarantor authorising the persons named therein to act on its behalf as stated therein; and
 - (iii) certified copies of the most recent:
 - (A) statutory audited accounts;
 - (B) certificate of incorporation on name change; and
 - (C) articles of association,in respect of the Manufacturer;
 - (iv) certified copies of the most recent:
 - (A) statutory audited accounts;
 - (B) abstract from the Company Register; and
 - (C) articles of association,in respect of the Guarantor;

- (f) a legal opinion (in a form and substance satisfactory to the Purchaser) that the Guarantor has the requisite power and authority to execute the Guarantee and that, following such execution, the terms of the Guarantee will be binding on and enforceable against the Guarantor;
- (g) evidence that the Required Insurances required under Part A: and Part B: of schedule 13 (Insurance) are in full force and effect and a letter of undertaking in the form set out in Part D: (Broker's Letter of Undertaking) to schedule 13 (Insurance); and
- (h) populated versions of paragraph 1.1 of Part A: (Initial Advance Payment Bond), Appendix 1 (Schedule of Milestones) to Part B: (Milestones) and Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) pursuant to clause 2.7(e).

The Manufacturer shall use its reasonable endeavours to procure that the conditions referred to in this clause 2.3 are satisfied on or before the Scheduled Commencement Date.

2.4 **Purchaser Condition Precedent**

The Purchaser shall provide to the Manufacturer a certified copy of the board papers of the Purchaser:

- (a) approving the terms of, and the transactions contemplated by, this Agreement and all the other related documents to which it is a party; and
- (b) authorising a specified person or persons to approve amendments to, and execute, this Agreement and all the other related documents to which it is a party.

The Purchaser shall use its reasonable endeavours to procure that the condition referred to in this clause 2.4 is satisfied on or before the Scheduled Commencement Date.

2.5 **Waiver**

- (a) The Purchaser may, by written notice to the Manufacturer, waive any condition precedent specified in clause 2.3 in whole or in part.
- (b) The Manufacturer may, by written notice to the Purchaser, waive the condition precedent specified in clause 2.4 in whole or in part.

2.6 **Certificate of Commencement**

Once the Purchaser is satisfied that each of the conditions precedent set out in clauses 2.3 and 2.4 have been satisfied (except to the extent waived or deferred by the Purchaser) then the Purchaser shall issue to the Manufacturer a Certificate of Commencement, which shall specify the Commencement Date for the Base Order, such date being no earlier than the Scheduled Commencement Date.

2.7 **Foreign Exchange**

- (a) The Parties agree that the prices listed in Part A: of schedule 24 (Foreign Exchange) (the "**Interim Milestone Payments**") will, subject only to adjustment in accordance with the application of the Financial Close Protocol, become the Milestone Payments, the APB Bond Amounts and the Total Contract Price to be set out in paragraph 1.1 of Part A: (Initial Advance Payment Bond), Appendix 1 (Schedule of Milestones) to Part B: (Milestones) and Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security).

- (b) The Manufacturer agrees that within the first Business Hour following execution of this Agreement, the Manufacturer shall complete steps 1 to 7 of the Financial Close Protocol.
- (c) If the Purchaser provides the approvals in accordance with step 4 of the Financial Close Protocol, the Manufacturer shall complete all steps required pursuant to the Financial Close Protocol up to and including the completion of the Exchange Forward Rate Contracts.
- (d) The Purchaser agrees to comply with its obligations pursuant to the Financial Close Protocol.
- (e) Following completion of the Exchange Forward Rate Contracts, the definition of Train Capital Cost, paragraph 1.1 of Part A: (Initial Advance Payment Bond), paragraph 1.8 of Part A (Advance Payment Bond) of schedule 10 (Milestones and Security), Appendix 1 (Schedule of Milestones) to Part B: (Milestones) and Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) and Part A (Interim Milestone Payments of schedule 24 (Foreign Exchange) shall be populated by the Manufacturer Contract Manager and the Purchaser Contract Manager with the final Milestone Payments (being the Interim Milestone Payments as adjusted by the application of the Financial Close Protocol).
- (f) If the Purchaser refuses approval pursuant to step 5 of the Financial Close Protocol the process shall be suspended and the Manufacturer shall not undertake the Exchange Forward Rate Contracts. Unless the Purchaser gives notice to the Manufacturer that it wishes to exercise Option B (Hedging Rights Process) of the Financial Close Protocol with effect that TfL elects to utilise its hedging powers (in which case steps 1 to 4 of Option B of the Financial Close Protocol shall apply), the Manufacturer shall restart the Financial Close Protocol at any time requested by the Purchaser during Business Hours and the process set out in clauses 2.7(c) to 2.7(e) shall be repeated.
- (g) If:
 - (i) Option A of the Financial Close Protocol has been utilised;
 - (ii) the Purchaser terminates this Agreement in accordance with clause 36.1 prior to the Commencement Date; and
 - (iii) the Manufacturer terminates any Exchange Forward Rate Contracts relating to the Base Order which have been entered into by the Manufacturer in accordance with this clause 2.7 and the Financial Close Protocol,

then, provided that:

- (A) the costs of termination of any such Exchange Forward Rate Contracts have been calculated in accordance with clause 2.7(h);
- (B) the Manufacturer has provided to the Purchaser copies of the SWIFT confirmations referred to in clauses 2.7(h)(i) and 2.7(h)(iv);
- (C) the Manufacturer has demonstrated that such costs are reasonable and have been reasonably and properly incurred;
- (D) the Manufacturer is not in breach of this Agreement; and
- (E) the Manufacturer has taken all reasonable steps to minimise and mitigate any such costs,

such costs shall be borne by the Purchaser.

- (h) For the purposes of clause 2.7(g)(A), the costs of termination of any Exchange Forward Rate Contract(s) relating to the Base Order shall be calculated in accordance with the following process:
- (i) following the application of the Financial Close Protocol on the date of this Agreement, the Manufacturer will have received SWIFT confirmations (copies of which the Manufacture shall provide to the Purchaser) [REDACTED]
[REDACTED]
[REDACTED] for each individual Exchange Forward Rate Contract relating to the Base Order (the "**Initial Transaction(s)**");
 - (ii) if any of the Exchange Forward Rate Contract(s) relating to the Base Order are required to be cancelled pursuant to 2.7(g), the Manufacturer will either terminate such Exchange Forward Rate Contract(s) or set up reverse transactions in relation to such Exchange Forward Rate Contract(s) (a "**Counter-Deal**");
 - (iii) on the termination of any Exchange Forward Rate Contract(s) or placing of any Counter-Deal(s) (the "**Termination Transaction(s)**"), new SWIFT confirmations will be issued to the Manufacturer (copies of which the Manufacture shall provide to the Purchaser) [REDACTED]
[REDACTED] and the credit valuation adjustment) for the relevant Exchange Forward Rate Contract(s);
 - (iv) the termination cost incurred by the Manufacturer for the purposes of clause 2.7(g)(A) shall be the difference between the "Euro sell" amount for the relevant Termination Transaction and the "Euro buy" amount for the relevant Initial Transaction, as demonstrated by the SWIFT confirmations issued in relation to the Initial Transactions and the Termination Transactions (provided that such amount represents a cost to the Manufacturer and not a gain).

2.8 Information

If at any time the Manufacturer becomes aware of any matter that might prevent or delay a condition precedent in clause 2.3 from being satisfied, it shall inform the Purchaser as soon as is reasonably practicable. If at any time the Purchaser becomes aware of any matter that might prevent or delay the condition precedent set out in clause 2.4 from being satisfied it shall inform the Manufacturer as soon as is reasonably practicable.

2.9 Effect of non-satisfaction of conditions precedent

Unless all of the conditions precedent in clauses 2.3 and 2.4 are satisfied or, in the case of the conditions set out in clause 2.3 waived in writing by the Purchaser, and, in the case of the condition set out in clause 2.4 waived in writing by the Manufacturer, in each case, on or before the Scheduled Commencement Date (or such later date as the Parties may agree), this Agreement (other than the Immediately Effective Clauses) shall have no force or effect and:

- (a) the Manufacturer shall bear the costs incurred by the Purchaser and the Manufacturer in connection with the negotiation of this Agreement, where this Agreement does not have force or effect as a result of any one or more of the conditions precedent in clause 2.3 not being satisfied or waived in accordance with this clause 2.9;
- (b) each Party shall bear their own costs in connection with the negotiation of this Agreement, where this Agreement does not have force or effect as a result of the condition precedent in clause 2.4 not being satisfied or waived in accordance with this clause 2.9; and
- (c) other than as referred to in clause 2.9(a), neither Party shall have any obligation to the other under this Agreement save for any antecedent breach or under clause 38 (Confidentiality) which shall remain in full force and effect notwithstanding the non-satisfaction of the conditions precedent hereto.

3. **REPRESENTATIONS AND WARRANTIES**

3.1 The Manufacturer represents and warrants to the Purchaser as at the date of this Agreement (unless otherwise expressly stated) that:

- (a) it is a corporation, duly incorporated and validly existing under the laws of England and Wales and that it has the power to own its assets and carry on its business as it is being conducted;
- (b) the execution by it of this Agreement does not contravene any provision of:
 - (i) any existing law, treaty or regulation in force and binding on the Manufacturer;
 - (ii) the memorandum of association or articles of association of the Manufacturer;
 - (iii) any order or decree of any Court or arbitrator existing as at the date of this Agreement and binding on the Manufacturer; or
 - (iv) any obligation which is binding upon the Manufacturer or upon any of its assets or revenues;
- (c) it has the requisite power and authority to enter into, perform and deliver, and has taken all necessary action to authorise its entry into, performance and delivery of this Agreement and the transactions contemplated by this Agreement;
- (d) it has obtained all necessary shareholder and board approvals in respect of the execution of this Agreement and the performance of its obligations under it;
- (e) its obligations under this Agreement are valid, binding and enforceable at law and in equity in accordance with its terms;
- (f) no litigation, arbitration or administrative proceeding is current, pending or threatened to restrain the entry into, exercise of any of its rights under and/or performance or enforcement of or compliance with any of its obligations under this Agreement;
- (g) no meeting has been convened or is intended to be convened and/or so far as it is aware, no petition, application or the like is outstanding with a view to its winding-up;

- (h) the certified copies of the most recent statutory audited accounts, memorandum of association and articles of association of the Manufacturer delivered to the Purchaser under clause 2.3(e)(iii) are true and accurate and that no proposals are outstanding to amend those documents;
- (i) the Manufacturer (and/or the relevant Subcontractors) is/are the absolute and unencumbered proprietor of all Intellectual Property Rights necessary for the Manufacturer to carry out the Works and all other obligations under the Project Documents (other than the Corporate IPRs) described in clause 29 (Intellectual Property Rights) or, where such Intellectual Property Rights are licensed, has/have the right to exercise those Intellectual Property Rights and grant the relevant licences of those Intellectual Property Rights to the Purchaser as contemplated by this Agreement;
- (j) the entering into or performance of its obligations or exercising of its rights under this Agreement, the Project Documents or any related document will not be in breach of, or cause to be breached, any restriction (whether arising in contract or otherwise) binding on the Manufacturer or any Subcontractor or any of their respective assets or undertakings; and
- (k) in entering into this Agreement none of it, any other member of the Manufacturer Group nor, to the best of its knowledge and belief having made due enquiry, any Subcontractor of the Manufacturer has committed any Prohibited Act.

3.2 Repetition of Warranties

The Parties agree that the representations and warranties set out in clause 3.1 shall be deemed to be repeated by the Manufacturer on the Commencement Date and on each date the Manufacturer receives a Base Order Option Notice, Whole Line Option Notice or a WLO Additional Trains Option Notice in each case in accordance with this Agreement. The Manufacturer understands and acknowledges that the Purchaser is relying on these representations and warranties and is entering into this Agreement on the basis of them.

4. NOT USED

5. RELATIONSHIP WITH LUL AND REPRESENTATIVES

5.1 Acknowledgement of LUL as operator

- (a) The Manufacturer acknowledges that the Purchaser undertakes the operation of the LUL Train Services and is Infrastructure Manager of the LUL Network, except in relation to the Bakerloo Line north of Queen's Park.
- (b) The Manufacturer acknowledges that the Purchaser is entitled, by notice in writing to the Manufacturer, to:
 - (i) subcontract all or any of its obligations and functions under this Agreement to any of its Affiliates; and/or
 - (ii) appoint any Affiliate of the Purchaser to exercise all or any of the Purchaser's rights, powers and entitlements under this Agreement as agent for or nominee of the Purchaser,

in each case the "**Approved Party**", provided always that the Purchaser shall retain full responsibility (under, and subject to the terms and conditions (including limitations) of, this Agreement) for the acts and omissions of the Approved Party when carrying out any of the Purchaser's rights, powers and entitlements under this Agreement as if such acts and omissions were those of the Purchaser itself.

5.2 Notification

- (a) Without prejudice to clause 5.1(b), the Purchaser shall be entitled to notify the Manufacturer from time to time of any specific functions which the Approved Party will be carrying out on behalf of the Purchaser and, following any such notification, the Manufacturer shall co-operate with the Approved Party in the performance of such functions as if they were being carried out by the Purchaser.
- (b) The Manufacturer may rely on the authority granted under a notice served pursuant to clause 5.2(a) and such authority shall only lapse in accordance with the terms of the notice or where otherwise notified by the Purchaser.

5.3 Co-operation

- (a) The Manufacturer shall co-operate in all respects with the Approved Party as if it were the Purchaser and at the request of the Purchaser shall provide to the Approved Party any assistance reasonably required by the Approved Party to undertake any functions.
- (b) The Parties acknowledge that the Purchaser may provide any information or documents it receives in respect of or relating to this Agreement from the Manufacturer or from any third party in relation to or on behalf of the Manufacturer to the Approved Party to enable it to undertake its functions.

5.4 Representatives

In carrying out or exercising any rights, duties and obligations under this Agreement or the other Project Documents, the Purchaser shall always be entitled to consult the Approved Party and shall be entitled to bring a representative of the Approved Party to any meeting or discussion on any matter relating to this Agreement and to disclose any information and/or documents relating to the subject matter of the Project Documents to such Approved Party.

6. BASE ORDER AND OPTIONS

6.1 Base Order

The Manufacturer shall supply each item of the Base Order to the Purchaser on the relevant Contractual Acceptance Date for that item in consideration for the Purchaser paying or procuring payment to the Manufacturer of the relevant Milestone Payment of the Contract Price in respect of each item of the Base Order, in each case in accordance with the terms of this Agreement. The "**Base Order**" shall comprise:

- (a) 94 Base Order Trains;
 - (b) the Base Order Equipment; and
 - (c) the Technical Documents,
- and does not include the Whole Line Option.

6.2 Base Order Spares

- (a) The Manufacturer shall ensure that each Base Order Spare supplied:
 - (i) is a brand new part manufactured from materials of sound and satisfactory quality and is Fault Free;

- (ii) has a part number which is clearly identifiable in accordance with Good Industry Practice and conforms to the part number set out in the Bill of Materials; and
- (iii) is clearly labelled or otherwise identifiable as being the property of the Purchaser.

6.3 **Simulators**

- (a) The Manufacturer shall deliver the Train Driving Simulators (including a Train Driving Simulator Logbook relating to each Train Driving Simulator) to the Purchaser for Acceptance at such locations as the Purchaser may specify on reasonable notice (the **"Train Driving Simulator Locations"**), and in accordance with clause 8.3(e);
- (b) The Manufacturer shall:
 - (i) until the end of the Train Warranty Period, ensure that the Train Driving Simulators are always available for use at all times by the Purchaser or the Purchaser's nominee, up to date and continually represent the configuration status of the Trains in the relevant Fleet for which they are being used;
 - (ii) until the end of the Train Warranty Period:
 - (A) keep possession of the TCMS Simulator at a location in the Greater London area and ensure that the TCMS Simulator is accessible to, and always available for use at all times by, the Purchaser or the Purchaser's nominee; and
 - (B) ensure that the TCMS Simulator is:
 - (aa) fully maintained;
 - (bb) regularly cleaned; and
 - (cc) kept up to date and continually represents the configuration status of the Trains in the relevant Fleet; and
 - (iii) to the extent that the Manufacturer carries out Modifications after the end of the Train Warranty Period, update the Train Driving Simulators and TCMS Simulator to ensure they continually represent the configuration status of the Trains in the relevant Fleet.
- (c) Each Train Driving Simulator forming part of the Base Order pursuant to clause 6.1, and each Option Train Driving Simulator, shall be equipped for training with respect to operation on the Piccadilly Line and shall be capable of being configured by the Manufacturer for training with respect to operation on the Bakerloo Line, Central Line and Waterloo & City Line.
- (d) Where an option to purchase a WLO Train Driving Simulator or WLO Additional Train Driving Simulator is exercised pursuant to this Agreement, each such Train Driving Simulator shall be equipped for training with respect to operation on the relevant Whole Line Option line and shall be capable of being configured by the Manufacturer for training with respect to operation on the Piccadilly Line or any of the other lines forming part of the DTUP.
- (e) In relation to each Train Driving Simulator, in advance of the:
 - (i) introduction of the first Train into passenger service (in GoA1 operation);

- (ii) introduction of any configuration changes affecting the operation of the Trains;
- (iii) introduction of the RCS S&TC and all associated functionality (for GoA2 operation);
- (iv) introduction of configuration changes affecting the signalling system in relation to automatic train operation (GoA2);
- (v) introduction of the RCS OCS and all associated functionality; and
- (vi) conversion of the cab to the shunting operating position (GoA4),

on any of the lines forming part of the DTUP, the Manufacturer shall, following such introduction or conversion, ensure that each Train Driving Simulator has been updated to accurately reflect the systems, equipment, functionality and visual attributes of the relevant lines forming part of the DTUP.

- (f) In relation to the rectification of any operational performance issue on each Train Driving Simulator, including Faults, the Manufacturer shall:
 - (i) provide support via remote means within one hour of a notification by the Purchaser to the Manufacturer; and
 - (ii) where such issue cannot be resolved by (i) above, the Manufacturer shall provide on-site support and rectify the issue concerned within 20 hours of initial notification by the Purchaser to the Manufacturer.

6.4 **Base Order Special Tools and Base Order Non-Standard Tools**

The Manufacturer shall ensure that:

- (a) each of the Base Order Special Tools and Base Order Non-Standard Tools supplied is a brand new part manufactured from materials of sound and satisfactory quality and is Fault Free; and
- (b) each Base Order Special Tool and Base Order Non-Standard Tool has a part number which is clearly identifiable in accordance with Good Industry Practice and conforms to the part number set out in the Bill of Materials.

6.5 **Manuals**

- (a) The Manufacturer shall supply the first draft version of the Manuals to the Purchaser for Approval within 36 months after the Commencement Date and the revised version of the Manuals to the Purchaser in sufficient time for them to have received Approval no later than 12 months before Provisional Acceptance of the first Train to be Accepted, in accordance with schedule 28 (Technical Information).
- (b) The Manufacturer shall comply with the provisions set out in schedule 28 (Technical Information).

6.6 **Base Order Options**

- (a) The Manufacturer grants to the Purchaser the option to order, and if it exercises such option that the Manufacturer supplies to the Purchaser, by one or more Base Order Option Notices:
 - (i) up to a maximum of 18 Base Order Option Trains;

- (ii) Option Train Driving Simulators; and/or
- (iii) Base Order Option Cab Conversion Units,

and in each case (A) supplying a sufficient quantity of associated Base Order Option Spares to comply with the Manufacturer's obligations in clause 7.15; and (B) on the terms of this Agreement (including Part E: (Base Order Option Train Changes and WLO Additional Trains Changes) of schedule 12 (Change Procedure) and the Base Order Option Prices set out in Part C: (Base Order Options for supply of further Trains and Equipment) of schedule 10 (Milestones and Security)), and the Parties shall implement each such Base Order Option as a Base Order Option Train Change in accordance with the Change Procedure.

- (b) In addition to the option in clause 6.6(a) above, the Manufacturer grants to the Purchaser the option to order, and if it exercises such option that the Manufacturer supplies to the Purchaser, additional Base Order Option Spares, and/or Base Order Option Special Tools, by one or more Base Order Option Spares/Special Tools Notices, at the price per Base Order Spare and/or Base Order Option Special Tool, and on the terms, set out in the Bill of Materials and otherwise on the terms of this Agreement, provided that any option exercised by the Purchaser pursuant to this clause 6.6(b) shall lapse at the end of the Train Warranty Period.

Whole Line Options

6.7 The Parties acknowledge that:

- (a) the Manufacturer grants to the Purchaser the option to order, and if it exercises such option, that the Manufacturer supplies to the Purchaser:
 - (i) WLO Trains;
 - (ii) WLO Equipment; and
 - (iii) Technical Documents,

as set out in the relevant Whole Line Option Notice on the terms of schedule 25 (Whole Line Options) and the rest of this Agreement;
- (b) the Manufacturer grants to the Purchaser the option to order, and if it exercises such option, that the Manufacturer supplies to the Purchaser, by one or more WLO Additional Trains Option Notices:
 - (i) WLO Additional Trains;
 - (ii) up to a maximum of 37 Bakerloo Line Extension Trains for the Bakerloo Line Extension;
 - (iii) WLO Additional Train Driving Simulators; and/or
 - (iv) WLO Additional Cab Conversion Units;

and in each case (A) supplying a sufficient quantity of associated WLO Additional Spares to comply with the Manufacturer's obligations in clause 7.15; and (B) on the terms of this Agreement and the relevant WLO Additional Trains Option Notice (including Part E: (Base Order Option Train Changes and WLO Additional Trains Changes) of schedule 12 (Change Procedure) and the WLO Additional Trains Option Prices set out in Table 1 of paragraph 1, 2 or 3 of Appendix 4 to schedule 25 (Whole Line Options)), and the Parties shall implement each such option as a WLO Additional Trains Change in accordance with the Change Procedure; and

- (c) in addition to the option in clause 6.7(b) above, the Manufacturer grants to the Purchaser the option to order, and if it exercises such option, that the Manufacturer supplies to the Purchaser, additional WLO Additional Spares and/or WLO Additional Special Tools, by one or more WLO Additional Spares/Special Tools Notices, at the price per WLO Additional Spare and/or WLO Additional Special Tool, and on the terms set out in the Bill of Materials for the relevant Whole Line Option and otherwise on the terms of this Agreement, provided that any option exercised by the Purchaser pursuant to this clause 6.7(c) shall lapse at the end of the Train Warranty Period for the relevant Fleet ordered pursuant to the Whole Line Option.

6.8 No later than the relevant Pre-exercise Consultation Date for the exercise of the relevant Whole Line Option, the Purchaser and the Manufacturer shall consult in relation to whether the Purchaser intends to exercise the relevant Whole Line Option, unless the Purchaser has given notice to the Manufacturer before the Pre-exercise Consultation Date that the Purchaser has determined not to exercise the relevant Whole Line Option.

Whole Line Option	Pre-exercise Consultation Date	WLO Break in Production Date	Whole Line Option Notice Cut-off Date
Bakerloo Line			
Central Line			
Waterloo & City Line			

6.9 Where:

- (a) the Manufacturer has caused or contributed to a delay to the Project Programme, any Key Programme Date or is otherwise in default, or is delayed in terms of its obligations under this Agreement; and/or

(b) the Project Programme or any Key Programme Date has otherwise been extended, the Purchaser shall be entitled to extend each of the WLO Break in Production Dates and the Whole Line Option Notice Cut-off Dates, as appropriate, by an equivalent period of time as represents the delay, and shall notify the Manufacturer of such extended WLO Break in Production Date and/or Whole Line Option Notice Cut-off Date accordingly.

6.10 Prior to the relevant Pre-exercise Consultation Date, the Manufacturer shall supply to the Purchaser such information as is reasonably required by the Purchaser to assist it in the process of consultation and ultimate determination as to whether to exercise the relevant Whole Line Option including:

- (a) draft WLO Key Programme Dates and a draft WLO Project Programme for the relevant Whole Line Option which must:
- (i) incorporate and be consistent with the relevant Key Programme Dates and Project Programme for the relevant Whole Line Option set out in schedule 25 (Whole Line Options); and

- (ii) incorporate time periods for actions and milestones that are at least as good as equivalent time periods set out in the Key Programme Dates and Project Programme for the Base Order;
- (b) all 'agreed actions', 'lessons learned' and other information gained from the Base Order (and the exercise of any other Whole Line Options exercised by that date), including information relating to the design (and any design changes), supply and manufacture of Trains and Equipment, and any such information set out in the Project Progress Reports;
- (c) a draft Train Maintenance Regime for the relevant Whole Line Option;
- (d) a draft Training Programme for the relevant Whole Line Option;
- (e) a Project Execution Plan;
- (f) a Design Management Plan;
- (g) information, based on the performance monitoring that has been carried out by the Manufacturer and/or the Purchaser for the Base Order Fleet and any Fleet for any Whole Line Option that has already been exercised, to enable the Purchaser to assess whether any revisions need to be made to:
 - (i) the list and/or quantities of:
 - (A) Warranty Spares;
 - (B) Purchaser Fault Spares;
 - (C) Maintenance Spares;
 - (D) Special Tools; and/or
 - (E) Non-Standard Tools; and/or
 - (ii) the Bill of Materials,

for the relevant Whole Line Option as set out in Appendices 5, 6 or 7 (as applicable) of schedule 25 (Whole Line Options);
- (h) information to assist the Purchaser to determine whether to require the provision of additional mock-ups or a Saloon Mock-up in relation to the relevant Whole Line Option;
- (i) information to assist the Purchaser to determine whether to require the provision of additional Train Driving Simulators in relation to the relevant Whole Line Option, and/or the degree of re-configuration required of any existing Train Driving Simulators to enable operation in relation to the relevant Whole Line Option;
- (j) information to assist the Purchaser to determine whether to require the provision of updates to the information contained in the TCMS Simulator in relation to the relevant Whole Line Option;
- (k) where the Purchaser has not submitted a Purchaser Change Notice in relation to Hybrid Cooling for the Base Order pursuant to clause 10.6(c) or paragraph 5 of schedule 17 (Design Management), information to assist the Purchaser to determine the viability of incorporating Hybrid Cooling for the relevant Whole Line Option; and

- (l) any other information relating to the relevant Whole Line Option specified by the Purchaser.
- 6.11 The Manufacturer and the Purchaser shall use reasonable endeavours following such consultation to agree any further detail in respect of the relevant Whole Line Option but any failure to agree such further detail shall not prevent the Purchaser from exercising any Whole Line Option on the terms stated as at the date of this Agreement.
- 6.12 On or before the Whole Line Option Notice Cut-off Date, the Purchaser shall determine whether to exercise the relevant Whole Line Option and if the Purchaser wishes to exercise the Whole Line Option in relation to the Waterloo & City Line, such Whole Line Option shall be exercised in conjunction with either the Base Order or the Whole Line Option for the Bakerloo Line or the Whole Line Option for the Central Line (at the Purchaser's discretion).
- 6.13 If the Purchaser does not exercise the relevant Whole Line Option on or before the relevant Whole Line Option Notice Cut-off Date, it shall lapse (unless the Parties agree otherwise).
- 6.14 If the Purchaser determines to exercise any Whole Line Option it shall do so by delivery of a notice (a **"Whole Line Option Notice"**) to the Manufacturer, such notice to be on the terms set out in Part A: of schedule 21 (Pro Forma Certificates), and the date on which the Whole Line Option Notice is exercised shall be the **"Whole Line Option Notice Exercise Date"**.
- 6.15 On and from a Whole Line Option Notice Exercise Date, the terms of this Agreement shall apply to that Whole Line Option as amended or applied pursuant to schedule 25 (Whole Line Options).
- 6.16 The exercise of any Whole Line Option and the issue of a Whole Line Option Notice shall not constitute a Purchaser Change.
- 6.17 The Purchaser shall be required to make a Remobilisation Payment in relation to the exercise of a Whole Line Option only in the circumstances where the relevant Whole Line Option Notice is delivered to the Manufacturer after the relevant WLO Break in Production Date.
- 6.18 The Total Contract Price shall:
- (a) increase on and from the relevant Commencement Date in relation to any Whole Line Option, by the addition of the amount set out in the penultimate row of column (2) (labelled 'WLO Contract Price') of the table for the relevant Whole Line Option in Appendix 3 to schedule 25 (Whole Line Options) with such amounts being Indexed in accordance with paragraph 15.3 of schedule 25;
 - (b) increase on and from the relevant effective date of a Base Order Option Train Change, by the addition of the Base Order Option Price;
 - (c) increase on and from the relevant effective date of a WLO Additional Trains Change, by the addition of the WLO Additional Trains Option Price;
 - (d) be adjusted in accordance with any Change Confirmation Notice or Claim Confirmation Notice; and
 - (e) be adjusted in accordance with any payments made by the Purchaser pursuant to clause 20.10.
- 6.19 Notwithstanding any other provisions of this clause 6, the decision whether or not to exercise any Whole Line Option is in the sole and absolute discretion of the Purchaser who

may, without any obligation to the Manufacturer, choose whether or not to exercise that discretion. The Manufacturer acknowledges that the work involved in any Whole Line Option may be awarded to an alternative manufacturer or supplier. In the event that the Purchaser chooses, in its absolute discretion, not to exercise any or all of the Whole Line Options and/or awards such work to an alternative manufacturer or supplier, the Manufacturer shall have no right of action whatsoever against the Purchaser. For the avoidance of doubt the provisions of this clause apply regardless of whether or not the Purchaser elects instead to purchase additional Trains and/or Equipment for use on (i) the Bakerloo Line; (ii) the Central Line; or (iii) the Waterloo & City Line from a third party supplier.

7. MANUFACTURER'S GENERAL OBLIGATIONS

7.1 General Undertaking and Warranties

The Manufacturer undertakes and warrants to the Purchaser on each Commencement Date, for the benefit of the Purchaser and the Owner (where it is not the Purchaser), that it shall design, manufacture, supply, test, commission, and deliver each Purchased Item, the Training Services and any other item, goods or services supplied or to be supplied pursuant to this Agreement:

- (a) so that it is Fault Free;
- (b) so that, in relation to the Trains, each Train satisfies the Pre-Provisional Acceptance Criteria, the Provisional Acceptance Criteria and the Final Acceptance Criteria;
- (c) so that, in relation to the Purchased Items other than the Trains, each item satisfies the relevant Equipment Acceptance Criteria;
- (d) so that in relation to the Trains, each Train is designed and manufactured in accordance with the design agreed in accordance with this Agreement to achieve a design life of at least 40 years;
- (e) so that, in relation to each Train Driving Simulator, it is manufactured in accordance with the design agreed pursuant to this Agreement to achieve a design life of at least 20 years;
- (f) in accordance with, and so that the Trains and Equipment are in accordance with, sound modern design and engineering principles and practices in the rail industry;
- (g) in accordance with the Train Technical Requirements and the Key Programme Dates so as to achieve Acceptance of each Purchased Item, or (where permitted by this Agreement) for a Certificate of Conformance to be issued with such Purchased Item, on the Contractual Acceptance Date for that item;
- (h) in compliance with all Applicable Laws and Standards and Relevant Approvals;
- (i) in accordance with Good Industry Practice and with all due skill, care, diligence, prudence and foresight to be expected of appropriately qualified and experienced professional designers and engineers with experience in carrying out work of a similar scope, type, nature and complexity to that required under this Agreement;
- (j) in a safe manner and free from any material risk to the health and wellbeing of persons (including passengers) using, operating, maintaining, or involved in the management of the Trains or the other Purchased Items, and free so far as is reasonably practicable (taking into account the Manufacturer's obligations under this Agreement) from any risk of Environmental Damage;

- (k) using materials and goods which comply with the Train Technical Requirements and Applicable Laws and Standards such that the Trains and the Equipment will be of new manufacture and will comply with the Train Technical Requirements;
- (l) in accordance with the requirements of any Change Confirmation Notice and in all other respects in accordance with this Agreement;
- (m) in respect of the MSA Spares, so that those MSA Spares are sufficient and adequate to comply with the Manufacturer's obligations set out in clauses 7.15(a) and 7.15(b);
- (n) in respect of the Special Tools, so that those Special Tools are sufficient and adequate to enable maintenance to be carried out on the Trains in the relevant Fleet by the Purchaser in accordance with the Train Maintenance Regime so as to enable the reliability requirements of the Train Technical Requirements, including the relevant outputs of MDBSAF set out in clause 15, to be achieved;
- (o) in respect of the Non-Standard Tools, so that those Non-Standard Tools are sufficient and adequate to enable maintenance to be carried out on the Trains in the relevant Fleet by the Purchaser in accordance with the Train Maintenance Regime so as to enable the reliability requirements of the Train Technical Requirements, including the relevant outputs of MDBSAF set out in clause 15, to be achieved;
- (p) in accordance with each of the Plans; and
- (q) in accordance with and so as to enable compliance with the integration requirements set out in schedule 26 (Systems Integration), in order to ensure the integration of the Trains and Equipment into the Deep Tube Upgrade Programme,

provided always that the Manufacturer and the Purchaser acknowledge that certain Parts will require repair and/or replacement as a result of wear and tear during the 40 year design life of the Trains in accordance with the Train Maintenance Regime.

7.2 **Compliance with laws**

In performing its obligations under this Agreement, the Manufacturer shall and shall procure that its Subcontractors shall (where relevant):

- (a) comply with all Applicable Laws and Standards;
- (b) comply with their respective Safety Obligations, including all relevant requirements of the HSWA, the ROGS, the Transport and Works Act 1992 and/or any Safety Management System applicable to the testing of the Trains;
- (c) comply with all directions of the ORR, Network Rail, the Purchaser, LFEPA, HMRI and any other Competent Authority (in each case acting properly and lawfully in its role as Competent Authority), provided that the Manufacturer acknowledges and agrees that compliance with the same shall not relieve the Manufacturer from compliance with any of its obligations under this Agreement nor entitle it to any compensation or relief; and
- (d) perform their respective obligations in a manner which would be adopted by a reasonably diligent contractor acting in accordance with Good Industry Practice.

7.3 **General Assistance**

The Manufacturer shall, at its own cost:

- (a) provide in a timely manner all reasonable assistance and/or information reasonably requested from time to time by the Purchaser or its nominee in relation to any Purchased Items;
- (b) co-operate fully with any reasonable request made by the Purchaser, its nominee or Network Rail in connection with the design, construction, testing and commissioning of upgrades to the LUL Network or any part thereof;
- (c) consult with other PDPs, prepare and/or review as necessary, and in a timely manner, details of the Interfaces between the Trains and systems as more particularly set out in schedule 26 (Systems Integration);
- (d) without prejudice to clause 9 (Manufacturing Facilities and Rights of Audit), on request in writing from the Purchaser, make available to the Purchaser (without charge) all documents and data of any nature acquired or brought into existence in any manner whatsoever by or on behalf of the Manufacturer and which might reasonably be required by the Purchaser for the purposes of carrying out its duties and obligations under this Agreement and any other functions, duties or responsibilities or obligations of the Purchaser in relation to the operation of the Trains and integration of the Trains with other systems being constructed as part of the Deep Tube Upgrade Programme (and the provisions of schedule 15 (Open Book Accounting) shall apply;
- (e) during the period from the Commencement Date until the end of the Train Warranty Period, provide to the Purchaser all information relating to failures, poor performance and corrective actions relevant to the Trains, Major Components and Parts as soon as reasonably practicable after such failures, poor performance or corrective actions have occurred; and
- (f) at the request of the Purchaser, provide technical information and advice to the Purchaser with regard to the Trains and Equipment to enable the Purchaser to design, commission and procure an RCS S&TC and RCS OCS off train data analysis tool (such tool to (i) assist the maintenance staff of the Purchaser to diagnose Train defects and analyse logged events; and (ii) to enable operational staff to understand the condition of the Trains in passenger service). The Manufacturer acknowledges that the Purchaser will develop this tool as part of the Interfaces to both the RCS S&TC and the RCS OCS which may be used to replace the OTC Data Tool provided by the Manufacturer as part of the Base Order Special Tools in Part B: of schedule 8 (Spares and Special Tools).

7.4 Manufacturer as independent contractor

In entering into and performing its obligations under this Agreement, the Manufacturer shall be an independent provider and is not and shall not hold itself out as, and shall ensure that none of its employees or any Subcontractor, their subcontractors of any tier or any employee of any of them holds themselves out as, an agent of the Purchaser unless this Agreement expressly states that any such person is to act as an agent of the Purchaser.

7.5 Manufacturer costs of performance of obligations

Save as otherwise provided in this Agreement, the Manufacturer shall, in undertaking and in carrying out its obligations under this Agreement, give all notices, pay all fees, expenses, compensation, liabilities, damages and other outgoings and do all other acts or things which are or may be required to be given, paid or done whether under Applicable Laws and Standards or otherwise.

7.6 **Manufacturer to inform itself fully**

- (a) The Manufacturer shall be deemed prior to entering into this Agreement to have inspected and examined all documents and specifications and terms, and all established Applicable Laws and Standards, associated specifications and material requirements and to have obtained for itself all necessary information as to risks, contingencies and all other circumstances which may influence or affect the amounts payable to and by the Manufacturer and the performance of the obligations of the Manufacturer under this Agreement. The Manufacturer shall be responsible for the interpretation of all such information for the purposes of this Agreement.
- (b) The Manufacturer may at any time submit a reasonable request to the Purchaser for information which is not reasonably available to the Manufacturer other than from the Purchaser (a **"Request for Information"** or **"RFI"**) and, if the Purchaser is reasonably able to provide such information, the Parties shall agree a timescale for the provision of such information. For the avoidance of doubt, the Purchaser shall provide any information which it is able to procure on an unwarranted basis, unless it is information which:
 - (i) forms part of or is referenced to in the Train Technical Specification (on which the Manufacturer is entitled to rely as part of the Train Technical Specification, in carrying out its obligations to design and manufacture the Trains); or
 - (ii) the Purchaser has (in its absolute discretion) decided to provide on the basis that the Manufacturer is entitled to rely on it and is provided explicitly (and in writing) on that basis (but without prejudice to clause 8.5(b)),and under no circumstances shall a failure by the Purchaser to provide information to the Manufacturer in response to an RFI give rise to a claim by the Manufacturer for relief or compensation under this Agreement.
- (c) Save as expressly provided herein, the Manufacturer shall not be entitled to make any claim against the Purchaser or to seek any relief or remedy of any nature nor shall the Manufacturer be relieved from any risks or obligations imposed on or undertaken by it under this Agreement on the grounds:
 - (i) of any misunderstanding or misapprehension in respect of any of the matters referred to in clause 7.6(b); or
 - (ii) that incorrect or insufficient information (including the information made available to the Manufacturer at any stage) was given to it by any person whether or not in the employ of the Purchaser, other than in the case of incorrect information provided to the Manufacturer pursuant to clauses 7.6(b)(i) and 7.6(b)(ii) above; or
 - (iii) that, at the date hereof, it did not or could not foresee any matter which may affect or have affected the ability of the Manufacturer to comply with its obligations under this Agreement.

7.7 **Assurance**

The Manufacturer shall provide Progressive Assurance to the Purchaser in accordance with the requirements of schedule 6 (Assurance).

7.8 **Contract Management**

- (a) The Manufacturer shall comply with the provisions of schedule 5 (Contract Management).
- (b) The Manufacturer shall establish and maintain an office in London (the "**Project Office**") at a location to be agreed with the Purchaser for the purposes of administering its activities under this Agreement and liaising with the Purchaser's contractors.
- (c) The Manufacturer may change the location of the Project Office with the prior approval of the Purchaser and shall move the location of the Project Office if reasonably required by the Purchaser at different stages of the Works.
- (d) The Manufacturer represents and warrants to the Purchaser that the Project Programme complies with the requirements described in paragraph 5.3 (Document Management) of schedule 5 (Contract Management) and the Key Programme Dates.

7.9 **Assistance of the Purchaser**

- (a) Wherever, pursuant to any Applicable Laws and Standards or otherwise, the service of notices or documents is required by the Purchaser or its nominee (including the service of notices in respect of functions or obligations retained by the Purchaser or its nominee), and such notices or documents cannot be provided directly by the Manufacturer, the Purchaser or its nominee shall serve all such notices or documents as the Manufacturer may reasonably require to enable the Manufacturer to perform its duties and obligations under this Agreement.
- (b) Where clause 7.9(a) applies, the Manufacturer shall:
 - (i) provide the Purchaser with the requisite information in a timely manner;
 - (ii) permit the Purchaser to review the relevant information; and
 - (iii) take account of any reasonable comments of the Purchaser.
- (c) As soon as reasonably practicable following receipt, the Purchaser shall pass to the Manufacturer copies of all notices received from third parties to the extent that the subject matter of such notices relates to matters which are obligations of the Manufacturer under this Agreement including all notices relating to the subject matter of schedule 26 (Systems Integration).
- (d) Neither the Purchaser nor its nominee shall assume any responsibility for the effect or result of an application or notice which it submits to a Competent Authority or other third party on the part of the Manufacturer pursuant to this Agreement and the Manufacturer agrees that it shall retain full responsibility.

7.10 **Verification**

- (a) Without prejudice to clause 9 (Manufacturing Facilities and Rights of Audit), in order to verify the Manufacturer's performance of, and compliance with, this Agreement, the Purchaser (and/or its nominees) shall be entitled to inspect or witness any aspect of the design, manufacture, supply, testing, commissioning and delivery of the Trains and the Equipment, their components or allied services, and to inspect the Technical Documents and to audit the management systems of the Manufacturer and those of any Subcontractor. The Purchaser (and/or any nominees) shall be entitled to enter on to the premises of the Manufacturer and any Subcontractor for this purpose, provided that no such inspection or audit shall unreasonably disrupt the commercial and industrial operation of the Manufacturer

or any Subcontractor. Clause 9.8 shall apply in respect of any action found to be required as a consequence of such inspection or audit.

- (b) The Parties shall bear their own inspection and witnessing costs pursuant to this clause 7.10.

7.11 **Designated Depots**

- (a) The Purchaser shall procure the completion of the Purchaser Depot Works at the Designated Depots relating to the Base Order by the relevant dates set out in the Key Programme Dates and, following the exercise of any Whole Line Option, at the Designated Depots relating to the relevant Whole Line Option, in accordance with schedule 25 (Whole Line Options).
- (b) Subject to clause 7.11(a), the Manufacturer warrants, and warrants that it has carried out sufficient depot modelling to demonstrate, that the design of the Designated Depots means the Designated Depots (including, as the case may be, those relating to Whole Line Options) are, or will be, adequate and sufficient to enable the Purchaser to maintain the Trains in the relevant Fleet at the relevant Designated Depots in accordance with the relevant Train Maintenance Regime.
- (c) If the Manufacturer is in breach of the warranty in clause 7.11(b), then (without prejudice to the Purchaser's rights and remedies in respect of such breach) any further works (the **"Manufacturer Depot Warranty Works"**) required to remedy such breach and to ensure that the warranty in clause 7.11(b) is satisfied shall be undertaken by the Purchaser or (at the Purchaser's discretion) by a third party, in either case at the cost and risk of the Manufacturer.
- (d) The Manufacturer shall not be entitled to make any claim against the Purchaser in respect of, nor be relieved from any obligations as a result of, any further Manufacturer Depot Warranty Works carried out or to be carried out pursuant to clause 7.11(c).
- (e) If the Purchaser has not procured the completion of the Purchaser Depot Works by the date set out in the relevant Key Programme Dates, the Purchaser shall not be obliged to Accept any Trains pursuant to clause 15.6 in its absolute discretion, without prejudice to the application of Compensation Event (h).
- (f) The Purchaser shall not be obliged to Accept any Trains pursuant to clause 15.6 until all Manufacturer Depot Warranty Works required to be carried out pursuant to clause 7.11(c) have been completed to the Purchaser's reasonable satisfaction.
- (g) The Manufacturer shall not carry out, or procure the carrying out of, any depot works at the Designated Depots, except with the prior written consent of the Purchaser to be given in the Purchaser's absolute discretion, and which consent will not be given until the Purchaser is satisfied with all aspects of the depot works (including the insurance arrangements).
- (h) From Pre-Provisional Acceptance of the first Train in the relevant Fleet until the end of the Train Warranty Period, the Manufacturer shall ensure that at all times a sufficient number of its suitably qualified employees or representatives, or employees or representatives of a Subcontractor, are located at the relevant Designated Depot including for the purposes of:
 - (i) carrying out:
 - (A) the rectification of any Fault (where such rectification is required by this Agreement to be carried out by the Manufacturer);

- (B) the Manufacturer's other warranty obligations under clause 20;
 - (ii) advising and assisting the Purchaser in relation to maintenance activities as set out in the Train Maintenance Regime and Fault rectification, in each case as to be carried out by the Purchaser or as may be requested from time to time by the Purchaser;
 - (iii) in addition to clauses 7.11(h)(i) and 7.11(h)(ii) above, analysing any Fault in a Train, Part or item of Equipment as required by clause 20;
 - (iv) carrying out the Manufacturer's performance monitoring, technical advice and spares management obligations as set out in paragraphs 13 to 15 of schedule 5 (Contract Management); and
 - (v) monitoring the consumption and stocks of Spares and Consumables during the Train Warranty Period.
- (i) The Manufacturer undertakes that while any of its employees or representatives are located at a Designated Depot, any other of the Purchaser's premises or on the LUL Network, such employees or representatives shall:
- (i) comply with (A) any Designated Depot rules and/or policies in existence from time to time; and (B) the Purchaser's health and safety rules and documentation including, but not limited to, the documents listed in schedule 16 (Health, Safety and Environment) and any specific Designated Depot health and safety rules and/or policies in existence from time to time; and
 - (ii) not disrupt the commercial and industrial operation of the Purchaser or its subcontractors,

and the Manufacturer shall procure that any employees or representatives of any Subcontractors comply with the same.

7.12 **Enhanced Capital Allowances**

- (a) To enable the Purchaser to support TfL's claim to Her Majesty's Revenue & Customs ("**HMRC**") in relation to Enhanced Capital Allowances, the Manufacturer shall have any eligible components listed in the Energy Technology List or the Water Technology list and shall provide the following information to the Purchaser as necessary:
- (i) details of eligible components, including:
 - (A) the number of components;
 - (B) unique model reference numbers; and
 - (C) manufacturer details and evidence of conformance with minimum performance;
 - (ii) the cost per each eligible component;
 - (iii) any applicable professional fees directly associated with the provision of each eligible component;
 - (iv) the installation and delivery cost of each eligible component and associated preliminaries directly associated with the provision of each eligible component; and

- (v) details of the Train that each eligible component purchased will be installed on,

and, for the purposes of this clause 7.12, "**eligible components**" shall mean any of those components listed, or capable of being listed, in the Energy Technology List or the Water Technology List.

- (b) For each cost incurred in relation to clauses 7.12(a)(ii) to (iv), an invoice or payment certificate shall be provided with supporting evidence that confirms the cost incurred at clauses 7.12(a)(ii) to (iv) has sufficient nexus to each eligible component (where applicable). In addition, the delivery date for each eligible component at clauses 7.12(a)(ii) to (iv) shall be provided.
- (c) The Manufacturer agrees to co-operate with the Purchaser and TfL and its professional advisers in relation to the submission and agreement of such claim to HMRC.

7.13 Compliance with Applicable Standards

- (a) If there is an inconsistency between a standard referred to in paragraph (b) of the definition of Applicable Standards and any other aspect/requirement/remainder of the Train Technical Specification, the terms of the Train Technical Specification shall take priority.
- (b) If there is an inconsistency between any two or more Applicable Standards, the following order of priority shall apply such that the Manufacturer should not have to comply with any element of a lower ranking Applicable Standard if and to the extent that a higher ranking Applicable Standard conflicts with it:
 - (i) first: Specified Standards;
 - (ii) second: British Standards;
 - (iii) third: European Standards; and
 - (iv) fourth: International Standards and associated codes of practice.

7.14 Obtaining Parts from third party suppliers

Without prejudice to the Manufacturer's other obligations under this Agreement and the Project Documents, the Manufacturer undertakes to ensure that the Train and Equipment Design maximises the ability of the Purchaser to source spares, consumables and parts for the Trains from third party suppliers following the end of the Train Warranty Period and undertakes to provide the Purchaser with all relevant documentation to enable the Purchaser to do this.

7.15 Provision and replenishment of Base Order Spares during the Train Warranty Period

- (a) Without prejudice to clause 7.15(f), for the duration of the Train Warranty Period, the Manufacturer shall be responsible for supplying at the Designated Depot, or any other location notified by the Purchaser, sufficient:
 - (i) Base Order Warranty Spares to enable the Manufacturer (without prejudice to the Purchaser's right in clause 20.3(b) to rectify or procure the rectification of a Manufacturer Fault and require the Manufacturer to indemnify the Purchaser) to:

- (A) rectify all Manufacturer Faults on the relevant Fleet and Equipment;
and
- (B) carry out all other warranty work required by this Agreement on the relevant Fleet and Equipment; and
- (ii) Base Order Maintenance Spares to enable the Purchaser to carry out all routine maintenance on the relevant Fleet and Equipment,

and, for the avoidance of doubt, the Total Contract Price shall not be amended and no further payment shall be made to the Manufacturer if the quantity of Base Order Warranty Spares and/or Base Order Maintenance Spares required pursuant to this clause 7.15(a) differs from any prediction made by the Manufacturer or anything set out in Part A: of schedule 8 (Spares and Special Tools), in accordance with the Manufacturer's replenishment obligations in clause 7.15(c) below.

- (b) For the duration of the Train Warranty Period, the Manufacturer shall be responsible for supplying at the Designated Depot, or any other location notified by the Purchaser, the number of Base Order Purchaser Fault Spares set out in Part A: of schedule 8 (Spares and Special Tools) to enable the Purchaser, or (where applicable) the Manufacturer, to rectify Purchaser Faults on the Trains and Equipment.
- (c) Where a Base Order Spare has been used during the Train Warranty Period to carry out any of the activities described in clause 7.15(a) or 7.15(b) above, the Manufacturer shall ensure that:
 - (i) where a Base Order Warranty Spare or Base Order Maintenance Spare has been used, such Base Order Warranty Spare or Base Order Maintenance Spare is replenished or, where appropriate, Reconditioned as soon as reasonably practicable after it has been used and in any case to ensure compliance with clause 7.15(e); and
 - (ii) subject to clause 7.15(d) below, where a Base Order Purchaser Fault Spare has been used, such Base Order Purchaser Fault Spare is replenished or, where appropriate, Reconditioned as soon as reasonably practicable after it has been used and in any case to ensure compliance with clause 7.15(e).
- (d) Where a Base Order Purchaser Fault Spare has been used to rectify a Purchaser Fault pursuant to clause 7.15(b), the Purchaser shall, at its absolute discretion, either:
 - (i) reimburse the Manufacturer for the cost of replenishing or, where appropriate, Reconditioning the Base Order Purchaser Fault Spare pursuant to clause 7.15(c)(ii) at the price set out in the Bill of Materials; or
 - (ii) direct the Manufacturer not to replenish or Recondition that Base Order Purchaser Fault Spare, in which case clause 7.15(c)(ii) shall not apply.
- (e) For the duration of the Train Warranty Period, the Manufacturer shall, on a monthly basis, ensure that the Base Order Spares are replenished or, where appropriate, Reconditioned at a sufficient rate and in sufficient quantities to enable the Parties to carry out all of the activities described in clauses 7.15(a) and 7.15(b) for the next 12 month period (provided that the Manufacturer shall not deliver to the Purchaser any Base Order Spare if it is not due to be used for such activities within that next 12 month period) pursuant to the requirements of Train Maintenance Regime and on the basis set out in the Bill of Materials.

- (f) In accordance with clause 7.15(e), on or before the date which is six (6) months prior to each Planned FSA Services Commencement Date, the Manufacturer shall supply or have supplied to the Purchaser a sufficient quantity of Base Order Spares to enable the Purchaser to carry out all of the activities described in clauses 7.15(a) and 7.15(b) for the 12 month period following the end of the Train Warranty Period pursuant to the requirements of the Train Maintenance Regime and as set out in the Bill of Materials.
- (g) Unless the Manufacturer has already satisfied the obligations in paragraphs (i) and (ii) below, the Train Warranty Period for the relevant Fleet shall be extended until the later of the date on which:
 - (i) the Manufacturer has procured that the Service Provider has put in place the FSA Insurances pursuant to clause 2.9(a) of the FSA; and
 - (ii) the number of Base Order Spares required by the Train Maintenance Regime and set out in the Bill of Materials have been provided by the Manufacturer pursuant to clause 7.15(f) and are in the Purchaser's possession to enable the Purchaser to carry out all relevant activities for the 12 month period immediately following the end of the Train Warranty Period.
- (h) Without prejudice to clause 7.15(g), if the Manufacturer is in breach of any of the obligations in this clause 7.15, the Purchaser shall be entitled to serve a non-compliance notice on the Manufacturer, and the Manufacturer shall be required to provide adequate Base Order Spares to fulfil the requirements of this clause 7.15 in accordance with what is set out in the non-compliance notice.
- (i) Where the Purchaser orders Base Order Option Trains pursuant to clause 6.6, the Manufacturer's obligation to provide all Base Order Warranty Spares and Base Order Maintenance Spares until the end of the Train Warranty Period pursuant to clause 7.15(a), and the Manufacturer's obligation to provide all Base Order Purchaser Fault Spares in accordance with the Train Maintenance Regime, shall apply to those Base Order Option Trains as if they were Base Order Trains.
- (j) Amounts payable by the Purchaser under clause 7.15(d) shall be invoiced by the Manufacturer on the last Working Day of each TfL Period and paid by the Purchaser at the end of the TfL Period following the TfL Period in which the invoice is received, and the Total Contract Price shall increase by the actual amount paid in each case.

7.16 OTC - Infrastructure-Borne Equipment and Automatic Lineside Inspection Equipment

- (a) Following supply by the Manufacturer of the OTC - Infrastructure-Borne Equipment by the date agreed between the Parties during the Train and Equipment Design:
 - (i) the Purchaser shall, pursuant to Section 15.10.4 of the Train Technical Specification, install, or procure the installation of, the OTC - Infrastructure-Borne Equipment on platforms on stations on the LUL Network, at the relevant Designated Depots and at other relevant locations on the LUL Network:
 - (A) in accordance with any reasonable installation instructions provided by the Manufacturer to the Purchaser; and
 - (B) by the date agreed between the Parties during the Train and Equipment Design; and

- (ii) for each location on the LUL Network where installation has taken place, the Manufacturer shall verify to the Purchaser that the OTC – Infrastructure-Borne Equipment has been installed in accordance with clause 7.16(a)(i)(A) above.
- (b) Following supply by the Manufacturer of the Automatic Lineside Inspection Equipment by the date agreed between the Parties during the Train and Equipment Design:
 - (i) the Purchaser shall, pursuant to Section 21.1 of the Train Technical Specification, install, or procure the installation of, the Automatic Lineside Inspection Equipment at the relevant Designated Depot:
 - (A) in accordance with any reasonable installation instructions provided by the Manufacturer to the Purchaser; and
 - (B) by the date that the Automatic Lineside Inspection Equipment is required to be ready for use as set out in the relevant Key Programme Dates; and
 - (ii) for each Designated Depot where installation has taken place, the Manufacturer shall verify to the Purchaser that the Automatic Lineside Inspection Equipment has been installed in accordance with clause 7.16(b)(i)(A) above.

7.17 LUL Operating Conditions

- (a) Throughout the life of this Agreement, the Manufacturer shall use all reasonable endeavours to make itself aware of the LUL Operating Conditions in respect of each Fleet.
- (b) On and from Acceptance of the first Train to be Accepted, the Manufacturer shall give notice to the Purchaser in respect of each Fleet as soon as reasonably practicable of any LUL Operating Conditions where such LUL Operating Conditions are materially different from those set out in this Agreement (including the Train Technical Specification) and/or the Train Maintenance Regime. Any such notification shall be deemed to be a notification for the purposes of this clause 7.17 and clause 5.14 of the FSA.
- (c) Where:
 - (i) the Manufacturer informs the Purchaser of an LUL Operating Condition pursuant to clause 7.17(b) above; and/or
 - (ii) the Purchaser informs the Manufacturer of an LUL Operating Condition which the Manufacturer should have been aware of as a prudent manufacturer or maintainer of rolling stock,

the Manufacturer shall co-operate with the Purchaser to mitigate the impact of any such LUL Operating Condition on the Project, any Train, item of Equipment or Major Component, and on the Purchaser.

7.18 ACS/Overhaul Services

- (a) Where any ACS Date falls before the expiry of the relevant Train Warranty Period, the Manufacturer shall perform the relevant ACS Services in respect of the relevant type of ACS/Overhaul Component in accordance with the provisions set out in paragraph 8 of part B of Schedule 1 (The Services) of the FSA (as if the

Manufacturer were the Service Provider, and the Purchaser were acting in its capacity as Customer, and making any further necessary changes).

- (b) The Purchaser may, in respect of a Fleet, at any time prior to the end of the Train Warranty Period for that Fleet, exercise any Component Overhaul Option in accordance with the provisions set out in paragraph 9 of part B of Schedule 1 (The Services) of the FSA (as if the Purchaser were acting in its capacity as Customer, and as if the Manufacturer were the Service Provider, and making any further necessary changes).
- (c) Where the Purchaser exercises any Component Overhaul Option as referred to in clause 7.18(b) above, the Purchaser shall pay to the Manufacturer an amount equal to the amount that the Customer would have paid to the Service Provider under the FSA, in accordance with paragraph 5 and Appendix 7 of schedule 11 of the FSA, on exercise of the Component Overhaul Option under the FSA.
- (d) Where the Manufacturer demonstrates that the costs of performing a Component Overhaul (as defined in the FSA) are in excess of the amount payable by the Purchaser pursuant to clause 7.18(c) above as a direct result of any Purchaser Fault, any such additional costs shall be met by the Purchaser.
- (e) Any work or overhauls carried out pursuant to this clause 7.18 shall be without prejudice to any warranty work required to be carried out by the Manufacturer under this Agreement, with the effect that any work that should have been paid for by the Purchaser under the provisions relating to warranty work will not be paid for under the provisions relating to ACS Services in this clause 7.18.

8. DOCUMENTATION

8.1 Priority of contract documents

- (a) Unless expressly stated otherwise (including as stated in clause 8.1(b)), where there is a conflict or other discrepancy between the Train Technical Specification and the Manufacturer Train Proposal, the Train Technical Specification shall prevail.
- (b) Where such a conflict or discrepancy exists and the Manufacturer Train Proposal offers a more beneficial position to the Purchaser than that set out in the Train Technical Specification, unless the Purchaser in its absolute discretion decides otherwise, the Manufacturer shall, in such a respect only, comply with the Manufacturer Train Proposal.

8.2 Priority of provisions in this Agreement

Unless expressly stated otherwise, where there is a conflict or other discrepancy between a clause of this Agreement and the provisions of a schedule, the provisions of the clause of this Agreement shall prevail.

8.3 Key Programme Dates

- (a) The Manufacturer undertakes to carry out the design, manufacture, testing, validation, systems integration and supply of the Trains and the other Purchased Items in accordance with the Key Programme Dates.
- (b) Unless expressly stated otherwise, the Key Programme Dates shall not be amended in any manner or form without the Purchaser or its nominee granting Approval to such amendment. Any changes to the Key Programme Dates that are requested by the Manufacturer or, following Approval by the Purchaser, made by the Manufacturer, must comply with paragraph 6.4 of schedule 5 (Contract Management).

- (c) The matters set out in the Key Programme Dates shall be wholly without prejudice to the Manufacturer's obligation to achieve Acceptance for each Train and each other Purchased Item, or (where permitted by this Agreement) for a Certificate of Conformance to be issued with such other Purchased Item, on the Contractual Acceptance Date for that Train or Purchased Item.
- (d) The Manufacturer undertakes that it will deliver all relevant contract documents in accordance with the dates set out in the Key Programme Dates.
- (e) Without prejudice to any Manufacturer obligations to provide documents relating to the Train Driving Simulators that are required to be delivered earlier, the Manufacturer undertakes that each Train Driving Simulator will achieve Equipment Acceptance and be installed and fully functioning at the relevant Train Driving Simulator Location in accordance with the relevant Key Programme Dates not less than 12 months before the Contractual Acceptance Date of the first Train as set out in the relevant Key Programme Dates.

8.4 **Manufacturer's acknowledgements regarding discrepancies and errors**

- (a) The Manufacturer confirms to the Purchaser that, as at the Commencement Date, it has reviewed and considered in detail this Agreement and has satisfied itself:
 - (i) that no discrepancies or errors exist within this Agreement, save for discrepancies and errors which would not be identifiable or foreseeable by an experienced rolling stock manufacturer;
 - (ii) as to the feasibility of the Train Technical Specification with respect to the design, manufacture, testing, commissioning and supply of the Trains, but without prejudice to clause 7.6, save for information and circumstances relating to the Infrastructure of the LUL Network to the extent that such are not included into this Agreement (including its schedules);
 - (iii) without prejudice to clause 7.6(b), that it has all information with regard to the LUL Network available at the date of this Agreement to enable the Manufacturer to carry out the Works and to achieve Acceptance of each Train based on schedule 1 (Train Technical Specification) and that, to the extent that any additional infrastructure parameter information ("**Additional Infrastructure Information**") is required, the Manufacturer shall request this from the relevant Infrastructure Manager and shall not be entitled to make any claim against the Purchaser or seek any relief or remedy or to be relieved from its obligations on the grounds of the obtaining by the Manufacturer of such Additional Infrastructure Information from that Infrastructure Manager;
 - (iv) that the Manufacturer Train Proposal conforms with and will implement in every respect the Train Technical Specification; and
 - (v) that the Manufacturer will be able to implement the Train Technical Requirements within the timescales set out in the Key Programme Dates.
- (b) The Manufacturer acknowledges that, save as provided in clause 8.6(c), it accepts all risks arising from any discrepancies or errors that subsequently appear within this Agreement or between any provisions and/or schedules of this Agreement and that, subject as aforesaid, it shall not be entitled to make any claim against the Purchaser for extension of time, payment or otherwise in respect of any such errors or discrepancies.

8.5 Infrastructure

- (a) The Manufacturer confirms that it has verified that as at the date of this Agreement (and as at the relevant Commencement Date for each Whole Line Option) all information in its possession (or in the possession of any member of the Manufacturer Group) relating to the LUL Network is consistent with the Train Technical Specification and that no discrepancies exist between the two or, if any such discrepancies do exist, that it has notified the Purchaser of any such discrepancies which may exist.
- (b) On and from the Commencement Date relating to the Base Order, the Manufacturer shall verify that all information and data relating to the LUL Network (or part thereof) that it receives from or on behalf of the Purchaser or Network Rail (or otherwise) is consistent with the Train Technical Specification and with all Applicable Laws and Standards and shall inform the Purchaser of any discrepancies or inconsistency as soon as reasonably practicable after receipt of such LUL Network related information and (without prejudice to the fact that all such information is obtained at the Manufacturer's risk) shall co-operate with the Purchaser to mitigate the impact of any such discrepancies on this Project.
- (c) If the Manufacturer requests Additional Infrastructure Information, the Purchaser shall, in its capacity as operator/future operator of the Trains, endeavour to provide such Additional Infrastructure Information to the Manufacturer, or shall endeavour to procure such Additional Infrastructure Information from Network Rail, as the case may be, and clause 8.4(a)(iii) shall apply.

8.6 Notification and resolution of any discrepancies or errors

The Manufacturer shall notify the Purchaser forthwith upon becoming aware of a discrepancy or error within this Agreement that cannot be resolved in accordance with clauses 8.1 and 8.2. The Manufacturer agrees with the Purchaser that:

- (a) subject to clause 8.1(b) where there appears a discrepancy between the Train Technical Specification and the Manufacturer Train Proposal, the Train Technical Specification shall prevail;
- (b) subject as provided in paragraph (a), where there appears a discrepancy within the Train Technical Requirements (including a conflict between any Applicable Laws and Standards and another element of the Train Technical Specification) which cannot be resolved by the Train Technical Specification, the Manufacturer shall provide with the notice of such discrepancy an explanation of how the discrepancy can be so resolved. Within 15 Working Days of the Manufacturer's notice, the Purchaser shall consult with the Manufacturer to resolve the discrepancy and may, in accordance with paragraph (c), notify the Manufacturer to resolve the discrepancy in a different manner. Unless the Purchaser notifies the Manufacturer to resolve the discrepancy in a different manner, the Manufacturer shall resolve the discrepancy in the manner proposed by it (subject always to that means of resolving the discrepancy being in compliance with Applicable Laws and Standards);
- (c) subject as provided in paragraphs (a) and (b):
 - (i) where there is a discrepancy or error within the Train Technical Specification, the Purchaser shall decide how such discrepancy or error should be dealt with, and shall notify the Manufacturer of such decision within 15 Working Days of the Manufacturer's notice of such discrepancy or error. The Manufacturer shall comply with such decision in carrying out the manufacture of the Trains. The Manufacturer acknowledges that no

omission of information in the Train Technical Specification or requirement for Additional Infrastructure Information shall constitute an error for the purposes of this clause 8.6. In the case of an error in the Train Technical Specification which does not constitute a discrepancy, the Purchaser's notification under this clause 8.6 shall constitute a Purchaser Change Notice and the provisions of Part B: (Purchaser Changes) of schedule 12 (Change Procedure) shall apply (and the Purchaser agrees not to withdraw such Purchaser Change to the extent that the terms of this sub-paragraph (i) apply); and

- (ii) where there is a discrepancy or error within the Manufacturer Train Proposal and/or the Project Programme, the Manufacturer shall at its own cost resolve such discrepancy or error in accordance with the provisions of Part C: (Manufacturer Changes) of schedule 12 (Change Procedure).
- (d) Without prejudice to paragraphs (a) to (c), whenever a discrepancy or error appears within this Agreement, the Parties shall consult with each other and endeavour to agree the manner in which the error or discrepancy should be resolved.

8.7 Plans

- (a) The Manufacturer shall comply with each of the Plans as may be amended from time to time in accordance with clause 8.7(b).
- (b) Unless expressly stated otherwise the Manufacturer shall not be entitled to amend any Plan in any manner or form without obtaining the prior Approval of the Purchaser or its nominee to such amendments.

8.8 No Extension of Time

The Manufacturer acknowledges and agrees that compliance with its obligations in the Assurance Regime shall not entitle it to:

- (a) any extension of time to the Contractual Acceptance Date in respect of any Purchased Item or otherwise entitle the Manufacturer to any adjustment to the Key Programme Dates or the Project Programme;
- (b) any adjustment to:
 - (i) the Contract Price for any Purchased Item;
 - (ii) the Base Order Option Price for any Base Order Option;
 - (iii) the Total Contract Price and/or the Schedule of Milestones; or
- (c) be reimbursed for any costs and expenses incurred or otherwise be compensated in any form or manner.

8.9 Technical Library

The Manufacturer shall:

- (a) establish the Technical Library in electronic format from the relevant Commencement Date;
- (b) progressively populate the Technical Library with Technical Documents as soon as they are created and updated (and ensure such Technical Documents are produced in accordance with paragraph 5.2 of schedule 5 (Contract Management));

- (c) comply with all of the provisions of paragraph 14.4 of schedule 5 (Contract Management); and
- (d) in addition to the maintenance of the Technical Library, integrate and maintain up-to-date Technical Documents in the LUL Database in a form which is easily searchable, readable and capable of being edited by the Purchaser.

9. **MANUFACTURING FACILITIES AND RIGHTS OF AUDIT**

9.1 **Manufacturing Facilities**

The Manufacturer shall ensure that the Primary Assembly and Manufacture of the Trains shall be carried out by the Manufacturer at the Manufacturer's Premises and the Manufacturer shall not use any other manufacturing facility for the Primary Assembly and Manufacture of the Trains without the prior agreement of the Purchaser.

9.2 **Access to Facilities**

The Manufacturer shall without further charge grant access to the Purchaser and, at the request of the Purchaser, any PDPs during normal business hours and on reasonable prior notice, to any premises used by the Manufacturer or any of its Subcontractors in performing its obligations pursuant to this Agreement for the purposes of audit, verification, inspection and integration, to the extent necessary to allow the Purchaser to exercise any of its rights granted under this Agreement.

9.3 **Right of Audit**

- (a) The Manufacturer shall, and shall procure that its Subcontractors shall:
 - (i) maintain a complete and correct set of records pertaining to all activities relating to the performance of the Manufacturer's obligations under this Agreement and all transactions and Subcontracts entered into by the Manufacturer for the purposes of performing its obligations under this Agreement (in respect of the Manufacturer) and the performance by the Key Subcontractor of its obligations under its Key Subcontract (in respect of the Key Subcontractor) (the "**Manufacturer's Records**"); and
 - (ii) to the extent not handed over to the Purchaser on termination or expiry of this Agreement, retain all the Manufacturer's Records during the life of this Agreement and for a period of not less than 12 years (or such longer period as may be required by law) following termination or expiry of this Agreement (the "**Retention Period**").
- (b) Notwithstanding any other right of audit to which the Purchaser is entitled under this Agreement or under any Applicable Laws and Standards, in order to verify the Manufacturer's performance of and compliance with this Agreement the Purchaser (and/or its nominees) shall be entitled on reasonable written notice, to:
 - (i) audit, inspect or witness any aspects of the design, manufacturing, testing or commissioning of the Trains or any other Purchased Items or any of their Parts and to audit the design and certification thereof including being present at, taking photographs, making audio or visual recordings of, and participating in, amongst other things:
 - (A) any inspection and conformance control of Subsystems supplied by Key Subcontractors;
 - (B) any inspection and conformance control of a Train construction at stages to be agreed between the Purchaser and the Manufacturer;

- (C) any system tests (at stages to be agreed) during construction;
 - (D) any dynamic run testing of completed Trains;
 - (E) any systems integration testing; and
 - (F) any inspection and certification of each Train's compliance with the Train Technical Requirements, Assurance Regime and Manufacturer Train Proposal after completion of assembly and dynamic testing;
- (ii) inspect the sub assembly of each Train;
 - (iii) inspect and be provided with copies (electronic and hard copy) without further charge to the extent necessary to verify the Manufacturer's compliance with this Agreement any and all of the Manufacturer's Records during the Retention Period (excluding any commercially confidential information to which the Purchaser is not otherwise entitled pursuant to this Agreement);
 - (iv) audit the management systems of the Manufacturer and those of any Subcontractor; and
 - (v) inspect and/or audit compliance by the Manufacturer and its Key Subcontractors with the Manufacturer's obligations under this Agreement,

provided that each of the audits and inspections described in paragraphs (i) to (v) shall not unreasonably disrupt the commercial and industrial operation of the Manufacturer or its Subcontractors.

9.4 **Co-operation with Audit Procedure**

To the extent necessary for the purpose of exercising any of the rights granted under clause 9.3, the Manufacturer shall provide, and shall procure that its Subcontractors shall provide, all reasonable co-operation to the Purchaser and/or its nominee including:

- (a) ensuring that appropriate safety and security systems are in place to prevent unauthorised access, extraction of and/or alteration to any of the Manufacturer's Records;
- (b) subject to clause 9.3(b)(iii), making all of the Manufacturer's Records available for inspection and within a reasonable time (or within such reasonable time specified by the Purchaser if such a time is specified) if requested; and
- (c) making the Manufacturer's employees and/or any Subcontractor's employees available for discussion with the Purchaser or its nominee.

9.5 **Purchaser's Resident Representatives**

The Manufacturer shall:

- (a) procure that the Purchaser shall be entitled to locate ten suitably qualified Purchaser representatives (the "**Purchaser's Resident Representatives**") and 20 suitably qualified representatives representing all of the PDPs ("**PDP Representatives**"), at the Manufacturer's Premises and at any Subcontractor's works at any time from the Commencement Date until Final Acceptance of the last Train; and
- (b) be responsible for providing the Purchaser's Resident Representatives with:

- (i) suitable comfortable office accommodation and meeting room facilities for 10 people at the Manufacturer's Premises and 10 people at the Test Track Facilities consisting of:
 - (A) desks;
 - (B) chairs;
 - (C) pedestal drawers;
 - (D) photocopiers;
 - (E) document scanners;
 - (F) high-speed secure Wi-Fi access; and
 - (G) telephone handsets with power sockets and two phone lines (each with broadband capability);
- (ii) facilities as are reasonably required by the Purchaser to be located at any Subcontractor's works; and
- (iii) any necessary or desirable training required by the Purchaser's Resident Representatives in order to access or assist in the access to the Manufacturer's or any Subcontractor works or facilities.

9.6 The Manufacturer acknowledges and agrees that the Purchaser's Resident Representatives situated at the Manufacturer's Premises, Test Track Facilities and/or Subcontractor's works may exercise any of the rights of audit granted to the Purchaser under this clause 9 and the Manufacturer shall provide the Purchaser's Resident Representatives with unrestricted access to any documentation and records relating to the performance of the Works.

9.7 **No Claim for Relief**

No audit, inspection and/or testing by the Purchaser, the Purchaser's nominee, a Purchaser's Resident Representative or a PDP Representative pursuant to this clause 9 shall relieve the Manufacturer (nor any of its Subcontractors) from any of its obligations under this Agreement or prejudice any right, power and/or remedy of the Purchaser against the Manufacturer.

9.8 **Corrective Actions Arising**

- (a) If and to the extent that the Purchaser, the Purchaser's nominee or a Purchaser Contract Manager, when exercising their respective rights under this clause 9, clause 7.10 or otherwise, discovers any potential or actual breach or non-compliance with the Manufacturer's obligations under this Agreement then the Manufacturer shall carry out any actions found to be reasonably necessary to remedy such potential or actual breach or non-compliance (each, a "**Corrective Action**") as soon as reasonably practicable in accordance with the following provisions of this clause 9.8.
- (b) The Manufacturer shall acknowledge formally within two (2) Working Days receipt of any request for a Corrective Action raised by the Purchaser, its nominee or a Purchaser Contract Manager, together with the Manufacturer's confirmation of the timescale allocated by the Purchaser, its nominee or a Purchaser Contract Manager for the Manufacturer to close out the Corrective Action. The Manufacturer shall advise the Purchaser and/or its nominee upon its close-out of the Corrective Action, together with details of the Corrective Action applied. The Purchaser shall be

entitled to undertake a further audit of any Corrective Actions on the same basis as set out in clauses 9.2 to 9.6.

- (c) If the Manufacturer (acting reasonably) disputes any Corrective Action it shall notify the Purchaser whereupon the Manufacturer and the Purchaser shall consult with each other and seek to resolve such dispute and in default of such resolution either the Purchaser or the Manufacturer may refer the dispute for determination in accordance with clause 40 (Dispute Resolution).

10. DESIGN AND MOCK-UPS

10.1 Design Specification and Assurance Regime

The Manufacturer:

- (a) shall undertake the design of the Trains and Equipment in accordance with the requirements of this Agreement including the Train Technical Specification, schedule 17 (Design Management) and the Project Programme;
- (b) shall provide to the Purchaser throughout the Assurance Period, Progressive Assurance in accordance with the Assurance Regime that the Train Technical Requirements have been understood by the Manufacturer and that the Manufacturer's design proposals for the Trains and Equipment satisfy the Train Technical Specification and will be at all times capable of meeting the Manufacturer's obligations under this Agreement; and
- (c) acknowledges that, for the period up to Final Design Submission, there will be up to two PDPs for the Interface(s) relating to Train-Borne Signalling and that references in this Agreement to the PDP in respect of the Train-Borne Signalling Interface(s) shall be construed as and include references to up to two PDPs in respect of the Train-Borne Signalling Interface(s).

10.2 Design Authority

- (a) The Manufacturer acknowledges that it is and shall act as the Design Authority in respect of the Trains and Equipment in accordance with all Applicable Laws and Standards (unless otherwise agreed with the Purchaser) in relation to each relevant Fleet.
- (b) If a Party becomes aware of a substandard condition in a critical component in a Train, item of Equipment or Part, that Party shall immediately notify the other Party.
- (c) During the period when the Manufacturer holds the Design Authority role for any Train, Equipment or Part, and a Substandard Condition in a critical component is discovered by either Party in any relevant Train, item of Equipment or Part, which could lead to an unsafe condition and continued use of that critical component is desired by the Purchaser, then the Manufacturer shall be responsible for producing a justified CCSO pending rectification by the Purchaser or its nominee of both the defect and the underlying cause, in accordance with paragraph 10 of schedule 6 (Assurance).
- (d) Whilst the Manufacturer is the Design Authority it shall ensure that it establishes and maintains adequate technical knowledge, configuration knowledge and expertise for the purposes of:
 - (i) understanding the technical and operational requirements of the Trains and Equipment and retaining records identifying how these requirements influenced the design;

- (ii) developing, directing and managing the implementation of all interventions or works to the Trains and Equipment including, at the request of the Purchaser, any maintenance;
- (iii) maintaining information and advising on Modifications and/or proposed Modifications to the original design of the Trains and Equipment (including as modified by any prior Modifications) to ensure that such Modification does not have a detrimental effect on the safety or operational performance of the Trains and Equipment;
- (iv) approving any deviation from, or Modification to, the original design and providing assurance and, if requested, certification that any such deviation or Modification:
 - (A) complies with all Applicable Laws and Standards;
 - (B) complies with schedule 27 (Cyber Security);
 - (C) does not invalidate or adversely impact on the warranties provided by the Manufacturer to the Purchaser under this Agreement;
 - (D) does not infringe any party's Intellectual Property Rights;
 - (E) is (where relevant) consistent with the Train Technical Specification, design standards, assurance documentation and other Technical Documents; and
 - (F) is consistent with the safe and efficient provision of LUL Train Services by the Purchaser;
- (v) anticipating and managing the Obsolescence of any Subsystem or part of the Trains, MSA Spares, Special Tools or Equipment.

10.3 Liability for Performance / no design risk back to Purchaser

- (a) Notwithstanding any other provision of this Agreement, no examination or lack of examination and/or Assurance or Approval given by the Purchaser or its nominee of any document submitted by the Manufacturer in accordance with the requirements of the Assurance Regime or this Agreement shall in any respect relieve or absolve the Manufacturer from any obligation or liability under or in connection with this Agreement whether in relation to accuracy, safety, suitability, adequacy, performance, time or otherwise.
- (b) No involvement of the Purchaser or any Purchaser nominee in the Assurance Regime shall pass any design risk in respect of the Trains and the Equipment to the Purchaser. Design risk in respect of the Trains and the Equipment remains with the Manufacturer. All design risk in relation to a Train and/or any item of Equipment shall be borne by the Manufacturer regardless of any Assurance or Approval given.

10.4 Mock-ups

- (a) The Manufacturer shall build mock-ups (including the Saloon Mock-up, as required by this Agreement and in particular paragraph 6.1 of Part A: of schedule 7 (Testing and Inspection)) which comply with the requirements set out in the Train Technical Specification by no later than the dates set out in the Key Programme Dates.

- (b) The Manufacturer shall update the mock-ups referred to in clause 10.4(a) when necessary to reflect changes made as part of the Train and Equipment Design process for the relevant Fleet.
- (c) In any case, the Manufacturer shall ensure that reasonable access is provided to the Purchaser for the purposes of assessing the mock-ups referred to in clause 10.4(a).
- (d) The Manufacturer shall deliver and transfer to the Purchaser title to the Saloon Mock-up free and clear of all Security Interest with full title guarantee in accordance with the relevant Key Programme Dates.
- (e) The Manufacturer shall make the Saloon Mock-up available to the Purchaser at a location specified by the Purchaser (which may include the Manufacturer's Premises or other such suitable facilities) as instructed by the Purchaser.
- (f) The Manufacturer shall maintain a detailed log and photographic record (each of which shall be available to the Purchaser at all times) of all updates which are made to the mock-ups referred to in clause 10.4(a).

10.5 **Bill of Materials**

The Manufacturer shall:

- (a) keep the Bill of Materials updated to reflect any Changes made in accordance with the Change Procedure; and
- (b) provide to the Purchaser a final version of the Bill of Materials for Approval at the end of the Final Design Phase for the relevant Fleet.

10.6 **Saloon Hybrid Cooling**

- (a) The Manufacturer acknowledges that the Purchaser is considering the adoption of a Hybrid Cooling System.
- (b) The Manufacturer, when developing the Train and Equipment Design for the Base Order, shall give consideration to the incorporation of a Hybrid Cooling System in accordance with Appendix 2 to schedule 17 (Design Management) and shall include information within the Concept Design Submission for the Base Order which identifies whether such a system can be incorporated into the Train and Equipment Design.
- (c) If the Concept Design Submission demonstrates that a Hybrid Cooling System may be able to be incorporated into the Train and Equipment Design for the Base Order, the Purchaser may submit a Purchaser Change Notice to the Manufacturer requiring the Manufacturer to complete a Hybrid Cooling Development Project in accordance with Appendix 2 to schedule 17 (Design Management). The Manufacturer acknowledges that such Purchaser Change Notice may require implementation of Hybrid Cooling in relation to WLO Trains and/or retro-fitting to Base Order Trains.
- (d) If the Purchaser issues a Purchaser Change Notice pursuant to clause 10.6(c), the Manufacturer shall not be entitled to deliver an Initial Change Appraisal pursuant to paragraph 3.1 of Part B: of schedule 12 (Change Procedure) which includes an opinion in the terms set out in paragraph 2.1(a) of Part B: of schedule 12.

11. APPROVALS AND INFRASTRUCTURE

11.1 Licences and Consents

In carrying out its obligations under this Agreement, the Manufacturer shall:

- (a) obtain and maintain at all times any Relevant Approvals which the Manufacturer shall be required to hold under any Applicable Laws and Standards or which are otherwise required for the Manufacturer to perform the Works and carry out its other obligations under this Agreement;
- (b) be responsible for and bear the cost of preparing all materials necessary for each application for obtaining any such Relevant Approvals;
- (c) be responsible for obtaining an independent safety assessment of all safety submissions to Competent Authorities;
- (d) be responsible for liaising with all relevant parties in obtaining all Relevant Approvals including Competent Authorities; and
- (e) renew and/or update and/or obtain new Relevant Approvals where:
 - (i) either of the Parties wishes to change, in accordance with this Agreement or the FSA, any aspect of the design, manufacture, construction, maintenance or use of the Trains in a way which would invalidate an existing Relevant Approval or the Purchaser's Safety Certificate or Certificate of Technical Conformance; or
 - (ii) any Relevant Approval needs to be renewed; and/or
 - (iii) any Relevant Approval needs to be updated for any other reason in accordance with all Applicable Laws and Standards,

subject, in the case of clause 11.1(e)(i) only, to the Change Procedure.

11.2 Manufacturer Assistance for LUL Relevant Approvals

- (a) Without prejudice to the Manufacturer's obligations in clause 11.4, the Manufacturer shall provide to the Purchaser as soon as reasonably practicable any information relating to the Trains and/or the Purchased Items and/or their maintenance required in relation to any preparation/modification of the Purchaser's Safety Certificate and Certificate of Technical Conformance to accommodate operation of the Trains and/or Purchased Items.
- (b) Where a Relevant Approval may only be granted to an operator of rolling stock, the Purchaser shall make the formal presentation of the submissions for such Relevant Approval provided that the Manufacturer has supplied the required materials in accordance with this clause 11.
- (c) All documentation which the Manufacturer provides under this clause 11 shall be in a format so as to be suitable for submission to the applicable Competent Authority by the Purchaser without re-drafting.
- (d) The Purchaser shall prepare (or procure the preparation of) all documentation forming part of submissions to Competent Authorities for the Relevant Approvals which only the Purchaser, in its capacity as operator/future operator of the Trains, can prepare and which are therefore not within the Manufacturer's control provided that the Manufacturer has supplied the required materials in accordance with this clause 11.

11.3 Tax Allowances

The Manufacturer undertakes and confirms to the Purchaser that neither it nor any other person which is a member of the Manufacturer Group, a Subcontractor, a supplier or a provider of finance to the Manufacturer or any of those persons has claimed and that it will not claim and shall procure that no such other person shall claim any capital allowances or analogous Tax allowances in respect of any Train or any other Purchased Items.

11.4 Acceptance onto the LUL Network

- (a) The Manufacturer acknowledges and agrees that it will at its risk and cost do all things necessary to assist the Purchaser to obtain Route Acceptance of the Trains on the parts of the LUL Network where Network Rail is the Infrastructure Manager, and co-operate with the Purchaser to achieve compatibility of the Trains with the other parts of the LUL Network in accordance with clause 11.5 and in addition the Manufacturer shall, where requested to do so by the Purchaser, obtain and provide or procure the provision to the Purchaser of all documents and information relating to the Trains required to be provided by the relevant Infrastructure Manager in accordance with Applicable Laws and Standards.
- (b) The Purchaser shall carry out those things in relation to Route Acceptance on the parts of the LUL Network where Network Rail is the Infrastructure Manager, which in its capacity as an operator of passenger-carrying rolling stock, it is able to undertake, including making any amendments to the Purchaser's Safety Management System and the preparation and approval of the Safety Certificate and Certificate of Technical Conformance in relation to the testing and passenger service of the Trains, provided that, without prejudice to clause 11.4(a), the Manufacturer promptly provides the Purchaser with all necessary documentation and information regarding the Trains that are reasonably necessary for the Purchaser to amend its Safety Management System and prepare its Safety Certificate and Certificate of Technical Conformance.

11.5 ROGS

Without limiting the Manufacturer's general obligations in this Agreement to comply with Applicable Laws and Standards and Relevant Approvals, the Manufacturer shall comply with all obligations under the ROGS which relate to its obligations and activities under this Agreement including the obligation in regulation 22 of the ROGS to co-operate with transport operators.

11.6 Imports

Without prejudice to the generality of clause 7.2, the Manufacturer shall ensure that, to the extent applicable, all Purchased Items shall be imported in accordance with all Applicable Laws and Standards and the Manufacturer shall obtain all required approvals, licences and permits and pay or procure the payment of all taxes, import or export duties and tariffs relating to and/or incurred in connection with and/or arising out of the performance of the Works. The Manufacturer shall indemnify and keep indemnified the Indemnified Parties against all costs, damages and losses that any such person may suffer or that may arise as a result of and/or in connection with the importation of such Purchased Items into the United Kingdom. The Manufacturer, or any relevant Subcontractor(s) shall be the importer of record in respect of any of the Purchased Items which are subject to any Applicable Laws and Standards relating to the importation of goods into the United Kingdom.

12. TRAINING SERVICES

The Manufacturer shall provide, or procure the provision of, the training requirements set out in schedule 4 (Training) and in accordance with the Training Programme and the Key Programme Dates.

13. **TRAIN MAINTENANCE REGIME**

The Manufacturer shall provide to the Purchaser for Approval, not less than six (6) months before the intended date for Pre-Provisional Acceptance of the first Base Order Train as set out in the Key Programme Dates, a rolling stock train maintenance regime (including the Train Maintenance Plan) which shall demonstrate how the Purchaser shall maintain the Trains and Equipment in the Designated Depots (or, where an item of Equipment is located elsewhere, maintained in that location) in order to achieve the required levels of performance throughout the life of the Trains and Equipment as set out in the Train Technical Specification (based on the version of the Train and Equipment Design which has been Approved). Once such Train Maintenance Regime has been Approved, it shall, for the purposes of this Agreement, be the **"Train Maintenance Regime"** for the Base Order. The Manufacturer shall provide the maintenance documentation referred to in paragraph 2 of schedule 28 (Technical Information) in order to support the Train Maintenance Regime.

14. **TESTING AND CERTIFICATION**

14.1 **Compliance with Testing and Inspection Requirements**

The Manufacturer shall:

- (a) carry out testing on the Trains and Equipment in accordance with the Testing and Inspection Requirements, the Testing and Inspection Strategy, the Schedule of Tests and Inspections, the Testing and Inspection Programme, the Key Programme Dates, all Applicable Laws and Standards, all Relevant Approvals and all safety, quality and environmental requirements;
- (b) provide the results of the tests to the Purchaser on the dates specified in the Testing and Inspection Requirements and to meet the requirements for Acceptance (including (where permitted by this Agreement) the requirements for issue of Further Equipment with a Certificate of Conformance) in clause 15; and
- (c) ensure that the Testing and Inspection Programme shall incorporate all testing required to demonstrate compliance with the requirements of clause 14.1(a) and the Assurance Regime.

14.2 **Testing equipment and paths**

- (a) For the testing of each Train and each item of Equipment:
 - (i) the Purchaser shall secure paths and access rights for carrying out the LUL Network Testing in accordance with paragraph 10 of Part A: of schedule 7 (Testing and Inspection);
 - (ii) the Manufacturer shall secure paths and access rights for carrying out testing at the Test Track Facilities;
 - (iii) the Manufacturer shall make the Test Track Facilities available to the Purchaser and any relevant PDPs for, and facilitate, the fitment of the Test Track Facilities Integration Equipment;
 - (iv) where an item of Test Track Facilities Integration Equipment has not been provided by a PDP to the Purchaser, the Purchaser shall be entitled to waive (either in whole or in part, permanently or temporarily) the requirement to

fit that item of Test Track Facilities Integration Equipment and carry out any related testing, except that:

- (A) if the item of Test Track Facilities Integration Equipment has been provided by a PDP to the Purchaser prior to delivery to the Purchaser of the last Train in that Fleet, the Manufacturer shall make the Test Track Facilities available to the Purchaser and the relevant PDP for, and facilitate, the fitment of that item of Test Track Facilities Integration Equipment, and carry out any related testing at no extra cost for the Purchaser; and
 - (B) if the item of Test Track Facilities Integration Equipment has not been provided to the Purchaser before delivery of the last Train in that Fleet, the Purchaser shall be entitled to invoke a Purchaser Change under the Change Procedure if it requires the installation of that item of Test Track Facilities Integration Equipment and the carrying out of any related testing;
- (v) the Manufacturer shall appoint and provide a Facility Manager as set out in paragraph 5 of the Appendix to Part A: of schedule 7 (Testing and Inspection); and
- (vi) other than as set out in paragraph 10.5(b) of Part A: of schedule 7 (Testing and Inspection), the Manufacturer shall provide, procure or otherwise make available at its own cost all testing equipment, personnel, documentation and facilities (including the Test Track Facilities) in order to comply with its obligations under this Agreement (including for any repeat testing that may be required as a result of a Train or an item of Equipment not passing any tests or otherwise as required to obtain any Relevant Approvals or as required by Applicable Laws and Standards);
- (b) For the testing of each Train and each item of Equipment, the Purchaser shall procure the fitment of the Test Track Facilities Integration Equipment at the Test Track Facilities in accordance with Appendix 1 to Part A: of schedule 7 (Testing and Inspection), except to the extent the Purchaser has waived (either in whole or in part, permanently or temporarily) the requirement to test the Trains using the Test Track Facilities Integration Equipment.
- (c) The Purchaser shall not be obliged to provide access to the LUL Network for testing except as set out in schedule 7 (Testing and Inspection).
- (d) Without prejudice to clause 14.2(c), the Purchaser will use reasonable endeavours to assist in providing access or additional operators which the Manufacturer may require in order to carry out any re-tests or additional tests.
- (e) The Purchaser shall:
 - (i) subject to clause 14.2(e)(ii) below, not be required to provide operators to the Manufacturer for the purpose of carrying out any tests at the Test Track Facilities under schedule 7 (Testing and Inspection), but at the request of the Purchaser the Manufacturer shall provide access for the Purchaser's operators at the Test Track Facilities to participate in testing at the Test Track Facilities;
 - (ii) otherwise provide operators for LUL Network Testing in accordance with paragraph 10 of Part A: of schedule 7 (Testing and Inspection) the costs of such provision to be borne by the Manufacturer; and

- (iii) assist the Manufacturer in obtaining approval for carrying out testing in the relevant Designated Depots and on the LUL Network.
- (f) The Purchaser will facilitate communication between the Manufacturer and suppliers of Test Track Facilities Integration Equipment with regard to the Test Track Facilities, including by complying with its obligations in schedule 26 (Systems Integration).

14.3 Verification of Testing

- (a) No involvement by the Purchaser or any nominees either in the Assurance Regime or testing carried out pursuant to, or otherwise relating to the subject matter of, this Agreement (including in respect of the Trains and the Equipment) will result in any diminution of the responsibilities or obligations of the Manufacturer under this Agreement or any change in the allocation of risks and responsibilities set out in this Agreement. In particular the attendance at or otherwise the witnessing of any tests by the Purchaser and/or the nominees of either will not affect the obligations of the Manufacturer to comply with its obligations under this Agreement.
- (b) Each time there is a significant event (including any of the events listed in clause 9.3(b)(i)) in the production of the Trains or the Equipment, a design review, any testing or any other significant event, the Manufacturer shall provide the Purchaser with reasonable notice (having regard to the nature and location of the test) of the date upon which such event, review or testing is due to take place and the Purchaser and/or its nominee shall be entitled to attend, and the provisions of clause 7.10 shall apply.

14.4 No extension of time or adjustment

The Manufacturer acknowledges and agrees that compliance with its assurance obligations and the application of and implications of the Approval Process set out in Appendix 2 (Approval Process) to schedule 5 (Contract Management) shall not entitle it to:

- (a) any extension of time to any Contractual Acceptance Date in respect of any Train or item of Equipment or otherwise entitle the Manufacturer to any adjustment to the Key Programme Dates, the Project Programme or the Contract Price for any Purchased Item, the Total Contract Price, the Base Order Option Price for any Base Order Option, the Schedule of Milestones, or to any other relief or compensation in accordance with this Agreement; or
- (b) be reimbursed for any costs and expenses incurred or otherwise be compensated in any form or manner.

15. ACCEPTANCE OF TRAINS AND EQUIPMENT

15.1 General Acceptance requirements

The Manufacturer shall ensure that:

- (a) the Trains and Equipment are delivered, tested and made ready for Provisional Acceptance, Equipment Acceptance or (where permitted by this Agreement) delivered, tested and made ready for issue with a Certificate of Conformance (as applicable), and the Trains are delivered, tested and made ready for Final Acceptance and Fleet Acceptance in accordance with the Train Technical Requirements, the Key Programme Dates, the Testing and Inspection Programme and the procedures set out in the Assurance Regime;
- (b) no Train or Equipment is delivered to the Purchaser for Provisional Acceptance, Equipment Acceptance or (where permitted by this Agreement) with a Certificate of

Conformance (as applicable) prior to the relevant Contractual Acceptance Date (unless otherwise agreed by the Purchaser in its absolute discretion);

- (c) the rate of delivery for Pre-Provisional Acceptance and for Provisional Acceptance of the Trains does not exceed one Train per week (unless otherwise agreed by the Purchaser in its discretion acting reasonably);
- (d) the Trains and Equipment shall be Provisionally Accepted, Equipment Accepted or (where permitted by this Agreement) delivered with a Certificate of Conformance (as applicable) at the Designated Depot as notified by the Purchaser to the Manufacturer at least two (2) weeks prior to the relevant Contractual Acceptance Date; and
- (e) the Trains shall be delivered to the relevant Delivery Depot as notified by the Purchaser to the Manufacturer at least two (2) weeks prior to the relevant date for delivery set out in the Key Programme Dates.

Pre-Provisional Acceptance Criteria

15.2 Pre-Provisional Acceptance of any Train will only occur and the Purchaser shall only issue a Pre-Provisional Acceptance Certificate when the requirements set out in each of clauses 15.2(a) to 15.2(m) in respect of the Train presented for Pre-Provisional Acceptance have been satisfied:

- (a) the Manufacturer has delivered to the Purchaser all relevant contract documents (including all Technical Documents) due to have been delivered by the date of tender of the Train for Pre-Provisional Acceptance, evidence of successful completion of all testing due to have been carried out by that date, the Manuals, the Train Maintenance Regime, and evidence that all actions that are due to have been completed by that date pursuant to the Key Programme Dates have been completed and evidence that the Manufacturer has complied with all of its obligations under this Agreement which have fallen due by the date of such tender of the Train for Pre-Provisional Acceptance;
- (b) all testing has been carried out and all tests (on Trains and Equipment) have been passed in accordance with the Schedule of Tests and Inspections pursuant to schedule 7 (Testing and Inspection);
- (c) all training that the Manufacturer is required to have carried out by the date of tender of the Train for Pre-Provisional Acceptance has been carried out in accordance with schedule 4 (Training);
- (d) all Relevant Approvals have been obtained and the Train is in the requisite condition such that safe and meaningful LUL Network Testing can be carried out in accordance with all Relevant Approvals and Applicable Laws and Standards;
- (e) the Train Driving Simulators have been Accepted and are installed, fully functioning, and accurately reflect the systems, equipment, functionality and visual attributes of the relevant lines forming part of the DTUP in accordance with the requirements of clause 6.3(e) at the relevant time for Pre-Provisional Acceptance, at the Train Driving Simulator Locations in accordance with the Key Programme Dates;
- (f) the Manufacturer has fully reimbursed the Purchaser for any Manufacturer Depot Warranty Works that the Purchaser or a third party has undertaken or are to undertake pursuant to clause 7.11(c);
- (g) a valid Certificate of Technical Conformance has been granted;

- (h) a safe delivery method statement has been Approved;
- (i) the Manufacturer has delivered to the Purchaser a Train Logbook in respect of the relevant Train;
- (j) in relation to:
 - (i) the First and Second Pre-PAC Trains in the relevant Fleet, the reliability of each such Train when it is presented for Pre-Provisional Acceptance is at least 20,000 kilometres MDBTSAF (without the intervention of on-board technical support of the Manufacturer) and each such Train has achieved at least 5,000 consecutive kilometres without a Technical Failure occurring;
 - (ii) not used;
 - (iii) the Third to Fifth Pre-PAC Trains in the relevant Fleet, each such Train when it is presented for Pre-Provisional Acceptance has achieved at least 5,000 consecutive kilometres without a Technical Failure occurring, and the First and Second Pre-PAC Trains in the relevant Fleet have each achieved Pre-Provisional Acceptance; and
 - (iv) all Other Pre-PAC Trains in the relevant Fleet, each such Train when it is presented for Pre-Provisional Acceptance has achieved at least 1,000 consecutive kilometres without a Technical Failure occurring, and:
 - (A) the First and Second Pre-PAC Trains in the relevant Fleet have each achieved Pre-Provisional Acceptance; and
 - (B) at least one Train in the relevant Fleet has been Accepted and is in passenger service and the reliability of all Trains in the relevant Fleet that are in passenger service is at least 50,000 MDBSAF (without the intervention of on-board technical support of the Manufacturer) (taking the total number of kilometres run by all of the Trains in that Fleet that have previously been Accepted and dividing this by the number of Service Affecting Failures that have occurred), excluding any kilometres run for the purposes of the MDBTSAF calculation and test under clause 15.2(j)(i);
- (k) the Manufacturer has obtained Approval for Assurance Stage 3;
- (l) the Train has either met the Energy Consumption Test and Track Damage Assessment, or the Purchaser has elected to receive and has received payment of all applicable liquidated damages pursuant to clause 16.5; and
- (m) evidence that the Required Insurances required under Part C: of schedule 13 (Insurance) are in full force and effect and the Purchaser has received a letter in of undertaking in the form set out in Part D: (Broker's Letter of Undertaking) to schedule 13 (Insurance) in relation to those Required Insurances in each case, in respect of the relevant Fleet.

15.3 Where the conditions in clause 15.2 have been satisfied in respect of a Train then the Purchaser will:

- (a) issue a Pre-Provisional Acceptance Certificate in respect of that Train; and
- (b) make the Designated Depots available for use by the Manufacturer in accordance with the provisions of schedule 9 (Purchaser Depot Works) (such access being limited to (i) any scheduled tests that the Manufacturer is required to carry out in accordance with schedule 7 (Testing and Inspection)); and (ii) any maintenance

that the Manufacturer is required to carry out in order to satisfy its obligations in clause 15.5(j),

and the Train may be made available for LUL Network Testing provided that it is in an As New Condition.

15.3A **Qualified Pre-Provisional Acceptance**

If one or more of the conditions for Pre-Provisional Acceptance set out in clause 15.2 has not been satisfied in respect of a Train when the Train is tendered for Pre-Provisional Acceptance by the Manufacturer, and provided that the Purchaser is satisfied that the Train can nevertheless be delivered to London for relevant testing and commissioning, the Purchaser shall be entitled in its absolute discretion (and shall not be obliged) to issue a QPPAC in respect of that Train. The QPPAC shall list in detail the outstanding conditions to be satisfied and tasks to be performed by the Manufacturer in order for full Pre-Provisional Acceptance of the Train to occur (the "**Pre-Provisional Preconditions**") and require the Manufacturer to satisfy the Pre-Provisional Preconditions in accordance with a timetable set out in the relevant QPPAC, which timetable shall state that all Pre-Provisional Preconditions must in any event be completed on or before the date the Train is presented for Provisional Acceptance ("**Pre-Provisional Preconditions Timetable**").

15.4 **Provisional Acceptance Criteria**

The Provisional Acceptance Criteria for each Train are the following:

- (a) the Pre-Provisional Acceptance Certificate has been issued;
- (b) all Relevant Approvals to operate in Unrestricted Passenger Revenue Earning Service on the LUL Network have been obtained;
- (c) all testing has been carried out and all tests have been passed in accordance with the Schedule of Tests and Inspections and the Testing and Inspection Programme pursuant to schedule 7 (Testing and Inspection);
- (d) those items of Equipment which according to the Key Programme Dates are due to have been Accepted on or before the date on which the Train is to be presented for Provisional Acceptance have been Accepted;
- (e) not used;
- (f) no Corrective Actions in relation to the Train remain outstanding;
- (g) the Train Driving Simulators are fully functioning, continue to comply with the relevant requirements in the Train Technical Specification, and are fully up to date to accurately reflect the systems, equipment, functionality and visual attributes of the relevant lines forming part of the DTUP, in accordance with the requirements of clause 6.3(e), and are Fault Free;
- (h) the Train is presented in an As New Condition;
- (i) the Manufacturer has obtained Approval for Assurance Stage 5; and
- (j) the Manufacturer has delivered to the Purchaser an updated version of the Train Logbook provided at Pre-Provisional Acceptance in respect of the relevant Train.

15.5 **Provisional Acceptance**

The Manufacturer shall tender each Train for Provisional Acceptance at the Designated Depot by 12 noon on the Contractual Provisional Acceptance Date. The Purchaser shall not be obliged to accept a Train for Provisional Acceptance unless:

- (a) the Provisional Acceptance Criteria for the Train being presented for Provisional Acceptance have been satisfied;
- (b) the Manufacturer is otherwise in compliance with its obligations under schedule 4 (Training) to provide the training required under and in accordance with the Training Programme as at the relevant date;
- (c) such Train is Fault Free and there are no Recurrent Defects affecting the Trains across all of the Fleets;
- (d) the Manufacturer has updated the LUL Database to reflect the updated position in respect of the relevant Train and has complied with all of its obligations which have fallen due at the date of such tender for Provisional Acceptance under this Agreement in respect of the Technical Documents;
- (e) the Manufacturer has established the Technical Library, and the Manufacturer has updated the Technical Library such that it is up-to-date in accordance with clause 8.9;
- (f) for the first Train tendered for Provisional Acceptance, the Manufacturer has updated the Bill of Materials to reflect any amendments made in accordance with the Change Procedure, and for each subsequent Train tendered for Provisional Acceptance, the Manufacturer has further updated the Bill of Materials to reflect any amendments made in accordance with the Change Procedure;
- (g) adequate Base Order Spares have been delivered to the Purchaser at the Designated Depot and have achieved Equipment Acceptance, or (where permitted by this Agreement) have been supplied with a Certificate of Conformance, to carry out all of the activities set out in clause 7.15 for:
 - (i) all of the Trains and Equipment that have been Accepted, or (where permitted by this Agreement) supplied with a Certificate of Conformance, prior to that time; and
 - (ii) the specific Train and/or item of Equipment being tendered for Provisional Acceptance,

in each case for a period of 12 months following the relevant Contractual Acceptance Date, reflecting the Base Order Spares requirements for the Trains and Equipment for the forthcoming 12 month period set out in clauses 7.15(a) and 7.15(b);
- (h) a valid up to date Certificate of Technical Conformance has been issued by the Purchaser (updated from that achieved at Pre-Provisional Acceptance, as appropriate);
- (i) all Taxes due from the Manufacturer in respect of the Train relating to the period prior to Provisional Acceptance and all import duties in respect of the Train have been paid by the Manufacturer;
- (j) such Train has been maintained by the Manufacturer in accordance with the Train Maintenance Regime; and
- (k) the Pre-Provisional Preconditions set out in any QPPAC under clause 15.3A have been satisfied to the satisfaction of the Purchaser in respect of such Train.

- 15.6 Subject to clauses 7.11(f) and 15.1(c), where the conditions specified in clause 15.5 have been fulfilled with respect to a Train, the Purchaser shall issue a PAC with respect to such Train.
- 15.7 If the conditions specified in clause 15.5 have not been satisfied, the Purchaser shall issue to the Manufacturer, on the day of the relevant Train being tendered for Provisional Acceptance by the Manufacturer, either (i) a Purchaser Statement setting out which of the conditions specified in clause 15.5 have not been satisfied; or (ii) a QPAC in accordance with clause 15.10.
- 15.8 If the Manufacturer, acting reasonably, disputes any of the reasons set out in a Purchaser Statement, it shall notify the Purchaser of this in writing within five (5) Working Days after receipt of the Purchaser Statement and either Party may refer the matter as an Expert Dispute pursuant to schedule 19 (Dispute Resolution Procedure).
- 15.9 Following Provisional Acceptance or Qualified Provisional Acceptance of a Train, the Purchaser may commence operation of such Train in Unrestricted Passenger Revenue Earning Service and the Manufacturer shall at all times comply with the reasonable instructions of the Purchaser for the purposes of monitoring compliance with the conditions for Final Acceptance specified in clause 15.13.

15.10 **Qualified Provisional Acceptance**

If one or more of the conditions for Provisional Acceptance set out in clause 15.5 has not been satisfied in respect of a Train when the Train is tendered for Provisional Acceptance by the Manufacturer, and provided that the Train can nevertheless be operated safely and in accordance with all Applicable Laws and Standards and the terms of all Relevant Approvals, the Purchaser shall be entitled in its absolute discretion (and shall not be obliged) to issue a QPAC in respect of that Train. The QPAC shall list in detail the outstanding conditions to be satisfied and tasks to be performed by the Manufacturer in order for full Provisional Acceptance of the Train to occur (the "**Preconditions**") and require the Manufacturer to satisfy the Preconditions in accordance with a timetable set out in the relevant QPAC, which timetable shall state that all Preconditions must in any event be completed on or before the date on which Final Acceptance of the Train is scheduled to occur pursuant to the Key Programme Dates ("**Preconditions Timetable**").

15.11 **Precondition Retention**

- (a) In respect of each Train which has achieved a QPAC but not a PAC, the Purchaser shall be entitled to retain an amount from the Milestone Payment payable on QPAC or PAC until all of the Preconditions have been met (the "**Preconditions Retention**") which shall be an amount equal to 2 per cent of the Train Capital Cost for that Train.
- (b) When all of the Preconditions in a QPAC have been satisfied in respect of a Train, the Purchaser shall issue a PAC to the Manufacturer with respect to such Train, release the Preconditions Retention and pay such Preconditions Retention to the Manufacturer within 30 days of satisfaction of all such Preconditions for that Train.

Final Acceptance

- 15.12 The Manufacturer shall achieve Final Acceptance of each Train on the relevant Contractual Final Acceptance Date for that Train.
- 15.13 Final Acceptance of a Train shall occur when:
- (a) such Train has met all of the requirements for Provisional Acceptance and all of the Provisional Acceptance Criteria have been met in full;

- (b) such Train has achieved 100,000 kilometres MDBSAF on the LUL Network in Unrestricted Passenger Revenue Earning Service (and without the intervention of on-board technical support by the Manufacturer), excluding any kilometres run for the purposes of the MDBTSAF calculation and test under clause 15.4;
- (c) the Preconditions set out in any QPAC under clause 15.10 have been satisfied to the satisfaction of the Purchaser in respect of such Train;
- (d) such Train is Fault Free and there are no Recurrent Defects affecting the Trains (across all Fleets);
- (e) any Changes, Mandatory Modifications and Fault rectification due for completion prior to Final Acceptance of the relevant Train have been completed; and
- (f) the Manufacturer has updated the Technical Library such that it is up-to-date in accordance with clause 8.9 including to reflect any Modifications, Mandatory Modifications and Changes made to date to the Trains and Equipment such that the Technical Library is up to date.

15.14 Where the conditions specified in clause 15.13 have been satisfied with respect to a Train, the Purchaser shall issue a Final Acceptance Certificate to the Manufacturer with respect to such Train.

15.15 **Maintenance Cost**

- (a) The Purchaser shall measure the cost of maintenance for each Accepted Train from the date of Acceptance of the Train until the relevant Contractual Fleet Acceptance Date for the relevant Fleet (each a **"Train Maintenance Cost"**). The Manufacturer agrees to co-operate with the Purchaser in relation to the monitoring of such Train Maintenance Cost.
- (b) On or after the occurrence of the Contractual Fleet Acceptance Date for the relevant Fleet, the Purchaser will aggregate all Train Maintenance Costs for each TfL Period from issue of the first PAC or QPAC, if earlier, up to and including the relevant Contractual Fleet Acceptance Date (**"Fleet Maintenance Cost"**).
- (c) The Manufacturer shall use the Train Maintenance Cost and Fleet Maintenance Cost data collected pursuant to paragraphs (a) and (b) above to re-populate a copy of the relevant RSCOM in accordance with the instructions provided to the Manufacturer by the Purchaser and using the Bid Maintenance Cost adjusted for the actual distance travelled by the relevant Fleet so that the Maintenance Cost and the Bid Maintenance Cost are populated on a comparable basis and the Purchaser shall derive from the relevant RSCOM an NPV figure for maintaining a Fleet, such figure being the **"Maintenance Cost"**. When re-populating the relevant RSCOM, the Manufacturer shall use the actual mileage of the Fleet to date in place of the mileage contained in the "Kms" worksheet in the relevant RSTEM to enable a direct comparison of the Bid Maintenance Cost and the Maintenance Cost and clause 16.5(c) shall apply.

Fleet Acceptance

15.16 The Manufacturer shall achieve Fleet Acceptance by the Contractual Fleet Acceptance Date.

15.17 The Manufacturer shall make a submission for Fleet Acceptance to the Purchaser once the following Fleet Acceptance Criteria have been satisfied:

- (a) the ability of all Trains in the relevant Fleet to run with unconditional approval to operate from the relevant Competent Authority or such successor certificate which

allows Unrestricted Passenger Revenue Earning Service over all of the relevant parts of the LUL Network (except to the extent that any Relevant Approvals have not been obtained as a result of the Purchaser's breach of clause 11.2(d));

- (b) receipt by the Purchaser of all relevant up to date documentation for the relevant Fleet (including the Manufacturer having kept the LUL Database up to date) in accordance with clause 15.5(d) and the Technical Library is fully updated and up-to-date in accordance with clause 8.9;
 - (c) the Manufacturer has kept the Train Driving Simulators updated and fully reflects the systems, equipment, functionality and visual attributes of the relevant lines forming part of the DTUP in accordance with the requirements of clause 6.3(e);
 - (d) all Trains for the relevant Fleet have achieved Final Acceptance; and
 - (e) the performance and reliability of the relevant Fleet (taken as a whole, but excluding any Base Order Option Trains or WLO Additional Trains, as the case may be) has reached a level of at least 120,000 kilometres MDBSAF, during the period of the six (6) TfL Periods immediately preceding the date of Fleet Acceptance (taking the total number of kilometres run by all of the Trains in the Fleet and dividing this by the number of Service Affecting Failures that have occurred).
- 15.18 Upon Fleet Acceptance being obtained in accordance with clause 15.17, the Purchaser shall issue a Fleet Acceptance Certificate to the Manufacturer.

Equipment Acceptance

- 15.19 Subject to clause 15.24, the Manufacturer shall deliver and tender for Equipment Acceptance in accordance with the Key Programme Dates (and, in the case of Base Order Spares, on the basis set out in clause 7.15) the First-in-Class Equipment and/or the Train Driving Simulators at the relevant Designated Depot or such other location as may be notified by the Purchaser to the Manufacturer.
- 15.20 Subject to clause 15.24, the Purchaser shall not be obliged to accept the tender of any First-in-Class Equipment and/or any Train Driving Simulator for Equipment Acceptance, issue an Equipment Acceptance Certificate, nor (where permitted by this Agreement) accept delivery of any Further Equipment with a Certificate of Conformance, unless:
- (a) in the case of the Base Order Special Tools and the WLO Special Tools, the number and specification of the relevant Special Tools corresponds with that required (in schedule 8 (Spares and Special Tools)) to be Accepted on the relevant date pursuant to the Key Programme Dates and terms of this Agreement;
 - (b) in the case of the Base Order Spares and WLO Spares, such Base Order Spares and WLO Spares have been supplied in accordance with clause 7.15;
 - (c) the particular item of Equipment conforms with the appropriate part of the Train Technical Requirements;
 - (d) the particular item of Equipment complies with all Applicable Laws and Standards, has all Relevant Approvals and is Fault Free;
 - (e) the relevant Equipment Acceptance Tests for that Train Driving Simulator or item of First-in-Class Equipment have been successfully completed to the Purchaser's satisfaction;
 - (f) all training in relation to that item of Equipment that the Manufacturer is required to have carried out by that date has been carried out in accordance with schedule 4 (Training);

- (g) the Manufacturer has, up to the date of Equipment Acceptance, maintained the particular Train Driving Simulator or item of First-in-Class Equipment in accordance with the instructions for that Equipment;
- (h) the Manufacturer has fully reimbursed the Purchaser for any Manufacturer Depot Warranty Works that the Purchaser or a third party have undertaken, pursuant to clause 7.11(c);
- (i) in the case of the OTC – Infrastructure-Borne Equipment, the Manufacturer has verified, pursuant to clause 7.16(a)(ii), that the OTC – Infrastructure-Borne Equipment has been installed by the Purchaser in accordance with clause 7.16(a)(i)(A);
- (j) in the case of the Automatic Lineside Inspection Equipment, the Manufacturer has verified, pursuant to clause 7.16(b)(ii), that the Automatic Lineside Inspection Equipment has been installed by the Purchaser in accordance with clause 7.16(b)(i)(A);
- (k) in the case of a Train Driving Simulator:
 - (i) that Train Driving Simulator has been properly installed at the relevant Train Driving Simulator Location and all installation tests have been successfully completed to the satisfaction of the Purchaser; and
 - (ii) the Manufacturer has kept the Train Driving Simulators updated to accurately reflect the systems, equipment, functionality and visual attributes of the relevant lines forming part of the DTUP in accordance with the requirements of clause 6.3(e);
 - (iii) adequate Base Order Spares have been delivered to the Purchaser at the Designated Depot to enable the carrying out of all of the activities set out in clause 7.15 for:
 - (A) all of the Train Driving Simulators that have been Accepted prior to that time; and
 - (B) the specific Train Driving Simulator being tendered for Equipment Acceptance,

during the period of 12 months following the relevant Contractual Acceptance Date and reflecting the Base Order Spare requirements for Train Driving Simulators for the forthcoming 12 month period set out in the Train Maintenance Regime;
- (l) the Manufacturer has updated the Technical Library and the LUL Database such that it is up-to-date, and has confirmed that the Technical Library is up to date, both in accordance with clause 8.9, including to reflect any Modifications, Mandatory Modifications and Changes made to date to the Equipment;
- (m) adequate Base Order Spares have been delivered to the Purchaser at the Designated Depot, or such other location as may be notified by the Purchaser to the Manufacturer, to enable the carrying out of all of the activities set out in clause 7.15 for:
 - (i) all of the Equipment (except for the Train Driving Simulators) that has been Accepted or delivered with a Certificate of Conformance prior to that time; and

- (ii) the specific item of First-in-Class Equipment (except for the Train Driving Simulators) being tendered for Equipment Acceptance,

during the period of 12 months following the relevant Key Programme Date reflecting the Base Order Spare requirements for the Equipment for the forthcoming 12 month period set out in clauses 7.15(a) and 7.15(b); and

- (n) the Manufacturer has provided to the Purchaser a Train Driving Simulator Logbook in respect of the relevant Train Driving Simulator.

15.21 Where the conditions specified in clause 15.20 have been fulfilled, Equipment Acceptance of the relevant Train Driving Simulator or item of First-in-Class Equipment shall occur and the Purchaser shall issue to the Manufacturer an Equipment Acceptance Certificate in respect of that Train Driving Simulator or item of First-in-Class Equipment.

15.22 If the conditions specified in clause 15.20 have not been satisfied, the Purchaser shall issue to the Manufacturer, on the day on which the relevant Train Driving Simulator or First-in-Class Equipment is tendered for Acceptance by the Manufacturer, a Purchaser Statement setting out which of the conditions specified in clause 15.20 have not been satisfied.

15.23 If the Manufacturer, acting reasonably, disputes any of the reasons set out in the Purchaser Statement, it shall notify the Purchaser of this in writing within five (5) Working Days of receipt of the Purchaser Statement and either Party may refer the matter as an Expert Dispute for resolution pursuant to schedule 19 (Dispute Resolution Procedure).

15.24 **Certificate of Conformance**

- (a) Where the Manufacturer delivers to the Purchaser, at the relevant Designated Depot or such other location as may be notified by the Purchaser to the Manufacturer, any Equipment which is neither a Train Driving Simulator nor First-in-Class Equipment ("**Further Equipment**"), the Manufacturer shall not be required to tender the Further Equipment for Equipment Acceptance, but shall instead deliver to the Purchaser a Certificate of Conformance with such Further Equipment (including a confirmation that such Further Equipment meets all the conditions of clause 15.20).
- (b) Delivery of a Certificate of Conformance shall not in any respect relieve or absolve the Manufacturer from any of its obligations in relation to complying with the conditions for Equipment Acceptance set out in clause 15.20, other than the requirement to tender such Further Equipment for Equipment Acceptance.
- (c) The Purchaser shall be entitled at any time to inspect any of the Further Equipment which the Manufacturer has delivered with a Certificate of Conformance, to confirm that such Further Equipment meets the Equipment Acceptance Criteria and conforms in every way with the First-in-Class Equipment which received an Equipment Acceptance Certificate pursuant to clause 15.21.
- (d) If any Further Equipment does not conform in every way with the First-in-Class Equipment at the time of delivery to the Purchaser, then a Manufacturer Fault shall be deemed to have occurred and the Manufacturer shall rectify or replace such Further Equipment as soon as possible, and in any case to comply with its obligations in clause 7.15.

15.25 **Certificates**

The Parties agree that the issue of any certificate, document or notice under clause 14 (Testing and Certification), this clause 15 (Acceptance of Trains and Equipment) and/or schedule 7 (Testing and Inspection) shall not release, diminish or in any other way affect

the obligations of the Manufacturer under this Agreement nor shall it result in the Purchaser assuming any responsibility for the adequacy, completeness, condition and performance of the Trains and/or any Equipment. In particular, and without prejudice to the generality of the foregoing, the issue by the Purchaser of a QPPAC or a QPAC for a particular Train shall not imply that a QPPAC or a QPAC will be issued by the Purchaser for any other Train (and clauses 15.3A and 15.10 shall apply respectively).

16. ACCEPTANCE LIQUIDATED DAMAGES

16.1 Liquidated Damages for Delay to Trains

Subject to clause 16.3, if the Manufacturer does not obtain a PAC or a QPAC in respect of any Train on or prior to the Contractual Provisional Acceptance Date for that Train, the Manufacturer shall pay liquidated damages to the Purchaser in the amount of £10,000 (Indexed) for each day or part thereof after the relevant Contractual Provisional Acceptance Date for that Train until the actual date upon which a PAC or QPAC is issued in relation to that Train by the Purchaser and such liquidated damages shall (without prejudice to clause 30 (Manufacturer Default)) be the sole and exclusive remedy of the Purchaser in respect of such late delivery.

16.2 Liquidated Damages for Delay to Train Driving Simulators

Subject to clause 16.3, if the Manufacturer does not obtain Equipment Acceptance in respect of any Train Driving Simulator on or prior to the Train Driving Simulator Acceptance Date for that Train Driving Simulator in accordance with the Key Programme Dates, the Manufacturer shall pay liquidated damages to the Purchaser in the amount of £7,925.45 (Indexed) for each day or part thereof after the relevant Train Driving Simulator Acceptance Date until Acceptance of that Train Driving Simulator has occurred and such liquidated damages shall (without prejudice to clause 30 (Manufacturer Default)) be the sole and exclusive remedy of the Purchaser in respect of such late delivery.

16.3 Late Acceptance Liquidated Damages Cap

Subject to clause 16.4, the maximum liability of the Manufacturer to make payment of liquidated damages incurred pursuant to clauses 16.1 and 16.2 shall not exceed 20 per cent of the aggregate of the Total Contract Price from time to time (exclusive of VAT).

16.4 Application of Late Acceptance Liquidated Damages to Base Order Options

Where the Purchaser has served a Base Order Option Notice or a WLO Additional Trains Option Notice:

- (a) the Purchaser shall promptly revise the relevant Key Programme Dates to take into account each of the Contractual Acceptance Dates for the Base Order Option Trains or WLO Additional Trains, as the case may be, supplied or to be supplied by the Manufacturer and notify the Manufacturer of the same; and
- (b) upon receipt by the Manufacturer of a notice given pursuant to clause 16.4(a), the revised Key Programme Dates attached to the notice shall supersede and replace the existing Key Programme Dates and shall be incorporated in and form part of this Agreement.

16.5 Whole Life Cost Warranty

- (a) If a Train has not met the Energy Consumption Test, such that the ECT WLC Cost for a Train in the relevant Fleet is higher than the ECT Bid Cost for a Train, the Purchaser will give notice to the Manufacturer indicating the amount the Manufacturer is required to pay in liquidated damages, and the Purchaser shall be entitled, in its absolute discretion, to:

- (i) require the Manufacturer to pay liquidated damages to the Purchaser in the amount of the difference between:
 - (A) the ECT Bid Cost; and
 - (B) the ECT WLC Cost,

within 30 Working Days of the notification given above, and on receipt of payment by the Purchaser of the full amount, the relevant criterion for Pre-Provisional Acceptance shall have been met; or
 - (ii) elect not to receive liquidated damages pursuant to this clause 16.5, in which case the relevant criterion for Pre-Provisional Acceptance shall not be met.
- (b) If a Train has not met the Track Damage Assessment, such that the TDA WLC Cost for a Train in the relevant Fleet is higher than the TDA Bid Cost for a Train, the Purchaser will give notice to the Manufacturer indicating the amount the Manufacturer is required to pay in liquidated damages, and the Purchaser shall be entitled, in its absolute discretion, to:
- (i) require the Manufacturer to pay liquidated damages to the Purchaser in the amount of the difference between:
 - (A) the TDA Bid Cost; and
 - (B) the TDA WLC Cost,

within 30 Working Days of the notification given above, and on receipt of payment by the Purchaser of the full amount, the relevant criterion for Pre-Provisional Acceptance shall have been met; or
 - (ii) elect not to receive liquidated damages pursuant to this clause 16.5, in which case the relevant criterion for Pre-Provisional Acceptance shall not be met.
- (c) If, following the carrying out of the calculations in clause 15.15, the Maintenance Cost is higher than the Bid Maintenance Cost, the Purchaser will give notice to the Manufacturer indicating the amount the Manufacturer is required to pay in liquidated damages, and the Manufacturer shall be required to pay liquidated damages to the Purchaser in the amount of the difference between:
- (i) the Bid Maintenance Cost; and
 - (ii) the Maintenance Cost,
- within 30 Working Days of the notification given above.

16.6 **Determination and Payment of Liquidated Damages**

- (a) At any time after the last Working Day of a TfL Period in which liquidated damages have accrued under clauses 16.1 to 16.5, the Purchaser shall be entitled to determine in accordance with this clause 16 the amount of liquidated damages (if any) that the Manufacturer has incurred and shall notify the Manufacturer in writing of such amount of liquidated damages together with sufficient information to enable the Manufacturer, acting reasonably, to understand how such amount was determined (an "**LD Notice**").
- (b) The Purchaser shall be entitled, at its absolute discretion, to:

- (i) deduct the amount of liquidated damages determined under clause 16.6(a) above from any subsequent Milestone Payments or any other payments due to the Manufacturer; or
- (ii) require the Manufacturer to pay such liquidated damages to the Purchaser with ten (10) Working Days of its receipt of such LD Notice.

16.7 Genuine pre-estimate of loss

- (a) The Manufacturer acknowledges and agrees that the liquidated damages specified in clauses 16.1, 16.2, 16.4, 16.5 and 20.5 in each case represent a genuine pre-estimate of the Purchaser's Losses arising from the failure to provide a Train on the relevant Contractual Acceptance Date, a Train Driving Simulator on the relevant Train Driving Simulator Acceptance Date, a failure to meet the Energy Consumption Test or the Track Damage Assessment or the Maintenance Cost being higher than the Bid Maintenance Cost and the taking out of revenue earning service of a Train referred to in clause 20.5 (as applicable).
- (b) The Parties expressly undertake and agree that neither Party will:
 - (i) raise any claim of objection or defence challenging the validity of, or otherwise questioning the reasonableness of, the liquidated damages specified in clause 16.1, 16.2, 16.4, 16.5 or 20.5; or
 - (ii) bring any proceedings (including injunctive proceedings) challenging the Purchaser's rights to deduct amounts or the Manufacturer's obligation to pay amounts under clause 16.1, 16.2, 16.4, 16.5 or 20.5.
- (c) If the provisions for liquidated damages are held to be unenforceable as a result of a claim, objection, defence, dispute or proceedings raised or brought by the Manufacturer, the Manufacturer expressly agrees to pay to the Purchaser all Losses whatsoever (including loss of profit, loss of use and loss of production) incurred, suffered or payable by the Purchaser arising from or in consequence of the failure to provide a Train on the relevant Contractual Acceptance Date, a Train Driving Simulator on the relevant Train Driving Simulator Acceptance Date or the taking out of revenue earning service of a Train referred to in clause 20.5 (as applicable).

17. RELIEF EVENTS AND COMPENSATION EVENTS

17.1 Occurrence of a Relief Event

If and to the extent that a Relief Event:

- (a) is a direct cause of a delay in achieving a Contractual Acceptance Date for a Train or any other Purchased Item; and/or
- (b) adversely affects the ability of the Manufacturer to perform any of its obligations under this Agreement,

then (subject to clause 7.6(c)), the Manufacturer is entitled to apply for relief from any right of the Purchaser to terminate under clause 30 (Manufacturer Default):

- (i) including relief from termination as a result of breaching the relevant Train Longstop Date, but irrespective of such relief the Manufacturer shall remain responsible for the payment of liquidated damages pursuant to clauses 16.1, 16.2, 16.4, 16.5 and/or 20.5; and
- (ii) excluding the right to terminate pursuant to clause 30.1(i).

17.2 Obtaining relief from a Relief Event

- (a) To obtain relief the Manufacturer shall:
 - (i) as soon as practicable, and in any event within 20 Working Days after it becomes aware that the Relief Event has caused or is likely to cause delay and/or adversely affect the ability of the Manufacturer to perform its other obligations, give to the Purchaser a notice of its claim for relief from its obligations under this Agreement including full details of the nature of the Relief Event, the date of its occurrence and its likely duration;
 - (ii) within five (5) Working Days of receipt by the Purchaser of the notice referred to in clause 17.2(a)(i) above, give full details of the relief claimed; and
 - (iii) demonstrate to the reasonable satisfaction of the Purchaser that:
 - (A) the Manufacturer could not reasonably have foreseen the occurrence or consequence of the relevant Relief Event and could not have avoided such occurrence or consequences by steps which it might reasonably be expected to have taken, without incurring material expenditure;
 - (B) the Relief Event directly caused the need for relief;
 - (C) the relief from the obligations under this Agreement claimed could not reasonably be expected to be mitigated or recovered by the Manufacturer acting in accordance with Good Industry Practice, without incurring material expenditure; and
 - (D) the Manufacturer is using reasonable endeavours to perform its obligations under this Agreement.
- (b) If the Manufacturer has complied with its obligations in clause 17.2(a) above, then the Purchaser shall not be entitled to exercise its right to terminate this Agreement under clause 30 (Manufacturer Default) (other than in relation to clause 30.1(i)) as a result of and to the extent of any failure by or default of the Manufacturer arising from such Relief Event.
- (c) Nothing in this clause 17.2 shall affect any entitlement of the Purchaser to levy, and any obligation of the Manufacturer to pay, liquidated damages in accordance with clauses 16.1, 16.2, 16.4, 16.5 and/or 20.5 during the period in which the Relief Event is subsisting.

17.3 Obligation to mitigate the consequence of any Relief Event

The Manufacturer shall use all reasonable endeavours to mitigate the impact and consequence of any Relief Event and the Manufacturer shall not be entitled to any relief under this clause if and to the extent that the consequences of the Relief Event have arisen as a result of a failure by the Manufacturer to mitigate such consequences.

17.4 Delay in notification of a Relief Event

If the information required under clause 17.2 is provided after the specified dates then the Manufacturer shall not be entitled to any relief to the extent that the requirement for relief is increased as a result of the delay in providing such information.

17.5 Additional information in relation to a Relief Event

The Manufacturer shall notify the Purchaser within 15 Working Days if at any time it receives or becomes aware of any further information relating to the Relief Event, giving details of that information to the extent that such information is new or renders information previously submitted materially inaccurate or misleading.

17.6 Disputes relating to Relief Events

If the Parties cannot agree the extent of the relief required or the Purchaser disagrees that a Relief Event has occurred the Parties shall resolve the matter in accordance with the Dispute Resolution Procedure.

17.7 Occurrence of a Compensation Event

Subject to clause 7.6(c), if the occurrence of a Compensation Event:

- (a) is a direct cause of a delay in achieving a Contractual Acceptance Date for a Train or any other Purchased Item; and/or
- (b) prevents the Manufacturer from complying with, or has an adverse effect on the ability of the Manufacturer to perform any of its obligations under, this Agreement; and/or
- (c) results in the Manufacturer incurring any additional costs,

then the Manufacturer is entitled to apply for relief from its obligations and to claim Direct Losses under this Agreement and in doing so shall comply with the provisions of Part D: (Compensation Changes) of schedule 12 (Change Procedure).

17.8 Sole remedy for Compensation Events

Any compensation or relief agreed or determined under this clause 17 or Part D: (Compensation Changes) of schedule 12 (Change Procedure) shall be the Manufacturer's sole remedy in respect of the relevant Compensation Event.

18. TRANSFER OF TITLE AND RISK

18.1 Title in Trains and Equipment

Title and risk in the Trains and Equipment shall pass to the Purchaser or, at the Purchaser's discretion, the Purchaser's nominee (the "**Owner**"), from the date of the (a) issue of a QPAC or PAC (whichever is earlier); (b) issue of an Equipment Acceptance Certificate; or (c) (where permitted by this Agreement) delivery of a Certificate of Conformance, and in each case the Manufacturer warrants that such title shall be with full title guarantee and free and clear of all Security Interests.

18.2 Prohibition on Creating Security

- (a) The Manufacturer undertakes that it shall not, at any time:
 - (i) create; or
 - (ii) purport to create; or
 - (iii) permit to subsist,

any Security Interest over (A) any Train; and/or (B) any other Purchased Item (including any Manual or other documentation) or part thereof; and/or (C) any of the Works or any plant, materials and equipment used therein, and delivered in

accordance with this Agreement and which has been, or is to be, supplied to the Purchaser under and in accordance with the terms of this Agreement.

18.3 Ownership of Purchased Items

Without prejudice to clause 44.1, any reference in this Agreement to Purchased Items or other assets being supplied to, delivered to and/or owned by the Purchaser shall, in the event that another person has become the Owner be construed as a reference to Purchased Items or other assets being supplied to, delivered to or owned by such person.

18.4 Title in Train Data

Title and risk in the Train Data shall pass to the Purchaser or, at the Purchaser's discretion, the Owner, from the date of creation of such Train Data, and the Manufacturer warrants that such title shall be with full title guarantee and free and clear of all Security Interests with the Purchaser having the right to use the Train Data for any reason whatsoever.

19. INSURANCE

The Manufacturer and the Purchaser shall comply with the requirements of the insurance regime set out in schedule 13 (Insurance).

20. WARRANTIES

20.1 Design Life Warranty

The Manufacturer warrants to the Purchaser in respect of each Train that, on the date of Provisional Acceptance or Qualified Provisional Acceptance of a Train (whichever occurs first), such Train is designed for a 40-year service life subject to operation and maintenance of such Train in accordance with the Permitted Use, the Train Maintenance Regime and the Manuals (and clause 20.5 shall apply).

20.2 Major Component Warranty

- (a) The Component Life Warranty of each Major Component shall commence on the date of Provisional Acceptance or Qualified Provisional Acceptance (whichever occurs first) of the relevant Train on which that Major Component is installed (or, if the Major Component is provided and Accepted as an MSA Spare, the date of Acceptance or the date of installation of the Major Component on to a Train, if later).
- (b) If a Fault arises on any Major Component during the Component Life Warranty of such Major Component, the Manufacturer shall:
 - (i) in the case of any Fault which the Parties have not agreed is a Purchaser Fault, remedy the Fault as soon as possible (and in any case within such reasonable period as is notified to the Manufacturer by the Purchaser) and undertake necessary rectification (whether by Reconditioning or replacement) to such Train or Major Component and execute such rectification work (whether by Reconditioning or replacement) as may be required either:
 - (A) at the relevant Designated Depot; or
 - (B) at the Manufacturer's Premises, other Manufacturer site or any third party site in which case the Manufacturer shall arrange for the movement or transport of the relevant Train or Major Component to

and from such site to undertake such Reconditioning or replacement;
and

- (ii) where the Manufacturer fails to remedy such Fault within the reasonable period as is notified to the Manufacturer by the Purchaser (other than where clause 20.2(d) or 20.2(e) applies), at the request of the Purchaser, indemnify the Purchaser in respect of the full cost (including the cost of removal and transport of the Major Component) incurred by the Purchaser in rectifying, or procuring the rectification of, the Fault.
- (c) Within 20 Working Days of the date on which the affected Major Component was removed by the Purchaser and made available for collection or rectification at the Designated Depot by the Manufacturer, the Manufacturer shall:
 - (i) analyse such Major Component and provide a report or notification to the Purchaser, confirming details of the Fault that has occurred;
 - (ii) submit to the Purchaser its assessment of what further work is required for rectification of such Fault; and
 - (iii) submit to the Purchaser a determination of whether the Fault is a Manufacturer Fault or a Purchaser Fault, providing all supporting evidence as may be required by the Purchaser.
- (d) Where the Manufacturer demonstrates that the Fault was a Purchaser Fault, and the Purchaser agrees with this determination, then the costs of rectification and transport under this clause 20.2 shall be borne by the Purchaser.
- (e) Where the Parties agree that a Fault is a Purchaser Fault, the Manufacturer shall, at the Purchaser's cost, remedy the Fault as soon as possible and undertake necessary rectification (whether by Reconditioning or replacement) to such Train or Major Component and execute such rectification work (whether by Reconditioning or replacement) as may be required either:
 - (i) at the relevant Designated Depot; or
 - (ii) at the Manufacturer's Premises, other Manufacturer site or any third party site,

(and the Purchaser shall arrange and pay for the movement of a Train or Major Component to and from the Manufacturer's Premises, other Manufacturer site or any third party site where necessary to undertake such rectification) in order to permit the Major Component to operate with the rest of a Train in accordance with the Train Technical Requirements.

Major Component	Component Life Warranty
Bodyshell (structural integrity)	40 years
Couplers (structural integrity)	40 years
Axles	40 years
Traction gear boxes	20 years
Traction Motors	40 years
Paint system	10 years

Major Component	Component Life Warranty
Door leaves	40 years
Bogie Frames	40 years
Gangways (structural integrity)	20 years
Car Piping and Car Wiring	20 years

(f) In respect of any Major Component which is replaced or, where appropriate, Reconditioned:

- (i) as part of the remedy of a Fault in accordance with this clause 20.2(b); or
- (ii) as part of the remedy of a Fault in accordance with clause 20.2(e),

the Manufacturer shall provide the Purchaser with a new warranty in respect of such Major Component which shall commence on the date of delivery of the replacement or Reconditioned Major Component to the Purchaser for a further period equal to the remaining Component Life Warranty of the original Major Component. The provisions of this clause 20.2 shall apply to such replacement Major Component and Major Component warranty.

20.3 General Warranties

General Warranty for Train Warranty Period

- (a) This clause 20.3 applies without prejudice to clauses 20.2 and 20.4.
- (b) Without prejudice to clause 7.11(h), if a Fault arises on any Train, item of Equipment or Part during the Train Warranty Period, the Manufacturer shall:
 - (i) in the case of any Fault which the Parties have not agreed is a Purchaser Fault, remedy the Fault as soon as possible (and in any case within such reasonable period as is notified to the Manufacturer by the Purchaser) and undertake necessary rectification (whether by Reconditioning or replacement) to such Train, item of Equipment or Part and execute such rectification work (whether by Reconditioning or replacement) as may be required either:
 - (A) at the relevant Designated Depot; or
 - (B) at the Manufacturer's Premises, other Manufacturer site or any third party site in which case the Manufacturer shall arrange for the movement or transport of the relevant Train, Part or item of Equipment to and from such site to undertake such Reconditioning or replacement; and
 - (ii) where the Manufacturer fails to remedy such Fault within the reasonable period as is notified to the Manufacturer by the Purchaser (other than where clause 20.3(d) or 20.3(e) applies), at the request of the Purchaser, indemnify the Purchaser in respect of the full cost (including the cost of removal and transport of the Part) incurred by the Purchaser in rectifying, or procuring the rectification of, the Fault.

- (c) Within 20 Working Days of the date on which the affected Part was removed by the Purchaser and made available for collection or rectification at the Designated Depot by the Manufacturer, the Manufacturer shall:
 - (i) analyse such Part and provide a report or notification to the Purchaser, confirming details of the Fault that has occurred;
 - (ii) submit to the Purchaser its assessment of what further work is required for rectification of such Fault; and
 - (iii) submit to the Purchaser a determination of whether the Fault is a Manufacturer Fault or a Purchaser Fault, providing all supporting evidence as may be required by the Purchaser.
- (d) Where the Manufacturer demonstrates that the Fault was a Purchaser Fault, and the Purchaser agrees with this determination, then the costs of rectification and transport under this clause 20.3 shall be borne by the Purchaser.
- (e) Where the Parties agree that a Fault is a Purchaser Fault, the Manufacturer shall, at the Purchaser's cost, remedy the Fault as soon as possible and undertake necessary rectification (whether by Reconditioning or replacement) to such Train, item of Equipment or Part and execute such rectification work (whether by Reconditioning or replacement) as may be required either:
 - (i) at the relevant Designated Depot; or
 - (ii) at the Manufacturer's Premises, other Manufacturer site or any third party site,

(and the Purchaser shall arrange and pay for the movement of a Train, Part or item of Equipment to and from the Manufacturer's Premises, other Manufacturer site or any third party site where necessary to undertake such rectification) in order to permit the Part to operate with the rest of a Train or item of Equipment in accordance with the Train Technical Requirements.
- (f) In respect of any Part which is replaced or, where appropriate, Reconditioned:
 - (i) as part of the remedy of a Fault in accordance with this clause 20.3(b); or
 - (ii) as part of the remedy of a Fault in accordance with clause 20.3(e),

the Manufacturer shall provide the Purchaser with a new warranty in respect of such Part which shall commence on the date of delivery of such Part with its Certificate of Conformance back to the Purchaser and ending on the last day of the Train Warranty Period relevant to the Fleet into which the Part has been installed.

General Warranty for Parts

- (g) In respect of any Part which is replaced or, where appropriate, Reconditioned, the Manufacturer shall provide the Purchaser with a new warranty in respect of such Part which shall commence on the date of delivery of such Part with its Certificate of Conformance to the Purchaser and ending on the date which is two (2) years after the date of such delivery. The provisions of this clause 20.3 shall apply to such replacement Part and warranty for that Part.

20.4 Recurrent Defects

- (a) Without prejudice to clauses 20.2 and 20.3, if, during the Recurrent Defect Period, either Party becomes aware that a Recurrent Defect has occurred, that Party shall notify the other Party and the Manufacturer warrants to the Purchaser that it shall:
 - (i) remedy such Recurrent Defect as soon as possible from the date that the Manufacturer becomes aware of the Recurrent Defect (and in any case within such reasonable period as is notified to the Manufacturer by the Purchaser) and undertake equivalent rectification work on all Trains, items of Equipment and Parts as if the same Recurrent Defect had become apparent on such Train, item of Equipment or Part, in each case as may be required in order to enable all Trains, Spares, Consumables, Special Tools, Train Driving Simulators and Parts (as the case may be) to continue in Unrestricted Passenger Revenue Earning Service in compliance with the terms of this Agreement pending such rectification; and
 - (ii) where the Manufacturer fails to remedy such Recurrent Defect within the reasonable period as is notified to the Manufacturer by the Purchaser, at the request of the Purchaser, indemnify the Purchaser in respect of the full cost incurred by the Purchaser in carrying out, or procuring the carrying out, of such rectification work.
- (b) Within 20 Working Days after having been notified of such Recurrent Defect by the Purchaser, the Manufacturer shall submit to the Purchaser for Approval within a period of 28 Working Days a programme for the rectification work referred to in clause 20.4(a) as soon as is practicable, and pending this work being carried out, do such rectification work as may be feasible in order to enable such Trains, Spares, Consumables, Special Tools, Train Driving Simulators and Parts (as the case may be) to continue in Unrestricted Passenger Revenue Earning Service in compliance with the terms of this Agreement pending such rectification.

20.5 **Liquidated Damages for warranty work / Base Order Spares provision**

Without prejudice to the Manufacturer's other obligations under this Agreement, if a Train is taken out of, or is otherwise not available for, revenue earning service:

- (a) as a result of, or to rectify a Manufacturer Fault (including a Recurrent Defect) whether required by the Manufacturer or by/on behalf of the Purchaser, that the Manufacturer is obliged to remedy in accordance with this clause 20; or
- (b) as a result of the Manufacturer not:
 - (i) providing adequate Base Order Warranty Spares or Base Order Maintenance Spares at the relevant Designated Depot in accordance with clause 7.15(a); or
 - (ii) replenishing or Reconditioning Base Order Warranty Spares or Base Order Maintenance Spares as soon as reasonably practicable after they have been used in accordance with clause 7.15(c)(i); or
 - (iii) replenishing or Reconditioning Base Order Purchaser Fault Spares as soon as reasonably practicable after they have been used where the Manufacturer has been required to do so pursuant to clause 7.15(c)(ii),

the Manufacturer shall pay the Purchaser liquidated damages at the rate of £10,000 for each day or part thereof commencing on the date upon which the Train is removed from revenue-earning service up to and including the date upon which that Train (or Part) the subject of the relevant warranty work, maintenance or Fault rectification is returned to the Purchaser in a condition which enables the Purchaser to operate the Train in revenue-earning service.

20.6 Liquidated Damages for failure of OTC – Infrastructure-Borne Equipment

Without prejudice to the Manufacturer's other obligations under this Agreement, if during the Train Warranty Period a Train in passenger service does not stop (where it is scheduled to do so) at a platform at any station on the LUL Network as a result of a Manufacturer Fault in the OTC – Infrastructure-Borne Equipment, the Manufacturer shall pay to the Purchaser liquidated damages at the rate of £1,000 per each day on which any Train is unable to stop at any such platform (and where any Train is only prevented from stopping at a platform for part of a day, the amount payable by the Manufacturer shall be pro-rated to that proportion of the day during which that Train is unable to stop at such a platform).

20.7 The Manufacturer's liability to pay liquidated damages pursuant to either clause 20.5 or 20.6 shall be in full and final settlement in each case of any losses suffered by the Purchaser as a result of the Purchaser being unable to:

- (a) operate the relevant Train in revenue-earning service, including any delays to the service after revenue-earning service re-commences in the case of clause 20.5; or
- (b) operate all Trains with their scheduled platform stops in the case of clause 20.6,

but without prejudice to the Manufacturer's obligation to rectify, or indemnify the Purchaser in respect of, the Manufacturer Fault or failure of the OTC – Infrastructure-Borne Equipment or any other consequences of the Manufacturer Fault. The Manufacturer acknowledges and agrees that the liquidated damages specified in either clause 20.5 or 20.6 represent a genuine pre-estimate of the Purchaser's loss as a result of being unable to operate the Train, or operate all Trains with their scheduled platform stops, arising from the Fault or failure to which they relate.

20.8 Interface with Fleet Support Agreement

Where the provisions of this Agreement (including this clause 20) apply such that the Manufacturer is required to carry out work to rectify any Manufacturer Fault or Recurrent Defect or indemnify the Purchaser for the cost of procuring the repair by a third party or to carry out any obligation under this Agreement (or any Manufacturer obligation is otherwise covered by this Agreement), the Customer shall not be required to pay and the Manufacturer shall have no right to request the Purchaser or the Service Provider for such work/rectification or any related Services or advice under the Fleet Support Agreement.

20.9 Limitation on liability under warranties

The Manufacturer will not be liable under this clause 20 to the extent that a Manufacturer Fault results from a Modification which has not been performed by or on behalf of the Manufacturer so long as the Manufacturer is not in default in relation to such work or the Modification does not arise from a default by the Manufacturer under this Agreement and/or is not the subject of a Change Confirmation Notice.

20.10 Payments by the Purchaser

Amounts payable by the Purchaser under clauses 20.2(d), 20.2(e), 20.3(d), 20.3(e) and 20.5 shall be invoiced by the Manufacturer on the last Working Day of each TfL Period and paid by the Purchaser at the end of the TfL Period following the TfL Period in which the invoice is received, and the Total Contract Price shall increase by the actual amount paid.

20.11 Survival

The provisions of this clause 20 shall survive the expiry or termination of this Agreement.

21. RIGHT OF THE PURCHASER TO AUTHORISE WORK BY OTHERS

21.1 Right of the Purchaser to Perform Work

Without prejudice to any other right or remedy of the Purchaser under this Agreement, if the Manufacturer fails to provide any Purchased Item in accordance with, or fails to carry out any of its obligations under, this Agreement, the Purchaser may give the Manufacturer notice requiring the Manufacturer to supply that Purchased Item or carry out the relevant obligation within the period specified in such notice or, if none, within 30 days of the date of the notice. If the Manufacturer fails to supply the Purchased Item or carry out the relevant obligation the Purchaser may procure (providing it is acting reasonably) the supply of that Purchased Item or perform such obligation using its own or third party personnel and resources.

21.2 Recovery of Costs

Without prejudice to clauses 20.2 and 20.3, all costs and expenses properly and reasonably incurred (including labour at an hourly rate of £150 (Indexed)) by the Purchaser pursuant to clause 21.1, together with VAT chargeable thereon, shall be recoverable by the Purchaser from the Manufacturer within ten (10) Working Days of a demand from the Purchaser as a debt due and owing from the Manufacturer together with Default Interest from the date of demand until payment in full by the Manufacturer.

21.3 Relationship with Fault Rectification Obligations

- (a) Subject to clause 20.9 any remedial work undertaken by the Purchaser or a third party authorised by the Purchaser pursuant to this clause 21 shall not affect or relieve the Manufacturer of its obligation to comply with the requirements of clause 20 (Warranties) or any other provision of this Agreement or the Service Provider's obligations under the FSA, provided that the Manufacturer shall have the right (but no obligation) to supervise any Fault rectification work subject to the Purchaser's reasonable requirements.
- (b) The Parties acknowledge that the Customer shall have no obligation to pay any amount in respect of work under the Fleet Support Agreement for any payments that are covered by and included in payments made or to be made by the Purchaser under this Agreement for any work undertaken by the Manufacturer (or a third party authorised by the Manufacturer) in connection with the warranties provided by the Manufacturer under clause 20.

22. MANUFACTURING TOOLING

22.1 Notification of Manufacturing Tooling

Within 28 days of the date of Provisional Acceptance of the first Train in each Fleet presented for Provisional Acceptance, the Manufacturer shall provide to the Purchaser a list of all Manufacturing Tooling used in the manufacture of the Trains and the Equipment. This list shall be updated from time to time to reflect any changes in the list of Manufacturing Tooling.

22.2 Disposal of Manufacturing Tooling

The Manufacturer shall not dispose, and shall procure that no Subcontractor shall dispose, of any Manufacturing Tooling (other than where obsolete, defunct, damaged beyond repair, worn out or faulty and in each case replaced by a comparable item of Manufacturing Tooling) without the Manufacturer serving notice to the Purchaser a reasonable period in advance of the proposed disposal (including details of the original supplier in each such notice) (a "**Disposal Notice**"). Upon receipt of a Disposal Notice the Purchaser may either:

- (a) require the Manufacturer to manufacture or procure the manufacture of a quantity of Spares, Consumables and/or Special Tools of a type or types comprising the Base Order Warranty Spares, Base Order Special Tools, WLO Spares and/or WLO Special Tools specified by the Purchaser using such Manufacturing Tooling and offer to sell such Spares, Consumables and/or Special Tools to the Purchaser; or
- (b) require the Manufacturer to sell or procure the sale of the relevant Manufacturing Tooling to the Purchaser.

22.3 Final Run of Spares, Consumables and /or Special Tools

- (a) If the Purchaser notifies the Manufacturer within 90 days of receipt of a Disposal Notice that the Purchaser wishes to purchase a specified quantity of Spares, Consumables and/or Special Tools of the same type as pursuant to clause 22.2(a), the Manufacturer shall not be entitled to dispose and shall procure that any Subcontractor shall be entitled to dispose of the relevant Manufacturing Tooling until the relevant quantity of Spares, Consumables and Special Tools has been produced.
- (b) The Manufacturer shall supply the specified quantity of relevant Spare(s), Consumable(s) and/or Special Tool(s) in accordance with the instructions of the Purchaser.
- (c) The Purchaser shall pay the Manufacturer an amount equivalent to the sum of:
 - (i) the price for each Spare and Consumable (by reference to the relevant price set out in the relevant section in the Bill of Materials) ordered by the Purchaser multiplied by the quantity of the relevant Spares and Consumables specified by the Purchaser; and
 - (ii) the price for each Special Tool (by reference to the relevant price as set out in the Bill of Materials) ordered by the Purchaser multiplied by the quantity of the relevant Special Tools specified by the Purchaser,

immediately following Acceptance of, or (where permitted by this Agreement) delivery with a Certificate of Conformance with, such Spares, Consumables and/or Special Tools.

- (d) Legal and beneficial title to the Spares, Consumables and/or the Special Tools supplied by the Manufacturer pursuant to this clause 22 shall pass to the Purchaser on Acceptance of, or (where permitted by this Agreement) delivery of a Certificate of Conformance with, such Spares, Consumables and/or Special Tools, free from any Security Interest and with full title guarantee.

22.4 Sale and Purchase of Manufacturing Tooling

- (a) If the Purchaser notifies the Manufacturer within 90 days of receipt of a Disposal Notice that the Purchaser or its nominee wishes to acquire the Manufacturing Tooling the Manufacturer shall provide such Manufacturing Tooling to the Purchaser in consideration of the Purchaser paying the Manufacturer the amount of £1, or such higher amount representing its fair market value that the Manufacturer is able to demonstrate has been offered by a prospective arms-length purchaser who has the capacity to pay such higher price.
- (b) Upon notification by the Purchaser in accordance with clause 22.4(a), the Manufacturer shall as soon as reasonably practicable deliver (or procure the delivery of) the Manufacturing Tooling to any location specified by the Purchaser or its nominee. Legal and beneficial title to the Manufacturing Tooling shall pass to the Purchaser or its nominee (as the case may be) by delivery (or on payment by

the Purchaser if earlier), free from any Security Interest and with full title guarantee.

22.5 **Survival**

The provisions of this clause 22 shall:

- (a) survive the expiry or termination of this Agreement; and
- (b) be without prejudice to clause 7.15.

23. **FREE ISSUE MATERIALS**

23.1 **Pre-Specified Free Issue Materials**

- (a) Notwithstanding the provisions of clause 23.2, the Manufacturer acknowledges that the Purchaser shall be entitled to fit the Pre-Specified Free Issue Materials on to the Trains either:
 - (i) itself;
 - (ii) through the Manufacturer; or
 - (iii) using a third party (including any PDP as relevant).
- (b) The Purchaser shall give reasonable notice to the Manufacturer in the event that the Purchaser contracts with a third party in accordance with clause 23.1(a)(iii) above to fit Pre-Specified Free Issue Materials on to the Trains, and the Manufacturer shall act reasonably to provide the necessary access to and co-operate with such third party.
- (c) For the avoidance of doubt, the fitting of any Pre-Specified Free Issue Materials shall not be a Purchaser Change.

23.2 **Pre-Specified Free Issue Materials – third party interaction**

- (a) Without prejudice to clause 7.3, in relation to the integration of the Pre-Specified Free Issue Materials, the Manufacturer shall:
 - (i) liaise as required by, and under the direction of, the Purchaser, with the supplier of the Pre-Specified Free Issue Material (the "**PSFIM Supplier**") in relation to the particular Pre-Specified Free Issue Materials;
 - (ii) provide all reasonable assistance to the PSFIM Supplier to allow the PSFIM Supplier to perform their obligations relating to the Pre-Specified Free Issue Materials; and
 - (iii) perform any other activities as may be reasonably required by the Purchaser or PSFIM Supplier to support the successful operation of the relevant Pre-Specified Free Issue Materials and of the Train following fitment of the Pre-Specified Free Issue Materials.

23.3 **Free Issue Materials / third party provided equipment**

- (a) The Manufacturer acknowledges that the Purchaser shall be entitled to fit Free Issue Materials on to the Trains either:
 - (i) itself;

- (ii) through the Manufacturer; or
- (iii) using a third party.
- (b) Without prejudice to clause 23.1(c), regardless of whether it is the Manufacturer that fits the Free Issue Materials, any impact of the fitment of such Free Issue Materials on the obligations of the Manufacturer under this Agreement, whether during the Works or following Acceptance of a Train to which they are to be fitted, shall be dealt with under the Change Procedure.
- (c) Without prejudice to clauses 23.3(a) and 23.1(c), the Purchaser shall be entitled to invoke a Purchaser Change under the Change Procedure if it requires the installation on any Train of any Free Issue Materials.

23.4 **Survival**

The provisions of this clause 23 shall survive the expiry or termination of this Agreement.

24. **MILESTONES AND SECURITY**

The Purchaser and the Manufacturer shall comply with the provisions of schedule 10 (Milestones and Security).

25. **PAYMENTS AND VAT**

25.1 **Payments - Method of Payment**

- (a) Subject to clause 25.1(b), Milestone Payments and all other payments required to be made under this Agreement will be made for value on or prior to the date for payment in cleared funds to the payee's account at a bank in the United Kingdom (as the payee shall have notified to the payer by not less than three (3) Working Days' notice), free and clear of any deduction, withholding, set-off or counterclaim whatsoever, except to the extent required by any Applicable Laws and Standards, or in accordance with the express provisions of this Agreement (including clause 54 (Set Off)).
- (b) If the final due date for any payment falls on a day which is not a Working Day, payment shall be made on the next Working Day thereafter.

25.2 **VAT**

Subject to clause 28.6:

- (a) all amounts due under this Agreement are exclusive of VAT;
- (b) if any supply made or referred to in this Agreement is or becomes chargeable to VAT then the person receiving the supply (the "**Recipient**") shall in addition pay the person making the supply (the "**Supplier**") the amount of that VAT against receipt by the Recipient from the Supplier of a proper VAT invoice in respect of that supply;
- (c) where under this Agreement any amount is calculated by reference to any sum which has or may be incurred by any person on costs related to this Agreement, the amount shall include any VAT in respect of that amount only to the extent that such VAT is not recoverable as input tax by that person (or a member of the same VAT group), whether by set-off or repayment and where the Parties so agree in accordance with this Agreement; and

- (d) the Manufacturer shall provide the Purchaser with any information reasonably requested by the Purchaser in relation to the amount of VAT chargeable in accordance with this Agreement and payable by the Purchaser to the Manufacturer (and vice versa).

25.3 **Default Interest**

If any Party fails to pay any amount payable under this Agreement on or before the final date for payment, interest will accrue (both before and after judgment) on such unpaid amount from day to day (compounding on a monthly basis) during the period commencing on the final date for payment and ending on the date of payment in full, at the Default Rate. All such interest will be calculated on the basis of the actual number of days elapsed and a 365 day year and will be payable on demand of the non-defaulting Party.

25.4 **Payment denomination**

Subject to the Financial Close Protocol, all payments under this Agreement are denominated in, and shall be made in, Sterling.

26. **GUARANTEE**

The performance of the Manufacturer's obligations under this Agreement shall be guaranteed by the Guarantor pursuant to the Guarantee.

27. **CHANGE PROCEDURE**

27.1 **Purchaser Changes**

The provisions of Part A: (General) and Part B: (Purchaser Changes) of schedule 12 (Change Procedure) shall apply in respect of Purchaser Changes.

27.2 **Manufacturer Changes**

The provisions of Part A: (General) and Part C: (Manufacturer Changes) of schedule 12 (Change Procedure) shall apply in respect of Manufacturer Changes.

28. **CHANGE IN LAW**

28.1 **Change in Law**

If a Change in Law occurs, the Manufacturer shall comply with that Change in Law, such compliance to be at its own risk and cost, except where this Agreement expressly provides for the Purchaser to bear some or all of the costs of complying with the Change in Law.

28.2 **Consequences of a Qualifying Change in Law**

The Manufacturer shall only be entitled to compensation and/or to an extension of time for a Change in Law to the extent that:

- (a) it is a Qualifying Change in Law; and
- (b) the Manufacturer has complied with the provisions of Part D: (Compensation Changes) of schedule 12 (Change Procedure) which shall, subject to clause 28.3, apply in respect of any compensation and/or extension of time for the Manufacturer arising from a Qualifying Change in Law.

28.3 **General Change in Law as a Compensation Event**

For the purposes of Part D: (Compensation Changes) of schedule 12 (Change Procedure), where a General Change in Law arises which is a Qualifying Change in Law the Manufacturer shall only be entitled to claim compensation in respect of Capital Expenditure arising from the General Change in Law to the extent that the Manufacturer is not to bear responsibility for Capital Expenditure in accordance with clause 28.4.

28.4 General Change in Law

Where the Manufacturer incurs Capital Expenditure as a result of a General Change in Law which is a Qualifying Change in Law:

- (a) prior to the date which is four (4) years after the Commencement Date in relation to the Base Order, all increased Capital Expenditure required in relation to the Works shall be borne by the Manufacturer; or
- (b) on and from the date which is four (4) years after the Commencement Date in relation to the Base Order, any increased Capital Expenditure shall accrue and shall be borne by the Purchaser.

28.5 Requirement for Manufacturer Change

Where a Change in Law which is not a Qualifying Change in Law will require a Change, the Manufacturer shall request a Manufacturer Change in accordance with clause 27 (Change Procedure) and Part C: (Manufacturer Changes) of schedule 12 (Change Procedure).

28.6 Payment of Irrecoverable VAT

The Purchaser shall pay to the Manufacturer from time to time as the same is incurred by the Manufacturer sums equal to any Irrecoverable VAT but only to the extent that it arises as a result of a Change in Law. Any such payment shall be made within 28 days of the delivery by the Manufacturer to the Purchaser of written details of the amount involved accompanied by details as to the grounds for and computation of the amount claimed. For the purposes of this clause 28.6, "**Irrecoverable VAT**" means input VAT incurred by the Manufacturer on any supply which is made to it which is used or to be used exclusively in performing the Works (together with input VAT incurred as part of its overhead in relation to such activities) to the extent that the Manufacturer is not entitled to repayment or credit from HM Revenue & Customs in respect of such input VAT.

28.7 Mitigation

Without prejudice to paragraph 1.4 of Part D: (Compensation Changes) of schedule 12 (Change Procedure), the Manufacturer shall:

- (a) assist the Purchaser or its nominee in making any proposal to change, abolish or derogate from any Applicable Laws and Standards and shall suggest the making of any proposal for such change, abolition or derogation where to do so would assist the provider of the Works; and
- (b) in the event of any proposed Change in Law explore with any relevant Competent Authority steps to mitigate the effects of such Change in Law.

29. INTELLECTUAL PROPERTY RIGHTS

Ownership of IPR

- 29.1 Nothing in this Agreement shall operate to transfer any IPR of either Party (or of either Party's Affiliates or subcontractors) to any other person save to the extent set out in this Agreement.

29.2 Other than the Train Data, title to which shall pass to the Purchaser, all IPR developed or created by a Party, or on behalf of that Party, in the course of performing that Party's obligations under this Agreement, or any other Project Document, shall belong to that Party or its subcontractors, as appropriate.

29.3 **Licence granted by the Manufacturer**

The Manufacturer hereby grants to the Purchaser an irrevocable, perpetual, cost-free, assignable and non-exclusive licence (or sub-licence, as applicable), with the right to grant sub-licences to any number of tiers, of the Manufacturer IPR and the Third Party IPR including any IPR relating to or referred to in the FSA ("**FSA IPR**"), in each case for the purposes of:

- (a) the testing, commissioning, use, operation, maintenance, repair, modification (including any Modification), overhaul, refurbishment and upgrade, and any related activity (including Fault rectification or other works pursuant to clauses 20 (Warranties) and 21 (Right of the Purchaser to Authorise Work by Others)), (and/or procuring a third party to do so) in each case in respect of the Trains and the Equipment and any related equipment;
- (b) permitting the Purchaser to operate the Trains and use the Equipment and any other item supplied or to be supplied pursuant to this Agreement or the FSA for the purpose of providing the LUL Train Services and any activity related to the delivery of and integration with the LUL Network generally, including interfaces between the Trains and the LUL Network and its systems;
- (c) complying with all Applicable Laws and Standards and all Relevant Approvals and with any requests of a Competent Authority;
- (d) complying or co-operating with any enquiries made or carried out by the British Transport Police, the Purchaser, Network Rail, the RAIB, HMRI or the ORR (or any successor to any of their respective functions), or any other person carrying out any judicial or quasi-judicial function;
- (e) using and copying the Technical Documents, Technical Library and Train Support Software in order to perform any of the purposes specified in this clause 29.3 including accessing and copying any software required for using or accessing such documents and the Manufacturer's web-based applications for the Manuals;
- (f) training personnel to carry out any of the activities described in this clause 29.3;
- (g) operating and maintaining the equipment and facilities comprised in the Designated Depots;
- (h) allowing the Purchaser to perform, manage and operate the LUL Network and all related activities;
- (i) inviting tenders for any of the activities described in this clause 29.3;
- (j) the undertaking by contractors of works and services relating to the upgrade, renewal and extension to the LUL Network including designing, specifying, constructing, testing, commissioning, repairing, reconstructing, demolishing and modifying such infrastructure;
- (k) Approved Parties performing the Purchaser's obligations or exercising the Purchaser's rights under this Agreement pursuant to clause 5 (Relationship with LUL and Representatives);
- (l) the sale or scrapping of the Trains and Equipment;

- (m) on the acquisition pursuant to clause 22.4, the use of any Manufacturing Tooling for any purpose connected with the Trains, Equipment and/or the LUL Network;
- (n) the manufacture of any parts, spares or additional equipment which are required to interface with the Trains in order to ensure compatibility between the Trains and other trains acquired or operated or to be acquired or operated to provide the LUL Train Services; and
- (o) performing the Service Provider's obligations under the FSA (other than any manufacture of Spares and Consumables which is not otherwise within clause 29.4 or 29.5).

29.4 **Right to Build Out**

Without prejudice to clause 29.5, the Manufacturer hereby grants to the Purchaser an irrevocable, perpetual, cost-free, assignable and non-exclusive licence (or sub-licence, as applicable), with the right to grant sub-licences to any number of tiers, of the Manufacturer IPR in each case for the sole purpose of completing the manufacture of the Fleets and Equipment that have been ordered and/or are under construction at that time, including the further ongoing manufacture of Spares and Consumables on terms which are similar to the specifications of this Agreement. The licence granted pursuant to this clause 29.4 shall only take effect where:

- (a) this Agreement has been terminated or Partially Terminated as a result of the occurrence of a Manufacturer Event of Default; and
- (b) following such termination, the Parties have not agreed to replace this Agreement on substantially the same terms as this Agreement.

29.5 **New Trains and Equipment**

- (a) Without prejudice to clause 29.4, the Parties agree that the Purchaser shall be entitled to manufacture or procure the manufacture of additional trains and related equipment, special tools and spares for use on the LUL Network which replicate in some or all material respects the features and capabilities set out in clause 29.5(b) below (the "**Train Features**").
- (b) The Train Features are the following features as they exist (in whole or in part) on (A) the Trains and/or the Equipment from time to time provided or procured by the Manufacturer under this Agreement; and/or (B) the FSA Purchased Items provided or procured by the Service Provider under the FSA:
 - (i) the Interior Features and the Exterior Features;
 - (ii) inter-car gangways and detrainment facilities of the Trains;
 - (iii) train engagement points with respect to crashworthiness;
 - (iv) the location and layout on the Trains of the following train operator interfaces: traction and braking control; functions and positions; internal, external and overall cab layout including train operator sight lines; cab controls and visual and audible displays and contents; door controls including internal and external door releases; saloon controls; and train management system (TMS) messages; and logic and other data;
 - (v) the location and layout on the Trains of the following: train and car length; bogie location and wheelbase; cab and saloon door size and positions; shed receptacles design and location; shoe gear locations; jacking points; external indicators; and consumables filling points design and location;

- (vi) the functionality on the Trains of the following inter-train train recovery interfaces: mechanical coupler interface; and cab to cab communications between trains; and
- (vii) the functionality on the Trains of the following relating to performance: traction performance curves.
- (c) Without prejudice to the provisions of clause 29.1, clause 29.3 and clause 29.4, the Manufacturer hereby grants to the Purchaser an irrevocable, perpetual, cost-free, assignable, and non-exclusive licence (or sub-licence, as applicable) with the right to grant sub-licences to any number of tiers of the Manufacturer IPR, the Third Party IPR and the FSA IPR in the Train Features in order to manufacture or procure the manufacture of new trains and all Equipment, including Spares, Consumables and Special Tools that might be necessary or desirable in connection with such new trains, in each case for any or all of the purposes set out in clauses 29.3 and 29.5(a).

29.6 **Documentation**

Upon request from the Purchaser, the Manufacturer shall execute such further documents, and do such other things, as the Purchaser may reasonably request in order to obtain for the Purchaser the full benefit of this clause 29, at no cost to the Purchaser.

29.7 **Manufacturer representation and warranty**

The Manufacturer represents and warrants to the Purchaser that:

- (a) in:
 - (i) doing any of those things referred to in clause 29.3, clause 29.4, clause 29.5 and clause 29.12, neither the Purchaser nor any of its sub-licensees, of whatever tier; and
 - (ii) in performing its obligations under this Agreement, neither the Manufacturer nor any Subcontractors,

will infringe or make unauthorised use of any IPR of any person; and
- (b) for the purposes of:
 - (i) doing any of those things referred to in clause 29.3, clause 29.4, clause 29.5 and clause 29.12, the Purchaser and each of its sub-licensees of whatever tier, is granted a licence from the Manufacturer for all such purposes, carrying with it the right to grant the sub-licences as referred to in this clause 29 in respect of all the relevant IPR; and
 - (ii) performing its obligations under this Agreement, the Manufacturer and each Subcontractor has either:
 - (A) sole and absolute legal and beneficial title free from all encumbrances; or
 - (B) a licence from a third party for all such purposes referred to in this clause 29 in respect of all the relevant IPR.

29.8 **Manufacturer indemnity**

Without prejudice to:

- (a) clause 29.7; or
- (b) the ability of the Purchaser to claim damages, on any basis available to it, in the event that any of the representations or warranties in clause 29.7 proves to be untrue or misleading or is breached (as the case may be),

the Manufacturer shall indemnify and pay the Indemnified Parties, on demand, the amount necessary to put all such Indemnified Parties and each of their sub-licensees into the position which would have existed if the said representations and warranties had been true and not misleading or not broken (as the case may be), together with all Losses incurred by them as a result of such breach.

29.9 **Remedy for infringement**

Without prejudice to clause 29.7, if in the reasonable opinion of the Purchaser the carrying out of any of the activities in clause 29.3, clause 29.4, clause 29.5 and clause 29.12 might infringe the IPR of a third party ("**Infringement**") the Manufacturer shall, at its own expense, either:

- (a) procure for the Purchaser (and its sub-licensees) a licence to use such IPR as may be applicable in order to remove the risk of such Infringement arising; or
- (b) at the Purchaser's election, either:
 - (i) modify such Train, Equipment or other Technical Documents, Software or Source Code as may be applicable to remove the risk of such Infringement arising; or
 - (ii) replace such Train, Equipment or other Technical Documents, Software or Source Code to remove the risk of such Infringement arising,

provided however that the modification or replacement shall at all times comply with all the requirements of this Agreement and the FSA.

29.10 **Software**

- (a) The Manufacturer shall ensure in respect of all Software that is used for the design, manufacture, construction, testing, commissioning, supply, use, operation, maintenance, modification, integration or refurbishment of any Train, Equipment and/or any Part or component forming part of a Train and/or any item of Equipment that:
 - (i) there is orderly documented progress from the functional requirements to the final code and provision for regular verification and testing at each stage of the Train and Equipment Design process;
 - (ii) the documentation for such Software is such as to enable an appropriately qualified person (who was not involved in the original design) to relate the Software to the performance of the relevant equipment under normal and fault conditions and to verify its compliance with the functional requirements of that equipment; and
 - (iii) where no particular standard is specified by the Train Technical Requirements, and without prejudice to schedule 27 (Cyber Security), it is designed to the appropriate level of safety integrity required by Good Industry Practice and documented following a nationally or internationally recognised standard using recognised quality control methods.

- (b) The Manufacturer shall in respect of Software owned by the Manufacturer or any Subcontractor, at all times during the period from the Commencement Date until the end of the 40-year design life of each Train:
 - (i) retain updated "as made" copies, in machine readable form, of the final structure of the Software, and of the intermediate stages leading to it (including Source Code and object codes);
 - (ii) retain updated usable copies of any ancillary computer programs used to generate such codes (including compilers);
 - (iii) without prejudice to the provisions of any Escrow Agreement entered into under clause 29.12 (or any escrow agreement that may be entered into under the FSA), keep copies of the materials referred to in this clause 29.10 in a secure manner and place such that they will not deteriorate;
 - (iv) retain the Software (including Source Code) designed by the Manufacturer and/or any Subcontractor; and
 - (v) allow the Purchaser reasonable access to the Software (excluding the Source Code) and all relevant documentation.
- (c) The Manufacturer shall supply to the Purchaser all Software used to:
 - (i) update Train and Equipment software and parameters (including all related encryption software);
 - (ii) download and interpret recorded Train Data; and
 - (iii) interface with the Trains and Equipment,
 collectively the **"Train Support Software"**.
- (d) The Train Support Software shall be compatible with standard PC operating platforms and suitable for installation on industry standard laptop PCs, tablets and equivalent standard portable electronic devices.
- (e) The Train Support Software used to analyse Train Data shall provide an export of raw and interpreted data in an open format that can be loaded into applications such as the Microsoft Office applications Word, Excel and PowerPoint.

29.11 **Cessation of Software Support**

If the Manufacturer or any Subcontractor supplying any of the Software stops trading or withdraws (or makes known its intention to withdraw) support for that Software, the Manufacturer shall, without additional charge, use reasonable endeavours to procure the transfer to the Purchaser of all rights in and to the Software in question for the Trains or the relevant type of Equipment or enter into reasonable alternative arrangements to ensure continued supply and support of such Software for the purposes of this Agreement.

29.12 **Escrow Agreement**

- (a) The Manufacturer and the Purchaser shall have executed the Escrow Agreement with respect to the Source Code and the Software in the form contained in Part A: (Software Escrow Agreement) of schedule 23 (Intellectual Property) and shall have procured that the Escrow Agent has also signed such Escrow Agreement prior to the Commencement Date (or such later date agreed by the Purchaser) in accordance with clause 2.3(d).

- (b) The Manufacturer shall place the Source Code and any relevant Software and any Source Code and any relevant Software provided by the Service Provider pursuant to the FSA (the "**Escrow Material**"), in escrow with the Escrow Agent on the terms set out in the Escrow Agreement as soon as reasonably possible after its completion and in any event within 28 days of the commencement of the Testing and Inspection Programme (in the case of all such Escrow Material in existence by that date). Thereafter the Manufacturer shall update (and in respect of any Escrow Material provided under the FSA, shall procure that the Service Provider shall effect updates of) the version of the Source Code in escrow:
 - (i) immediately after the respective close out meeting following Assurance of the Final Design Submission as set out in paragraph 8 of schedule 17 (Design Management);
 - (ii) on Provisional Acceptance of the first Train to be Provisionally Accepted;
 - (iii) on Final Acceptance of the final Train to be Finally Accepted; and
 - (iv) on Fleet Acceptance,

unless the Escrow Agreement states more frequently in which case the Manufacturer shall update (and in respect of any Escrow Material provided under the FSA, shall procure that the Service Provider shall update) the Source Code in escrow in accordance with this clause 29.12(b) and the Escrow Agreement. Thereafter, the Manufacturer shall update (and in respect of any Escrow Material provided under the FSA, shall procure that the Service Provider shall update) within 20 Working Days of any Change and any FSA Variation Order (as defined in the FSA) that may impact on the Software and every time the Software is updated, and the Manufacturer shall ensure (and in respect of any Escrow Material provided under the FSA, shall procure that the Service Provider shall ensure) that the Source Code shall be up to date on any termination of this Agreement.
- (c) The Manufacturer and the Purchaser shall pay the fees of the Escrow Agent in connection with the placement, storage and release of the Source Code in the proportions set out in the Escrow Agreement.
- (d) Without prejudice to clause 29.3, clause 29.4 and clause 29.5, the Manufacturer hereby grants to the Purchaser a perpetual, non-exclusive, irrevocable, cost-free licence to use, reproduce, modify, adapt and enhance the Source Code and to authorise a third party to do so for all of the purposes set out in clauses 29.3 to 29.5 (including those purposes that relate to the FSA). The Purchaser shall be entitled to grant sub-licences and to assign this licence provided that the licence granted under this clause 29.12(d) shall only become effective if the Purchaser becomes entitled to obtain access to the Source Code pursuant to the terms of the Escrow Agreement.
- (e) The Escrow Material shall be released to the Purchaser on the occurrence of an Escrow Release Event pursuant to the Escrow Agreement.

29.13 **Corporate IPRs and Train Data**

- (a) Without limiting clause 29.1, the Purchaser (or relevant member of the TfL Group) retains all rights and interests to IPR owned by the Purchaser or any member of the TfL Group and the Manufacturer shall obtain no rights or interest to any such IPR other than as set out in this clause 29.13.
- (b) The Manufacturer shall be liable for all acts and omissions of any person to whom it sub-licenses any Corporate IPR or Train Data that, if done or omitted to be done by the Manufacturer, would be a breach of the licences granted to the Manufacturer

pursuant to this clause 29 or would otherwise breach any of the obligations of the Manufacturer contained in this clause 29.

- (c) The Purchaser hereby grants to the Manufacturer a non-exclusive, non-transferable, royalty-free licence to the Manufacturer to use, and allow its Subcontractors to use, the Corporate IPRs and the Train Data for the duration of this Agreement for the sole purpose of enabling the Manufacturer to comply with its obligations under this Agreement and the Service Provider's obligations under the FSA.
- (d) The Manufacturer shall use, and shall procure that its Subcontractors and the Service Provider shall use, the Corporate IPRs and Train Data in compliance with this Agreement, the FSA, Applicable Laws and Standards, the standards set out in Part B: (Corporate IPR) of schedule 23 (Intellectual Property) and any other applicable guidelines or policies relating to use of Purchaser's trademarks as notified by the Purchaser to the Manufacturer.
- (e) The Manufacturer shall not use, and shall procure that its Subcontractors shall not use, the Corporate IPRs or Train Data in combination with any other IPR without the Purchaser's prior written consent, in the Purchaser's absolute discretion.
- (f) On written request by the Purchaser, the Manufacturer shall supply to the Purchaser copies or details of items on or in relation to which it uses the Corporate IPRs or Train Data or (as requested) details of the manner in which either are used (in addition to any such information in Part B: (Corporate IPR) of schedule 23 (Intellectual Property)). If the Purchaser reasonably determines that any use of the Corporate IPRs or Train Data falls below the standards set out in Part B: (Corporate IPR) of schedule 23 (Intellectual Property) and/or the standards referred to in clause 29.13(d) or is not otherwise permitted by this Agreement, the Purchaser shall give the Manufacturer written notice of that fact and the Manufacturer shall correct the use so as to comply with the Applicable Laws and Standards taking into account the Purchaser's instructions.
- (g) The Manufacturer or its Subcontractors shall not be entitled to bring any action against any third party for infringement relating to the Corporate IPRs or Train Data and the Purchaser shall not be obliged to bring or extend any proceedings relating to the Corporate IPRs or Train Data if it decides in its sole discretion not to do so.
- (h) As soon as reasonably practicable after expiry or termination of this Agreement for any reason, the Manufacturer and its Subcontractors shall remove or destroy any Corporate IPRs and any Train Data that are not on the Trains or any Purchased Items or FSA Purchased Items or, if the Purchaser so elects, deliver such Corporate IPRs and Train Data and all related items and documents to the Purchaser or any other company or person designated by the Purchaser for that purpose.

29.14 Branding and advertising

- (a) The Manufacturer acknowledges that all advertising on the Trains shall be the responsibility and domain of the Purchaser, and the Manufacturer has no right to place any advertising on to the Trains other than at the specific request of the Purchaser (or the Purchaser's nominee). Any revenue from any advertising placed on the Trains shall be for the benefit of the Purchaser.
- (b) The Manufacturer shall not, and shall procure that third parties including the Service Provider (except the Purchaser and any other third party approved in writing by the Purchaser) shall not:

- (i) use:
 - (A) any of their trademarks, service marks, symbols, logos, company names, trade names, domain names, designs, get-up, livery, taglines, advertising or other indicators of origin; or
 - (B) any marketing, promotional and/or advertising material, in any media (whether now known or hereafter developed, including any printed media, display screen, transmission and/or telecommunications system),

on or in any part (including any interior or external surface) of any Train that is visible to passengers during normal operation; or
- (ii) authorise, permit, procure, assist or enable any third party to do any of the acts referred to in clause 29.14(b)(i).

29.15 Language

Except to the extent required by local patent registries, all documents which contain or show evidence of IPR licensed under this Agreement by the Manufacturer shall be in English. Where a document containing or showing evidence of IPR is in a language other than English, the Manufacturer shall provide a translation into English.

29.16 Joint development of IPR

- (a) The Parties acknowledge that any Specially Designed IPR resulting from a Joint Development is Manufacturer IPR (or Third Party IPR) and is accordingly subject to the provisions of this Agreement which relate to Manufacturer IPR (or Third Party IPR) including clause 29.3.
- (b) The Manufacturer shall not commercially exploit any Specially Designed IPR without prior written consent from the Purchaser, and subject to the agreement between the Parties of a suitable gainshare mechanism for the profit generated by such exploitation, such consent not to be unreasonably withheld or delayed.

29.17 Survival

The provisions of this clause 29 shall survive the expiry or termination of this Agreement.

30. MANUFACTURER DEFAULT

30.1 Manufacturer Events of Default

The occurrence of one or more of the following shall constitute a Manufacturer Event of Default:

- (a) an Insolvency Event occurs in relation to the Manufacturer or the Guarantor;
- (b) the Manufacturer fails to make payment of any sum(s) (including any liquidated damages) which are not in dispute and which either singly or in aggregate exceeds £100,000 (Indexed), when due and payable to the Purchaser in accordance with this Agreement and which remains unpaid 30 days after a written demand for payment from the Purchaser;
- (c) the Manufacturer commits a material breach of its obligations under this Agreement, other than breaches of the nature set out in the other sub-clauses of this clause 30.1;

- (d) the occurrence of a Persistent Breach;
- (e) a Change of Control occurs in relation to the Manufacturer to which the Purchaser has not consented;
- (f) Acceptance of any Train has not occurred on or before the Train Longstop Date for that Train;
- (g) the Manufacturer abandons, without any intention to resume, the Works or any material part thereof;
- (h) there is a breach by the Manufacturer of its obligations under clause 43 (Assignment, Transfer and Sub Contracting by the Manufacturer) or clause 44 (Assignment and Novation or Granting of Security by the Purchaser);
- (i) the maximum amount of liquidated damages payable by the Manufacturer pursuant to clause 16.3 shall have accrued unless by mutual agreement the Parties have agreed to increase such maximum amount;
- (j) the Manufacturer commits a breach of clause 9.1 (Manufacturing Facilities);
- (k) the Manufacturer fails to take out and/or maintain any of the insurances required in accordance with the provisions of clause 19 (Insurance) and schedule 13 (Insurance);
- (l) a Guarantee Event occurs and the Manufacturer fails to procure a replacement valid and enforceable guarantee on terms reasonably satisfactory to the Purchaser (acting in its absolute discretion) together with any supporting legal opinions reasonably requested by the Purchaser within five (5) Working Days of such Guarantee Event;
- (m) the Guarantor or an Advance Payment Bond Provider fails to comply with any payment or performance obligations expressed to be assumed by it in the Guarantee or any Advance Payment Bond;
- (n) a Bond Event occurs or any other event that causes the Manufacturer to extend or replace any Advance Payment Bond or provide alternative security in each case as required by the relevant provisions of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security) and the Manufacturer fails to extend or replace the relevant Advance Payment Bond or provide alternative security in accordance with the requirements of this Agreement; or
- (o) there has been a Manufacturer Serious Infringement under clause 33.4(b)(i).

30.2 **Persistent breach**

- (a) If the Manufacturer breaches any of its obligations (where those obligations are of the same type or nature) under this Agreement more than twice, then the Purchaser may serve a notice on the Manufacturer:
 - (i) specifying that it is a formal warning notice;
 - (ii) giving reasonable details of such breach;
 - (iii) requiring the production of a remedial plan ("**Remedial Plan**") acceptable to the Purchaser within 14 days of such notice, such Remedial Plan to include as a minimum:
 - (A) criteria for the success of the Remedial Plan;

- (B) time period for achievement of success;
 - (C) resources to be allocated to the Remedial Plan; and
 - (iv) stating that such breach is a breach which, if it continues unremedied or recurs within six (6) months of the date of service of the notice, or if the Manufacturer is in breach of the Remedial Plan, may result in a termination of this Agreement in accordance with this clause 30.2.
- (b) If, following service of a warning notice pursuant to clause 30.2(a), the breach(es) specified has continued unremedied or has recurred more than twice (which shall include breaches of the Remedial Plan) within the four (4) month period following the date of service of such notice, then the Purchaser may serve another notice on the Manufacturer:
- (i) specifying that it is a final warning notice;
 - (ii) stating that the breach specified has been the subject of the relevant warning notice served under clause 30.2(a) within the four (4) month period prior to the date of the final warning notice;
 - (iii) requiring a further Remedial Plan containing the information required by clause 30.2(a)(iii) (updated as appropriate); and
 - (iv) stating that if such failure continues unremedied or recurs (which shall include breaches of the Remedial Plan) more than twice within the six (6) month period commencing two (2) months after the date of service of the final warning notice, this Agreement may be terminated.
- (c) A warning notice may not be served in respect of any breach in respect of which a separate warning notice has already been served until a period of three (3) months has elapsed since the date of the previous warning notice.
- 30.3 The continuance of any failure to remedy specified in the final warning notice or any further breach of the same type or nature within the six (6) month period referred to in clause 30.2(b)(iv) shall constitute a **"Persistent Breach"** for the purposes of clause 30.1(d).
- 30.4 **Notification of a Manufacturer Event of Default**
- The Manufacturer shall notify the Purchaser promptly on the Manufacturer becoming aware of the occurrence of a Manufacturer Event of Default.
- 30.5 **Deemed Rectification of a Manufacturer Event of Default**
- Where a Manufacturer Event of Default listed in clause 30.1(f) has occurred and the relevant delayed Train is Accepted by the Purchaser before a Purchaser Termination Notice is issued to the Manufacturer, the relevant Manufacturer Event of Default shall be deemed to have been remedied upon the date of such Acceptance.
- 30.6 **Termination Notice for a Manufacturer Event of Default**
- If a Manufacturer Event of Default occurs and is continuing, the Purchaser may, if it wishes to terminate or Partially Terminate, as the case may be, the continued manufacture of the Purchased Items under this Agreement, deliver a notice in writing to the Manufacturer, signed on behalf of the Purchaser (**"Purchaser Termination Notice"**). The Purchaser Termination Notice shall specify the Manufacturer Event of Default in question, giving reasonable details (including, in the case of Partial Termination, the

Purchaser's determination of the reduction in the Total Contract Price following such Partial Termination), and either:

- (a) in the case of a Manufacturer Event of Default under any of clauses 30.1(a), (b) and (d) to (o) and (in the case of a Manufacturer Event of Default under any of clauses 30.1(a), (d), (e), (f), (g), (h), (i), (j), (k), (l), (m), (n) and (o)), where the Purchaser has not elected for clause 30.6(b) to apply, that this Agreement is to terminate or Partially Terminate with effect from the date specified in the Purchaser Termination Notice; or
- (b) in the case of a Manufacturer Event of Default under clause 30.1(c) or, at the Purchaser's absolute discretion, in the case of any other Manufacturer Event of Default under any of clauses 30.1(a), (d), (e), (f), (g), (h), (i), (j), (k), (l), (m), (n) and (o) which is capable of remedy, that this Agreement will terminate or Partially Terminate, as the case may be, with effect from the date falling 60 days after the date of the Purchaser Termination Notice, unless:
 - (i) the Manufacturer puts forward a plan (a "**Rectification Plan**") acceptable to the Purchaser in its absolute discretion within 28 days of the date of service of the Purchaser Termination Notice, such Rectification Plan to specify the proposed actions in reasonable detail and the latest date by which it is proposed that those actions will be completed; and
 - (ii) the Manufacturer rectifies in accordance with the Rectification Plan the relevant Manufacturer Event of Default within 60 days of the date of service of the Purchaser Termination Notice or any other period agreed in accordance with clause 30.6(b)(i) (such periods to run concurrently with the 28-day period in clause 30.6(b)(i)).

30.7 **Rectification Plan**

Where the Purchaser serves a Purchaser Termination Notice in accordance with clause 30.6(b) and the Manufacturer either:

- (a) rectifies the Manufacturer Event of Default within 60 days of the date of service of the Purchaser Termination Notice; or
- (b) implements the Rectification Plan agreed by the Purchaser in accordance with its terms,

the Purchaser Termination Notice will be deemed to be revoked and this Agreement will continue.

30.8 **No Rectification**

Where the Purchaser serves a Purchaser Termination Notice in accordance with clause 30.6(b) and the Manufacturer fails either to:

- (i) rectify the Manufacturer Event of Default within 60 days of the date of service of the Purchaser Termination Notice; or
- (ii) implement the Rectification Plan agreed by the Purchaser in accordance with its terms,

this Agreement will terminate or Partially Terminate, as the case may be, on the date falling 60 days after the date of service of the Purchaser Termination Notice unless the Purchaser notifies the Manufacturer otherwise.

30.9 **Termination where Rectification not permitted**

Where the Purchaser serves a Purchaser Termination Notice in accordance with clause 30.6(a), this Agreement will terminate or Partially Terminate, as the case may be, on the date set out in that Purchaser Termination Notice.

31. **PURCHASER DEFAULT**

31.1 **Purchaser Event of Default**

A Purchaser Event of Default shall occur when:

- (a) the Purchaser fails to make payment of any sum(s) which are not in dispute and which either singly or in aggregate exceeds £2,000,000 (Indexed), when due and payable to the Manufacturer in accordance with this Agreement and which remains unpaid 30 days following a subsequent written demand for payment; or
- (b) an Insolvency Event occurs in relation to the Purchaser; or
- (c) the circumstances identified in clause 45.1(g) (Restriction on Change of Control) occur.

31.2 **Notification of a Purchaser Event of Default**

The Manufacturer and the Purchaser agree to notify each other of the occurrence of any Purchaser Event of Default as soon as they become aware of such occurrence.

31.3 **Procedures in relation to Termination for a Purchaser Event of Default**

- (a) On the occurrence of a Purchaser Event of Default, if the Manufacturer wishes to terminate or Partially Terminate this Agreement, the Manufacturer must serve a termination notice on the Purchaser (a "**Manufacturer Termination Notice**") within 60 days of becoming aware of such Purchaser Event of Default. The Manufacturer Termination Notice must specify and give reasonable details of the Purchaser Event of Default which has occurred.
- (b) This Agreement will terminate or Partially Terminate, as the case may be, on the day falling 30 days after the date the Purchaser receives the Manufacturer Termination Notice, unless the Purchaser rectifies the Purchaser Event of Default within 28 days of receipt of the Manufacturer Termination Notice, in which case the Manufacturer Termination Notice will be deemed to be revoked and this Agreement will continue.

32. **FORCE MAJEURE**

32.1 **Relief from obligations**

Neither Party shall:

- (a) be entitled to bring a claim for a breach by the other Party of an obligation under this Agreement (other than a payment obligation); or
- (b) incur any liability to the other Party for any losses or damages incurred by that other Party,

to the extent that a Force Majeure Event occurs and the other Party is prevented from performing that obligation in whole or in part by that Force Majeure Event or its consequences.

32.2 **Notification of Force Majeure**

If either Party becomes aware of a Force Majeure Event which has affected or is likely to affect its ability to perform its obligations under this Agreement (the "**FM Affected Party**") it shall, as soon as reasonably practicable and in any event no more than five (5) Working Days after the start of the claimed Force Majeure Event serve notice in writing upon the other Party:

- (a) specifying the act, event or circumstance relied on as a Force Majeure Event;
- (b) detailing why the Force Majeure Event will prevent it performing its obligations; and
- (c) setting out its proposals to mitigate the consequences of the Force Majeure Event in accordance with clause 32.5.

32.3 As soon as practicable and no later than three (3) Working Days following a notification under clause 32.2, the Parties shall consult with each other in good faith and use all reasonable endeavours to agree appropriate terms to mitigate the consequences of any Force Majeure Event and to facilitate the continued performance of this Agreement.

32.4 The FM Affected Party shall provide periodic written updates (on at least a weekly basis or such other period as the Parties may agree acting reasonably) to the other Party of the effects of, and any proposals to mitigate the effect of the claimed Force Majeure Event, including any reasonable alternative means for performance of the affected obligations; and shall provide any information relating to the claimed Force Majeure Event and its effects that the other Party may reasonably request.

32.5 **Mitigation of Force Majeure**

- (a) The FM Affected Party shall at all times following the occurrence of a Force Majeure Event use all reasonable endeavours to prevent and mitigate the effects of the claimed Force Majeure Event (including, in the case of the Manufacturer, taking all steps in accordance with Good Industry Practice to overcome or minimise the effects of the Force Majeure Event and complying with the requests of the Purchaser Contract Manager) and to continue to perform its obligations under this Agreement and to resume performance as soon as possible.
- (b) The FM Affected Party shall not be relieved from liability under this Agreement to the extent that it is not able to perform its obligations under this Agreement due to its failure to comply with its obligations under clause 32.5(a) above.

32.6 **Termination for Force Majeure**

If there is no agreement as to the mitigation terms to adopt pursuant to clause 32.3 on or before the date falling 180 days after the date of commencement of the Force Majeure Event and such Force Majeure Event (or its consequences) is continuing or its consequences remain such that the FM Affected Party is unable to comply with its material obligations under this Agreement for that period of 180 days, either Party may give notice to terminate this Agreement to the other Party in whole or in part and the provisions of clause 33 (Force Majeure Termination/Declaration of Ineffectiveness) shall apply.

32.7 **Cessation of Force Majeure**

As soon as practicable after a Force Majeure Event ceases or no longer causes the FM Affected Party to be unable to comply with its obligations under this Agreement, the FM Affected Party shall notify the other Party in writing of such occurrence and shall resume performance of its obligations under this Agreement in so far as this Agreement has not been terminated (in whole or in part) in accordance with clause 32.6.

33. **FORCE MAJEURE TERMINATION / DECLARATION OF INEFFECTIVENESS**

33.1 **Notice of termination**

- (a) If the Purchaser serves a notice to terminate on the Manufacturer pursuant to clause 32.6 then this Agreement shall terminate on the date set out in that notice.
- (b) If the Manufacturer serves a notice to terminate on the Purchaser under clause 32.6, then the Purchaser has the option either to accept such notice (in which case this Agreement shall terminate on the date set out in that notice) or to respond in writing on or before the date falling ten (10) Working Days after the date of its receipt stating that it requires this Agreement to continue (a **"Continuation Notice"**).
- (c) If the Purchaser gives the Manufacturer a Continuation Notice then this Agreement will not terminate pursuant to the Manufacturer's notice under clause 32.6 but will terminate or Partially Terminate, as the case may be, on the earliest to occur of:
 - (i) expiry of written notice (of at least 28 days) from the Purchaser to the Manufacturer served at any time while the Force Majeure Event (or its consequences) is continuing stating that the Purchaser wishes this Agreement to terminate;
 - (ii) the second anniversary of the occurrence of the relevant Force Majeure Event provided such Force Majeure Event (or its consequences) is continuing as at such date; and
 - (iii) this Agreement being terminated in accordance with any other provisions of this Agreement.
- (d) If, during the currency of any Continuation Notice, termination occurs pursuant to clause 33.1(c)(iii) as a result of a Manufacturer Default, then the Purchaser shall pay the Manufacturer the applicable amount set out in schedule 20 (Termination Payments).

33.2 **Deemed notice**

If the Purchaser fails to respond to the notice given by the Manufacturer pursuant to clause 33.1(b) within the specified ten (10) Working Day period then the Purchaser shall be deemed to have served notice requiring this Agreement to continue.

33.3 **Declaration of Ineffectiveness**

- (a) In the event that a third party starts proceedings seeking a Declaration of Ineffectiveness and, as a result of such proceedings, a relevant court declares that this Agreement is Ineffective, then this Agreement will terminate or Partially Terminate, as the case may be, with immediate effect.
- (b) Where the Purchaser is served with any third party proceedings in relation to the subject matter of this clause 33.3, the Purchaser undertakes to serve a notice on the Manufacturer forthwith to keep the Manufacturer informed of the progress of said proceedings, including in relation to any determination or order of the nature described in clause 33.3(a).

33.4 **Utilities Contracts Regulations**

- (a) **Substantial Modification**

If there is an order of a court of competent jurisdiction, which is binding on the Purchaser, that this Agreement has been subject to a substantial modification which would have required a new procurement procedure pursuant to Regulation 89(1)(a) of the Utilities Contracts Regulations (a **"Substantial Modification"**), the Purchaser shall be entitled, in its absolute discretion, to terminate this Agreement on giving reasonable notice to the Manufacturer.

(b) **Serious Infringement**

- (i) If this Agreement should not have been awarded to the Manufacturer in view of a serious infringement by the Manufacturer of the obligations referred to in Regulation 89(1)(c) of the Utilities Contracts Regulations (a **"Manufacturer Serious Infringement"**), it shall constitute a Manufacturer Event of Default.
- (ii) If this Agreement should not have been awarded to the Manufacturer in view of a serious infringement by the Purchaser of the obligations referred to in Regulation 89(1)(c) of the Utilities Contracts Regulations (a **"Purchaser Serious Infringement"**), the Purchaser shall be entitled, in its absolute discretion, to terminate this Agreement on giving reasonable notice to the Manufacturer.

34. **PROHIBITED ACT AND SAFETY BREACH TERMINATION**

Prohibited Act

- 34.1 The Manufacturer shall notify the Purchaser promptly on the Manufacturer becoming aware of the occurrence of a Prohibited Act.
- 34.2 If the Manufacturer or any Subcontractor (or anyone employed by or acting on behalf of or associated with any of them or any of its or their agents or shareholders) commits any Prohibited Act, then the Purchaser may deliver a notice in writing to the Manufacturer, signed on behalf of the Purchaser (**"Prohibited Act Notice"**) and the Purchaser shall be entitled to act in accordance with clauses 34.4 to 34.8.
- 34.3 For the purposes of clauses 34.1 to 34.10, whether a person is associated with the Manufacturer or any of its Subcontractors shall be determined in accordance with section 8 of the Bribery Act 2010.

Party committing the Prohibited Act

- 34.4 If a Prohibited Act is committed by the Manufacturer (including any of its officers) or by an employee not acting independently of the Manufacturer, then the Purchaser may terminate this Agreement by giving notice to the Manufacturer, provided that, if the Prohibited Act is an offence under section 7(1) of the Bribery Act 2010, the Purchaser may only terminate this Agreement if, acting reasonably, it considers termination of this Agreement to be in the best interests of the Project.
- 34.5 If the Prohibited Act is committed by an employee of the Manufacturer acting independently of the Manufacturer, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate, unless within 28 days of receipt of such notice the Manufacturer terminates the employee's employment and (if necessary) procures performance of the relevant activities by another person.
- 34.6 If the Prohibited Act is committed by a Subcontractor (including any of its officers) or by an employee of that Subcontractor not acting independently of that Subcontractor, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate, unless within 28 days of receipt of such notice the Manufacturer terminates the relevant Subcontract (providing the Purchaser with

appropriate evidence) and, in accordance with clause 43.1 (Subcontracting), procures the performance of such part of the Project by another person provided that, if the Prohibited Act is an offence under section 7(1) of the Bribery Act 2010, the Purchaser may only terminate this Agreement if, acting reasonably, it considers termination of this Agreement to be in the best interests of the Project.

34.7 If the Prohibited Act is committed by an employee of a Subcontractor acting independently of that Subcontractor, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate, unless within 28 days of receipt of such notice the Subcontractor terminates the employee's employment and (if necessary) procures performance of the relevant activities by another person.

34.8 If the Prohibited Act is committed by another person not specified in clauses 34.4 to 34.7, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate unless within 28 days of receipt of such notice, the Manufacturer procures the termination of such person's involvement (and of the involvement of his employee) and (if necessary and in accordance with clause 43.1 (Subcontracting)) procures performance of the relevant activities by another person provided that, if the Prohibited Act is an offence under section 7(2) of the Bribery Act 2010, the Purchaser may only terminate this Agreement if, acting reasonably, it considers termination of this Agreement to be in the best interests of the Project.

34.9 The Manufacturer undertakes to the Purchaser that it will throughout the duration of this Agreement have in place adequate procedures (as referred to in section 7(2) of the Bribery Act 2010) designed to prevent persons associated with the Manufacturer from bribing any person with the intention of obtaining or retaining business for the Manufacturer or with the intention of obtaining or retaining an advantage in the conduct of business for the Manufacturer.

34.10 Termination notice for Prohibited Act

(a) Any notice of termination under clauses 34.1 to 34.9 shall specify:

- (i) the nature of the Prohibited Act;
- (ii) the identity of the party whom the Purchaser believes has committed the Prohibited Act; and
- (iii) the date on which this Agreement will terminate in accordance with the applicable provisions of clause 34.1 to this clause 34.10.

(b) In any case, where a Prohibited Act has been committed, and the Purchaser elects not to terminate this Agreement in accordance with this clause 34.10 (without prejudice to the Purchaser's right to terminate this Agreement at a later stage as a result of such Prohibited Act), the Purchaser may require that:

- (i) the Manufacturer puts forward a rectification plan acceptable to the Purchaser in its absolute discretion within 28 days of the date of service of the Prohibited Act Notice, such rectification plan to specify the proposed actions in reasonable detail and the latest date by which it is proposed that those actions will be completed; and
- (ii) the Manufacturer rectifies in accordance with the rectification plan the relevant Prohibited Act within 60 days of the date of service of the Prohibited Act Notice or any other period agreed in accordance with paragraph (i) above (such periods to run concurrently with the 28-day period in paragraph (i)).

- (c) Nothing in clauses 34.1 to 34.10 shall prevent the Purchaser from exercising its discretion to terminate this Agreement for a Prohibited Act that falls within limb (e) of the definition of Prohibited Act where it is required to do so by the Utilities Contracts Regulations.

Safety Breach

- 34.11 The Manufacturer shall notify the Purchaser promptly on the Manufacturer becoming aware of the occurrence of a Safety Breach.
- 34.12 If the Manufacturer or any Subcontractor commits any Safety Breach, then the Purchaser may deliver a notice in writing to the Manufacturer, signed on behalf of the Purchaser (a "**Safety Breach Notice**") and the Purchaser shall be entitled to act in accordance with clauses 34.13 to 34.17.

Party committing the Safety Breach

- 34.13 If a Safety Breach is committed by the Manufacturer (including any of its officers) or by an employee not acting independently of the Manufacturer, then the Purchaser may terminate this Agreement by giving notice to the Manufacturer.
- 34.14 If the Safety Breach is committed by an employee of the Manufacturer acting independently of the Manufacturer, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate, unless within 28 days of receipt of such notice the Manufacturer terminates the employee's employment and (if necessary and in accordance with clause 43.1 (Subcontracting)) procures performance of the relevant activities by another person.
- 34.15 If the Safety Breach is committed by a Subcontractor (including any of its officers) or by an employee of that Subcontractor not acting independently of that Subcontractor, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate, unless within 28 days of receipt of such notice the Manufacturer terminates the relevant Subcontract (providing the Purchaser with appropriate evidence) and, in accordance with clause 43.1 (Subcontracting), procures the performance of such part of the Project by another person.
- 34.16 If the Safety Breach is committed by an employee of a Subcontractor acting independently of that Subcontractor, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate, unless within 28 days of receipt of such notice the Subcontractor terminates the employee's employment and (if necessary and in accordance with clause 43.1 (Subcontracting)) procures performance of the relevant activities by another person.
- 34.17 If the Safety Breach is committed by another person not specified in clauses 34.13 to 34.16, then the Purchaser may give notice of termination of this Agreement to the Manufacturer and this Agreement will terminate unless within 28 days of receipt of such notice, the Manufacturer procures the termination of such person's involvement (and of the involvement of his employee) and (if necessary and in accordance with clause 43.1 (Subcontracting)) procures performance of the relevant activities by another person.

34.18 Termination notice for Safety Breach

Any notice of termination under clauses 34.11 to 34.17 shall specify:

- (a) the nature of the Safety Breach;
- (b) the identity of the party whom the Purchaser believes has committed the Safety Breach; and

- (c) the date on which this Agreement will terminate, in accordance with the applicable provisions of clause 34.11 to this clause 34.18.

In any case, where a Safety Breach has been committed, and the Purchaser elects not to terminate this Agreement in accordance with this clause 34.18 (without prejudice to the Purchaser's right to terminate this Agreement at a later stage as a result of such Safety Breach), the Purchaser may require that:

- (i) the Manufacturer puts forward a rectification plan acceptable to the Purchaser in its absolute discretion within 28 days of the date of service of the Safety Breach Notice, such rectification plan to specify the proposed actions in reasonable detail and the latest date by which it is proposed that those actions will be completed; and
- (ii) the Manufacturer rectifies in accordance with the rectification plan the relevant Safety Breach within 60 days of the date of service of the Safety Breach Notice or any other period agreed in accordance with paragraph (i) (such periods to run concurrently with the 28-day period in paragraph (i)).

35. CONSEQUENCES OF TERMINATION

35.1 Payment

If this Agreement is terminated:

- (a) as a result of a Manufacturer Event of Default in accordance with clause 30 (Manufacturer Default), paragraph 1 and paragraph 2 of schedule 20 (Termination Payments) shall apply;
- (b) as a result of a Purchaser Event of Default in accordance with clause 31 (Purchaser Default), voluntarily by the Purchaser pursuant to clause 36.1 or as a result of a Purchaser Serious Infringement as referred to in clause 33.4(b)(ii), paragraph 3 of schedule 20 (Termination Payments) shall apply;
- (c) as a result of a Force Majeure Event pursuant to clause 32.6 (Termination for Force Majeure), paragraph 3 (Consequences of Voluntary Termination or Termination for Purchaser Default/Force Majeure) of schedule 20 (Termination Payments) shall apply;
- (d) as a result of a Prohibited Act or Safety Breach pursuant to clause 34 (Prohibited Act and Safety Breach Termination), paragraph 1 and paragraph 2 of schedule 20 (Termination Payments) shall apply;
- (e) as a result of Ineffectiveness under clause 33, paragraph 4 of schedule 20 (Termination Payments) shall apply,

and for each of paragraphs (a) to (e) paragraphs 5 and 6 of schedule 20 (Termination Payments) shall (to the extent applicable) apply, in each case to determine the amounts payable by one Party to the other in relation to such termination of this Agreement.

35.2 Title in the Trains and Equipment

Upon termination of this Agreement, title in the Trains and Equipment shall transfer, if applicable, in accordance with schedule 20 (Termination Payments).

35.3 Termination and Change

Any termination of this Agreement shall only have effect with regard to any Trains and other Equipment which both (i) have not been Accepted, and (ii) are not otherwise to be

delivered to the Purchaser upon or following such termination in accordance with this Agreement. Accordingly, upon any such termination, subject to any express provision in this Agreement to the contrary, this Agreement and the rights and obligations of the Parties hereunder shall continue in relation to all Trains and other Equipment in relation to which the Works are not so terminated.

35.4 Assignment of warranties and guarantees

- (a) The Manufacturer shall procure that all warranties and guarantees in respect of the Works, Trains or Equipment that remain in force at the date of termination of this Agreement are capable of assignment and shall, upon any termination of this Agreement, upon the written request of the Purchaser, assign to the Purchaser or its nominee the benefit free from any Security Interest of any or all such warranties and guarantees in relation to any Trains or Equipment to which the Purchaser retains or will acquire title upon or following such termination in accordance with the terms of this Agreement.
- (b) Where this Agreement has been terminated or, if earlier, there is, in the Purchaser's reasonable opinion, a realistic prospect of this Agreement being terminated on the occurrence of an Event of Default, the Purchaser shall be entitled to require the Manufacturer to provide all drawings of all Parts and/or Major Components, all design, technical and maintenance records relating to the Purchased Items including all Manuals relating to the Purchased Items for operating the Purchased Items in Unrestricted Passenger Revenue Earning Service to the extent the same have not been provided in accordance with this Agreement and such information shall be treated as Manufacturer IPR for the purposes of this Agreement.

35.5 Handover of documentation

The Manufacturer shall ensure that:

- (a) all Technical Documents to which the Purchaser retains or will acquire title upon or following the relevant termination of this Agreement and the rights to use and copy such documentation; and
- (b) the Technical Library and the rights to use and copy any documentation comprising the Technical Library,

in each case required to use the Trains and Equipment for all purposes contemplated under this Agreement (including clause 29.3, clause 29.4 and clause 29.5) and the FSA, shall be up to date, accurate and complete and, to the extent the same have not otherwise been provided in accordance with this Agreement and if the Purchaser so requires, handed over to the Purchaser upon termination of this Agreement.

Saving Provisions

- 35.6 Any termination of this Agreement shall be without prejudice to any right or remedy of either Party against the other accruing or accrued prior to such termination including any right to claim damages for any antecedent breach of this Agreement and/or in respect of those clauses referred to in clause 35.10 occurring after termination and any right to claim damages or other relief in relation thereto but subject, in the case of the Manufacturer, to clause 35.1.
- 35.7 The rights of the Purchaser in respect of termination are in addition and without prejudice to any right which the Purchaser may have to obtain redress or relief available at Law (whether by way of damages, specific performance or otherwise) in respect of a Manufacturer Default provided that the Purchaser shall not be entitled to recover twice in respect of the same loss.

35.8 Save as set out in this clause 35 and in schedule 20 (Termination Payments) or as otherwise expressly stated in this Agreement, the Manufacturer shall not be entitled to any payment or any other remedy as a consequence of termination of this Agreement.

35.9 Neither Party shall be entitled to terminate this Agreement except as expressly set out in this Agreement.

35.10 Survival

Upon termination or expiry of this Agreement, whether in respect of any one Purchased Item or all Purchased Items, the obligations of the Parties under this Agreement in respect of the terminated Purchased Item shall cease except for:

- (a) any rights and obligations arising as a result of any antecedent breach of this Agreement or any rights and obligations which shall have accrued or become due prior to the date of termination; and
- (b) the provisions of the following clauses shall remain in full force and effect notwithstanding the expiry or termination of this Agreement: 1 (Definitions and Interpretation), 3 (Representations and Warranties), 9.3 to 9.8, 20 (Warranties), 22 (Manufacturing Tooling), 25 (Payments and VAT), 26 (Guarantee), 28 (Change in Law), 29 (Intellectual Property Rights), 30 (Manufacturer Default), 31 (Purchaser Default), 32 (Force Majeure), 33 (Force Majeure Termination/Declaration of Ineffectiveness), 34 (Prohibited Act and Safety Breach Termination), 35 (Consequences of Termination), 36.1, 37 (Indemnities and Limitations on Liability), 38 (Confidentiality), 39 (Freedom of Information), 40 (Dispute Resolution), 42 (Safety, Quality and Environmental Plan), 43 (Assignment, Transfer and Sub Contracting by the Manufacturer), 47 (Notices) to 62 (Governing Law and Jurisdiction) and the related clauses and schedules (including schedule 20 (Termination Payments)) required to give effect to those clauses in relation to such termination or the consequences of such termination.

35.11 Co-operation on termination

Without prejudice to the rest of this clause 35, the Manufacturer shall, following termination of this Agreement, co-operate generally with the Purchaser in relation to the consequences of such termination including:

- (a) ensuring the continuity of performance of and an orderly handover of control of the Works (including the return to the Purchaser by the Manufacturer of any Test Track Facilities Integration Equipment, and any Pre-Specified Free Issue Materials and Free Issue Materials);
- (b) taking such steps as may be reasonably requested by the Purchaser in connection therewith;
- (c) making appropriately skilled and qualified employees of the Manufacturer and any Subcontractors reasonably available to provide assistance and advice and attend such meetings with the Purchaser, members of the TfL Group and other relevant third parties (including any train manufacturer appointed to complete any of the Works that remained unperformed at the time of termination) as are reasonably required in order to determine those actions that are required in order to facilitate such continuity and orderly handover;
- (d) continuing to grant the Purchaser and PDPs access to the Test Track Facilities to the extent required to complete any Test that has commenced before termination but has not been completed;

- (e) providing such records and information relating to or connected with the Works as the Purchaser may reasonably require; and
- (f) delivering the TCMS Simulator to the Purchaser at such a location as the Purchaser may specify with reasonable notice, in a state which represents and is consistent with the modification status of the Trains in passenger service and accompanied by installation, operation and maintenance manuals.

36. **VOLUNTARY TERMINATION OR SUSPENSION BY THE PURCHASER**

36.1 **Voluntary Termination by the Purchaser**

- (a) The Purchaser shall have the right, at its absolute discretion, to terminate or Partially Terminate this Agreement at any time during the term of this Agreement provided that the Purchaser complies with its obligations under this clause 36.1.
- (b) If the Purchaser wishes to terminate or Partially Terminate this Agreement under this clause 36.1, it must give notice to the Manufacturer stating that:
 - (i) the Purchaser is terminating or Partially Terminating this Agreement under this clause 36.1; and
 - (ii) this Agreement will terminate or Partially Terminate on the date stated in the notice falling no earlier than 12 months after the date of such notice; and
 - (iii) in the case of Partial Termination of a Fleet or Fleets, the manner in which such Partial Termination is to take effect and which elements of the Manufacturer's obligations under this Agreement are to be terminated (and the remaining obligations shall continue regardless of any such Partial Termination),

except that, if the Purchaser wishes to terminate or Partially Terminate this Agreement under this clause 36.1 at any time prior to the Commencement Date, notwithstanding clause 36.1(b)(ii), the Purchaser shall not be required to give a minimum period of notice and this Agreement will terminate or Partially Terminate on the date stated in the notice.

- (c) This Agreement will terminate or Partially Terminate on the date set out in the notice referred to in clause 36.1(b) above and clause 35.1(b) shall apply.
- (d) The non-exercise by the Purchaser of any Whole Line Option shall not be taken to mean or imply an exercise by the Purchaser of any right to terminate or Partially Terminate this Agreement voluntarily under this clause 36.1.

36.2 **Suspension by the Purchaser**

- (a) The Purchaser shall have the right to suspend this Agreement in whole or in part at any time on or prior to the Holdpoint Date in the circumstances set out in clause 36.2(b) by issuing a notice ("**Suspension Notice**") to the Manufacturer and the rest of this clause 36.2 shall apply. For the avoidance of doubt, the Purchaser shall have the right to issue a Suspension Notice regardless of whether the Purchaser has issued a Suspension Consideration Notice.
- (b) The Purchaser may issue a Suspension Notice where there is delay in the placing of a contract for the signalling elements of the DTUP.
- (c) The Suspension Notice shall state:

- (i) that the Purchaser is suspending this Agreement in whole or in part;
- (ii) the date on which the suspension shall come into effect which shall be at least one (1) month after the date of the Suspension Notice; and
- (iii) where there is to be a partial suspension, the manner in which such suspension is to take effect and which elements of the Manufacturer's obligations under this Agreement are to be suspended (and the remaining obligations shall continue regardless of any such suspension),

and this Agreement will be suspended or partially suspended on the date set out in the Suspension Notice.

(d)

- (i) The Purchaser may notify the Manufacturer at any time that it is considering issuing a Suspension Notice ("**Suspension Consideration Notice**") indicating the time or times at which the Purchaser is considering issuing a Suspension Notice. Within 10 Working Days of a Suspension Consideration Notice, the Manufacturer shall provide to the Purchaser details of the anticipated consequences of the Purchaser issuing a Suspension Notice at the time proposed in the Suspension Consideration Notice and in doing so shall comply with the provisions of Part D: (Compensation Changes) of schedule 12 (Change Procedure).
- (ii) The Manufacturer will, in responding to any Suspension Consideration Notice, mitigate in so far as is reasonably possible, all potential delays which could be caused to the Key Programme Dates and any additional impact on the Project and the obligations in this Agreement, so as to reduce as far as is reasonably possible, the impact of the Purchaser issuing a Suspension Notice.

(e) Following the issue of a Suspension Notice:

- (i) the Manufacturer shall suspend work on the suspended elements as set out in the Suspension Notice;
- (ii) subject to clause 36.2(e)(iii), the Purchaser will extend certain of the Piccadilly Line Key Programme Dates to reflect such a suspension and resulting delay; and
- (iii) as requested by the Purchaser, the Manufacturer will work with the Purchaser to mitigate all delays caused to the Key Programme Dates and any additional impact on the Project and the obligations in this Agreement including any additional costs of the Manufacturer.

(f) Following the issue of a Suspension Notice, the Purchaser shall be entitled at any time to cancel any such suspension or partial suspension by issuing a restart notice ("**Restart Notice**") to the Manufacturer, in which case the Manufacturer shall restart any suspended obligations with effect from the date stated in, and on the basis set out in, the Restart Notice.

(g) The issue of a Suspension Notice by the Purchaser shall constitute a Compensation Event on the basis that where the Purchaser has notified the Manufacturer of its intention to issue a Suspension Notice in accordance with clause 36.2(d)(i), any associated Manufacturer Compensation Proposal shall be limited in scope and cost to being no greater than that provided in response to the Suspension Consideration Notice in accordance with clause 36.2(d).

37. INDEMNITIES AND LIMITATIONS ON LIABILITY

37.1 Indemnity by Manufacturer

- (a) The Manufacturer shall, subject to clause 37.1(c), be responsible for, and shall release and indemnify the Indemnified Parties on demand on an after-Tax basis from and against all liability for:

- (i) death or personal injury;
- (ii) loss or damage to property;
- (iii) breach of statutory duty; and
- (iv) third party actions, claims, demands, costs, charges and expenses (including legal expenses on an indemnity basis) brought against any Indemnified Party,

which may arise out of, or in consequence of:

- (A) the design, construction, manufacture testing, commissioning or testing of the Trains, the Equipment and/or any Subsystem, Part or Major Component forming part of any Train);
- (B) the operation and use of the Trains or the Equipment, to the extent that the Purchaser operates and maintains such Trains or Equipment in accordance with the Permitted Use;
- (C) the performance or non-performance by the Manufacturer, a Subcontractor of the Manufacturer or its or their respective servants, employees or agents, of the Manufacturer's obligations under the Project Documents; or
- (D) the presence on the Relevant Property of the Manufacturer, a Subcontractor of the Manufacturer or its or their respective servants, employees or agents, in each case in connection with the Project Documents.

- (b) The Manufacturer shall, subject to clause 37.1(c), be responsible for and shall release and indemnify the Indemnified Parties on demand on an after-Tax basis from and against all Losses whatsoever suffered or incurred by the Indemnified Parties as a result of:

- (i) the negligence or wilful misconduct of; or
- (ii) breach of any Project Documents by,

the Manufacturer, any Subcontractor, the Guarantor or its or their respective servants, Affiliates, employees or agents (including any such Losses arising on a termination of this Agreement).

- (c) The Manufacturer shall not be responsible or be obliged to indemnify the Indemnified Parties:

- (i) pursuant to clauses 37.1(a) or 37.1(b) for any of the matters referred to in clauses 37.1(a)(i) to 37.1(a)(iv) or 37.1(b) which arises as a direct result of the Manufacturer acting in accordance with an instruction in writing given by the Purchaser as part of a Change, provided that the Manufacturer objected in writing to the giving of the instruction prior to its implementation and

such objection was considered by the Purchaser to be reasonable or (in the case of disagreement) the objection is determined, pursuant to the Dispute Resolution Procedure, to be reasonable;

- (ii) for any liability or Losses to the extent that the relevant liability or Loss is of such nature as is intended to be compensated by the payment of liquidated damages pursuant to this Agreement;
- (iii) pursuant to clause 37.1(a) or 37.1(b), for any liability or Losses caused by the negligence or wilful misconduct of any of the Indemnified Parties or by the breach by the Purchaser of its obligations under this Agreement;
- (iv) for any Uninsured Losses incurred in excess of £30 million (Indexed) in aggregate; or
- (v) for any loss of revenue suffered by any of the Indemnified Parties, save in respect of any IPR claims which a party may become aware of which might give rise to liability for the other under clause 29.8,

except to the extent that such Losses are recoverable (or should be recoverable assuming the Required Insurances have been taken out and maintained in force in accordance with this Agreement) under the Required Insurances and any other insurances required pursuant to paragraph 1.2 of schedule 13 (Insurance) to be taken out by the Manufacturer in accordance with clause 19 (Insurance) and schedule 13 (Insurance).

37.2 **No Double Recovery**

An indemnity by either Party under any provision of this Agreement shall be without limitation to any indemnity by that Party under any other provision of this Agreement or the FSA provided that nothing in this Agreement shall give either Party the right to any double recovery. In addition and for the avoidance of doubt, liability under any indemnity or other liability in this Agreement or the FSA other than this clause 37 shall be disregarded in determining any limitation on liability under this clause 37.

37.3 **Mitigation**

Each Indemnified Party shall at all times take all reasonable steps to minimise and mitigate any injury or Loss for which it is entitled to bring a claim against the Indemnifying Party pursuant to this Agreement.

37.4 **Resistance of claims**

- (a) If one Party (the "**Recipient**") becomes aware of any third party claim against the Recipient which may result in a claim by the Recipient against the other Party under any of the indemnities contained in this Agreement, the Recipient shall give notice to the Indemnifying Party as soon as is reasonably practicable thereafter. The Indemnifying Party shall be entitled at its discretion (but after consultation with the Recipient) to resist at the Indemnifying Party's own expense such claim on behalf of the Recipient provided that:
 - (i) the Recipient shall be kept fully informed of all matters pertaining to the claim;
 - (ii) the Indemnifying Party shall, in resisting any such claim, comply with the terms of any relevant policies of insurance issued pursuant to clause 19 (Insurance) and schedule 13 (Insurance);

- (iii) the Indemnifying Party shall not be entitled to resist any such claim before any court unless it has been advised by leading counsel, after disclosure of all relevant information and documents, that it is reasonable to resist such claim in the manner proposed by the Indemnifying Party; and
 - (iv) the Recipient is indemnified and secured to its reasonable satisfaction by the Indemnifying Party against all Losses which may thereby be incurred.
- (b) The Recipient shall give the Indemnifying Party and the insurer, if any, under a policy of insurance issued pursuant to clause 19 (Insurance) and schedule 13 (Insurance) all reasonable co-operation, access and assistance, technical or otherwise for the purpose of resisting such a claim, subject as provided in clause 37.4(a)(iv).
- (c) If the Indemnifying Party does not request the Recipient to take any appropriate action or shall fail to indemnify and secure the Recipient to its reasonable satisfaction within 15 Working Days of the said notice to the Indemnifying Party, the Recipient shall be free to pay or settle the claim on such terms as it may in its absolute discretion think fit. The Recipient shall make no admission prejudicial to the resistance of such claim prior to the expiry of the notice period and then only if the Indemnifying Party has either:
 - (i) not requested the Recipient to take any appropriate action; or
 - (ii) not indemnified and secured the Recipient to its reasonable satisfaction or within 15 Working Days of such notice to the Indemnifying Party.

Limitation on Manufacturer's liability

- 37.5 Subject to clause 37.6, the Manufacturer's liability to the Indemnified Parties under this Agreement (whether arising by way of indemnity, in contract, tort (including negligence), breach of statutory duty or otherwise and including the Acceptance Liquidated Damages), shall not exceed an aggregate amount equal to 30 per cent of the Total Contract Price from time to time (the "**Maximum Liability**").
- 37.6 The following shall not contribute to the Maximum Liability (being the "**Excluded Liabilities**"):
- (a) any liability of the Manufacturer to the Indemnified Parties arising as a result of or in connection with:
 - (i) death or personal injury;
 - (ii) fraud, fraudulent misrepresentation or corruption by the Manufacturer or any member of the Manufacturer Group; or
 - (iii) wilful default or abandonment;
 - (b) any costs or expenses which the Manufacturer is obliged or does expend during the term of this Agreement in carrying out its obligations;
 - (c) any costs incurred in satisfying Pre-Provisional Preconditions or Preconditions;
 - (d) Losses suffered or incurred, to the extent such Loss is or is required to be insured by the Manufacturer in accordance with the provisions of clause 19 (Insurance);
 - (e) the Manufacturer's liability on termination or cancellation (in whole or in part) of this Agreement or otherwise to refund and pay to the Purchaser all Milestone Payments previously paid by the Purchaser in respect of any Trains or Equipment

which are the subject of a termination or cancellation in accordance with this Agreement (together with all interest payable on any such refund or payment), as such refund is calculated in accordance with schedule 20 (Termination Payments);

- (f) the Manufacturer's liability in respect of its express obligations in relation to warranty claims and/or for defect rectification pursuant to each of the Manufacturer's obligations under clause 20 (Warranties), including any related liquidated damages payments;
- (g) the Manufacturer's liability for any IPR claims pursuant to clauses 29.7 or 29.8;
- (h) (except to the extent already provided for under clause 37.6(e)) the Manufacturer's liability to refund or reimburse as expressly provided in this Agreement but for the avoidance of doubt excluding the Manufacturer's liability to indemnify in accordance with clause 37.6(g);
- (i) the Manufacturer's liability to pay any Taxes as expressly provided by this Agreement or as required by Applicable Laws and Standards;
- (j) any interest payable under this Agreement;
- (k) the cost to the Purchaser of taking out and paying premiums in relation to any relevant policies or contracts of insurance where the Manufacturer has failed to take out or maintain the Required Insurances pursuant to paragraph 13 of Part A: (Manufacturer's Obligations) of schedule 13 (Insurance);
- (l) any costs and expenses incurred by the Purchaser pursuant to clause 21.1 and recoverable from the Manufacturer under clause 21.2,

and no Excluded Liabilities shall be included in calculating any remaining amount of the Maximum Liability (and the Excluded Liabilities shall not contribute to using up the Maximum Liability).

37.7 Purchaser Indemnities

The Purchaser shall not be liable for the Manufacturer's loss of revenue under any indemnity or otherwise under this Agreement.

37.8 CAHA

- (a) The Manufacturer shall become a party to CAHA within two (2) months of the Commencement Date.
- (b) Clause 16 of CAHA (or any reiteration of the principles of such provision) shall not apply as between the Manufacturer on the one hand and the Indemnified Parties on the other in respect of matters relating to the subject matter of this Agreement.
- (c) Clause 17 of CAHA (or any reiteration of the principles of such provision) shall apply between the Manufacturer and the Indemnified Parties in respect of matters relating to the subject matter of this Agreement but only to the extent that the recovery of the relevant loss would not otherwise be recoverable under this Agreement.

37.9 Service Provider actions

Notwithstanding any other provision of this Agreement, the Manufacturer shall not be entitled to make any claim, or be entitled to any relief, under or relating to any provision of this Agreement to the extent that such claim or relief arises out of or is increased by any act or omission by the Service Provider under the FSA or otherwise.

37.10 **Survival**

This clause 37 shall survive the expiry or termination of this Agreement.

38. **CONFIDENTIALITY**

38.1 **Manufacturer's Obligations of Confidentiality**

Subject to clause 38.4 and except as otherwise provided in the Project Documents, the Manufacturer shall keep confidential all matters relating to this Agreement and the Project Documents and shall use all reasonable endeavours to prevent its employees, agents and Subcontractors from making any disclosure to any person of any matter relating to this Agreement and the Project Documents.

38.2 **Purchaser's Obligations of Confidentiality**

Subject to clause 38.4 and the rest of this clause 38.2, the Purchaser shall have the same obligations as those imposed on the Manufacturer under clause 38.1 in respect of those items of confidential and commercially sensitive information set out in schedule 18 (Manufacturer Confidential Information) until such time as is indicated in column 2 of the same table. Without prejudice to the foregoing and clause 38.4, the Purchaser shall be entitled to:

- (a) disclose Manufacturer Confidential Information where the Purchaser considers that it is obliged to do so under any Applicable Laws and Standards;
- (b) use Manufacturer Confidential Information to the extent necessary to obtain the benefit of the Manufacturer's performance under this Agreement;
- (c) disclose such Manufacturer Confidential Information as may be required to be published in the Official Journal of the European Union;
- (d) disclose such Manufacturer Confidential Information as may be required pursuant to a FOI Information Request or otherwise in accordance with clause 39; and
- (e) publish this Agreement, the FSA, the Escrow Agreement or any other document, contract or data relating to this Agreement to the general public which is required to be published pursuant to the requirements of the Transparency Commitment from time to time.

38.3 For the purposes of clause 38.2(e), the Purchaser may in its absolute discretion prior to publication:

- (a) redact all or part of this Agreement, the FSA, the Escrow Agreement or any other document, contract or data relating to this Agreement which is required to be published pursuant to the requirements of the Transparency Commitment, to take account of the exemptions that would be available in relation to information requested under the FOI Legislation; and
- (b) consult with the Manufacturer regarding any redactions to this Agreement, the FSA, the Escrow Agreement or any other document, contract or data relating to this Agreement which is required to be published pursuant to the requirements of the Transparency Commitment, to be published,

provided that in all cases the Purchaser shall make the final decision regarding publication and/or redaction of this Agreement, the FSA, the Escrow Agreement or any other document, contract or data relating to this Agreement which is required to be published pursuant to the requirements of the Transparency Commitment.

38.4 Permitted Disclosures

The Manufacturer's obligations of confidentiality in clause 38.1 and the Purchaser's obligations of confidentiality in clause 38.2 shall not apply to:

- (a) any disclosure of information that is reasonably required by persons engaged in the performance of obligations set out in this Agreement;
- (b) any matter which a Party can demonstrate is already generally available and in the public domain otherwise than as a result of a breach of this clause 38;
- (c) any disclosure to the Service Provider in connection with the Fleet Support Agreement;
- (d) any disclosure to enable a determination to be made under schedule 19 (Dispute Resolution Procedure);
- (e) any disclosure which is required by any Law (including any order of a court of competent jurisdiction), any Parliamentary obligation or the rules of any stock exchange or governmental or regulatory authority having the force of Law;
- (f) any disclosure of information which is already lawfully in the possession of the receiving party, prior to its disclosure by the disclosing party;
- (g) any provision of information where it is proposed that a person should or may provide funds (whether directly or indirectly and whether by loan, equity participation or otherwise) to the Purchaser to enable it to carry out its obligations under this Agreement, to that person but only to the extent reasonably necessary to enable a decision to be taken on the proposal;
- (h) any disclosure of information relating to the design, construction, operation and maintenance of the Trains and such other information (except pricing information) as may be reasonably required for the purpose of conducting a due diligence exercise to any proposed new contractor and its advisers, should the Purchaser decide to retender this Agreement;
- (i) any registration or recording of any consents and property registration required;
- (j) any disclosure of information by the Purchaser in accordance with clause 38.6;
- (k) any disclosure by the Purchaser of any document related to this Agreement to which it is a party and which the Manufacturer (acting reasonably) has agreed with the Purchaser contains no commercially sensitive information;
- (l) any disclosure for the purpose of:
 - (i) the examination and certification of the Purchaser's or the Manufacturer's accounts; or
 - (ii) any examination pursuant to section 6(1) of the National Audit Act 1983; and
- (m) any disclosure to the insurers of the Project.

38.5 Where disclosure is permitted under clause 38.4, other than sub-clauses 38.4(b), 38.4(e), 38.4(f), 38.4(i), 38.4(j) and 38.4(k), the discloser of such information shall procure that the recipient of the information shall be subject to the same obligations of confidentiality as those contained in this Agreement.

- 38.6 Nothing in this Agreement shall prevent the disclosure by the Purchaser of any Confidential Information to SoS, TfL or any other subsidiaries of TfL, the Mayor, the Purchaser's Subcontractors, all respective advisers or any other person or body that the Purchaser from time to time is required to consult with or provide information to. The Parties acknowledge that the National Audit Office has the right to publish details of this Agreement (including commercially sensitive information) in its relevant report to Parliament.
- 38.7 The Manufacturer shall not make use of this Agreement or any information issued or provided by or on behalf of the Manufacturer in connection with this Agreement otherwise than for the purpose of this Agreement and the FSA, except with the written consent of the Purchaser.
- 38.8 Where the Manufacturer, in carrying out its obligations under this Agreement, is provided with information relating to users of the Purchased Item, the Manufacturer shall not disclose or make use of any such information otherwise than for the purpose for which it was provided, unless the Manufacturer has obtained the prior written consent of both the user and the Purchaser.
- 38.9 **Restrictions on publicity and public relations**
- The Manufacturer shall not by itself, its employees or agents and shall procure that its Subcontractors shall not, communicate with representatives of the press, television, radio or other communications media on any matter concerning this Agreement, the FSA or any Purchased Item without the prior written approval of the Purchaser.
- 38.10 No facilities to photograph or film in or upon any property used in relation to the manufacture and delivery of the Trains or Equipment under this Agreement shall be given or permitted by the Manufacturer unless the Purchaser has given its prior written approval.
- 38.11 Notwithstanding any other provision of this Agreement, including clauses 19 (Insurance) and 37 (Indemnities and Limitations on Liability), the Manufacturer agrees that the Purchaser shall have the right to control and supervise all dealings with the media in respect of any incident, event, claim or action in relation to any part of the Purchased Item.
- 38.12 The Manufacturer shall co-operate with the Purchaser in relation to the Purchaser's publicity of any aspect relating to this Agreement, the FSA or any Purchased Item.
- 38.13 **Data protection**
- (a) The Manufacturer and Purchaser shall each comply with its respective obligations under the DP Legislation and neither Party shall do any act that, or omit to do any act the omission of which, puts the other in breach of such obligations. The Parties acknowledge that the Purchaser alone shall determine the purposes for which and the manner in which Personal Data is, or is to be Processed in the performance of the Services and that accordingly:
- (i) the Purchaser shall be the **"data controller"** (as defined in the European DP Legislation) in respect of all Personal Data; and
- (ii) the Manufacturer shall be the **"data processor"** (as defined in the European DP Legislation) in respect of Personal Data.
- (b) When Processing any Personal Data the Manufacturer shall:
- (i) exercise all reasonable care, skill and diligence;

- (ii) only act in accordance with documented instructions from the Purchaser regarding Processing of Personal Data on behalf of the Purchaser pursuant to this Agreement;
 - (iii) taking into account the nature of the Processing, assist the Purchaser by taking appropriate technical and organisational measures for the fulfilment of the Purchaser's obligations to respond to requests for exercising the rights of Data Subjects;
 - (iv) taking into account the nature of the Processing and the information available to the Manufacturer, assist the Purchaser in ensuring compliance with its obligations under the DP Legislation;
 - (v) make available all information to the Purchaser necessary to demonstrate compliance with the Manufacturer's obligations in the DP Legislation, and allow for and contribute to audits, including inspections, conducted by the Purchaser or another auditor mandated by the Purchaser;
 - (vi) maintain a valid and up-to-date registration or notification under the DP Legislation covering the Processing to be performed in connection with this Agreement; and
 - (vii) shall immediately inform the Purchaser if, in its opinion, any instruction provided by the Purchaser in relation to Processing Personal Data is in breach of DP Legislation or European DP Legislation.
- (c) Security of Processing
- (i) The Manufacturer shall, taking into account the state of the art, the costs of implementation and the nature, scope, context and purposes of the Processing as well as the risk of varying likelihood and severity for the rights and freedoms of the Data Subjects, implement and maintain at all times appropriate technical and organisational measures to ensure a level of security appropriate to the risk of Processing of the Personal Data, including, as appropriate:
 - (A) taking measures against unauthorised or unlawful Processing of the Personal Data and against accidental loss or destruction of or damage to the Personal Data in accordance with the DP Legislation (and at the request of the Purchaser shall provide details of all such measures);
 - (B) the pseudonymisation and encryption of Personal Data;
 - (C) the ability to ensure the ongoing confidentiality, integrity, availability and resilience of Processing systems and services;
 - (D) the ability to restore the availability and access to Personal Data in a timely manner in the event of a physical or technical incident;
 - (E) a process for regularly testing, assessing and evaluating the effectiveness of technical and organisational measures for ensuring the security of the Processing.
 - (ii) In assessing the appropriate level of security the Manufacturer shall take account of the risks that are presented by the Processing of Personal Data, in particular from accidental or unlawful destruction, loss, alteration, unauthorised disclosure of, or access to Personal Data transmitted, stored or otherwise Processed.

- (iii) Such technical and organisational security measures shall be consistent with those measures used by internationally recognised industry leaders performing services similar to the Services for personal data of a similar nature to the Personal Data and shall in any event be at least in accordance with Good Industry Practice.
 - (iv) The Purchaser may, at reasonable intervals, request a written description of the technical and organisational methods employed by the Manufacturer and the Subcontractors. Within 30 days of such a request, the Manufacturer shall supply written particulars of all such measures detailed to a reasonable level such that the Purchaser can determine whether or not, in connection with the Personal Data, the Manufacturer is compliant with the DP Legislation.
- (d) Subcontractors
 - (i) The Manufacturer shall procure that all of its Subcontractors shall only undertake fair and lawful processing of Personal Data reasonably required in connection with this Agreement.
 - (ii) The Manufacturer shall not engage another data processor without prior specific or general written authorisation of the Purchaser. In the case of general written authorisation, the Manufacturer shall inform the Purchaser of any intended changes concerning the addition or replacement of other data processors, thereby giving the Purchaser the opportunity to object to such changes.
 - (iii) Where the Manufacturer engages another data processor for carrying out specific processing activities on behalf of the Purchaser, the same obligations as set out between the Manufacturer and Purchaser in this clause 38.13 shall be imposed on that other data processor by way of a contract, in particular providing sufficient guarantees to implement appropriate technical and organisational measures in such a manner that the processing will meet the requirements of the DP Legislation. Where that other data processor fails to fulfil its data protection obligations, the Manufacturer shall remain fully liable to the Purchaser for the performance of that other data processor's obligations.
- (e) Disclosure
 - (i) The Manufacturer shall not disclose any Personal Data other than:
 - (A) to those employees and Subcontractors to whom such disclosure is reasonably necessary in order for the Manufacturer to perform its obligations under this Agreement; or
 - (B) to the extent required under a court order,

provided that disclosure under clause 38.13(e)(i)(A) is made subject to written terms substantially the same as, and no less stringent than, the terms contained in this clause 38.13, and that the Manufacturer ensures such personnel have entered into confidentiality undertakings to protect the confidentiality of the Personal Data, and that the Manufacturer shall give notice in writing to the Purchaser of any disclosure of Personal Data it or a Subcontractor is required to make under clause 38.13(e)(i)(B) immediately once it is aware of such a requirement.
- (f) Notification
 - (i) The Manufacturer shall promptly notify the Purchaser if:

- (A) it receives any complaints about the Processing of Personal Data from third parties (including Data Subjects), and the Manufacturer shall not make any admissions or take any action which may be prejudicial to the defence or settlement of any such complaint, and shall assist the Purchaser in such manner as it may require in connection with such complaint; and
 - (B) a security breach has occurred or arisen or may occur or arise in relation to the Personal Data and shall co-operate with and provide all assistance in order for the Purchaser to comply with DP Legislation (or, if applicable, any security breach notification and Applicable Laws and Standards) in the event of such breach or threatened breach.
- (ii) The Manufacturer shall promptly notify the Purchaser if the Manufacturer obtains, on behalf of the Purchaser, any Personal Data from Data Subjects as part of the Services, give such individuals a data protection notice describing the intended use of such Personal Data, in a form approved by the Purchaser.
- (g) **Transfer**

The Manufacturer shall not transfer any Personal Data to any country or territory outside the European Economic Area without the prior written consent of the Purchaser.
- (h) **Termination**

Upon termination of this Agreement (howsoever arising), the Manufacturer shall, at the choice of the Purchaser, delete or return to the Purchaser all Personal Data provided to the Manufacturer and delete existing copies (unless any Applicable Laws and Standards requires the Manufacturer to store such Personal Data, in which case the Manufacturer shall store such data in compliance with DP Legislation).
- (i) The Manufacturer shall indemnify and keep indemnified the Indemnified Parties against all Losses incurred by any of the Indemnified Parties in respect of any breach of this clause 38 by the Manufacturer and/or any Subcontractor.

38.14 Return of Confidential Information

Save to the extent that the same may reasonably be required in respect of any current or anticipated litigation, on termination of this Agreement howsoever occurring, the Manufacturer shall return to the Purchaser or permanently delete and destroy any Confidential Information (including all copies thereof) supplied to it at any time (including at a time before the date of this Agreement) by the Purchaser or any other person with the knowledge and consent of the Purchaser, except where retention of any such Confidential Information is required by any Applicable Law or Standards or pursuant to any applicable stock exchange listing requirements (in which case the provisions of clause 38.1 shall continue to apply to such information).

38.15 Continuing obligation following termination of Agreement

The obligations of the Parties under this clause 38 shall continue in full force and effect notwithstanding termination of this Agreement.

38.16 Cyber security

The Manufacturer shall comply with the provisions of schedule 27 (Cyber Security).

39. **FREEDOM OF INFORMATION**

- 39.1 For the purposes of this Agreement, "**Information**" means information recorded in any form held by the Purchaser or held by the Manufacturer on behalf of the Purchaser.
- 39.2 The Manufacturer acknowledges that the Purchaser is subject to the FOI Legislation and agrees to assist and co-operate with the Purchaser to enable the Purchaser to comply with its obligations under the FOI Legislation. This shall not preclude the Manufacturer from objecting to a disclosure of Information.
- 39.3 Without prejudice to the generality of clause 39.2, the Manufacturer shall and shall procure that its Subcontractors shall:
- (a) transfer to the company secretary of the Purchaser (or such other person as may be notified by the Purchaser to the Manufacturer) all FOI Information Requests received as soon as practicable and in any event within two (2) Working Days of receiving an FOI Information Request; and
 - (b) in relation to Information held by the Manufacturer on behalf of the Purchaser, provide to the Purchaser on request, details about and/or a copy of all such Information, such Information to be provided within five (5) Working Days of receipt of a copy of the FOI Information Request (or such other period as the Purchaser may reasonably specify), and in such form as the Purchaser may reasonably specify.
- 39.4 Where the Purchaser receives an FOI Information Request relating to a Purchased Item, otherwise related to the Works, this Agreement or the FSA, the Purchaser shall as soon as practicable, and in any event within five (5) Working Days, send a copy of such FOI Information Request to the Manufacturer and shall consult the Manufacturer as to how disclosure under the FOI Legislation would affect the Manufacturer's and/or any of the Key Subcontractors' commercial interests.
- 39.5 The Purchaser shall be responsible for determining whether Information is exempt information under the FOI Legislation and for determining what Information will be disclosed in response to an FOI Information Request in accordance with the FOI Legislation. The Manufacturer shall not itself respond to any person making an FOI Information Request, save to acknowledge receipt, unless expressly authorised to do so by the Purchaser.
- 39.6 Notwithstanding clause 38, The Manufacturer acknowledges that the Purchaser may be obliged under the FOI Legislation to disclose Information without either consulting with, or obtaining consent from, the Manufacturer.

40. **DISPUTE RESOLUTION**

- 40.1 Except where expressly designated as an Expert Dispute, any Dispute shall be resolved in accordance with the procedures for Disputes set out in schedule 19 (Dispute Resolution Procedure).
- 40.2 Nothing in this Agreement shall prevent either Party from seeking injunctive relief, specific performance or other equitable relief.

41. **RESPONSIBLE PROCUREMENT, EQUALITY AND ANTI-BRIBERY**

- 41.1 The Manufacturer shall comply with the provisions of schedule 14 (Responsible Procurement).
- 41.2 The Manufacturer shall, at no additional cost to the Purchaser, assist and co-operate with the Purchaser where necessary to assist the Purchaser to comply with:

- (a) all relevant guidance, enactments, orders, regulations or instruments in force from time to time relating to discrimination in employment and the promotion of equal opportunities; and
 - (b) its duty under section 149 of the Equality Act 2010 to have due regard to the need to eliminate unlawful discrimination on the grounds of sex, marital or civil partnership status, race, sexual orientation, religion or belief, age, pregnancy or maternity, gender reassignment or disability (a **"Relevant Protected Characteristic"**) (as the case may be) and to promote equality of opportunity between persons who share a Relevant Protected Characteristic and persons who do not share it.
- 41.3 The Manufacturer shall if required, at no additional cost to the Purchaser, provide in a timely manner all such assistance to the Purchaser as the Purchaser may reasonably require in connection with the Purchaser's anti-corruption and anti-bribery procedures in compliance with the Bribery Act 2010.
- 41.4 The Manufacturer shall:
- (a) promptly inform the Purchaser where formal proceedings have been issued or commenced against it in relation to an allegation, complaint or information with regard to a Prohibited Act or offence under the Money Laundering Regulations 2007 relating to the Works;
 - (b) following any notification pursuant to clause 41.4(a), provide such updates and/or copies of the Manufacturer's Records as the Purchaser may request in relation to such alleged Prohibited Act or offence under the Money Laundering Regulations 2007;
 - (c) without prejudice to any similar obligation contained within this Agreement, keep books and records of all financial transactions and expenditures in connection with the Works and permit the Purchaser to review and take copies of the same; and
 - (d) ensure that all Subcontracts which are entered into in connection with the Works impose obligations on the relevant Subcontractor which are identical in effect to the obligations set out in clauses 41.4(a) to 41.4(c).
- 41.5 Notwithstanding any confidentiality obligation contained within this Agreement, the Manufacturer acknowledges, and shall procure that all Subcontractors acknowledge, that all information acquired by the Purchaser pursuant to clause 41.4 may be provided to any bank or other institution which may be providing finance to any member of the TfL Group in connection with this Agreement.

42. **SAFETY, QUALITY AND ENVIRONMENTAL PLAN**

Health, Safety and Environment

- 42.1 The Manufacturer shall be responsible for health and safety management in accordance with its certified health and safety management systems pursuant to the requirements of schedule 16 (Health, Safety and Environment).
- 42.2 The Manufacturer shall develop and implement an Environmental Plan in accordance with the provisions of Appendix 2 (Environmental Plan) to schedule 16 (Health, Safety and Environment).

42.3 **Quality**

- (a) The Manufacturer shall establish, implement and maintain the Quality Management Plans in accordance with paragraph 10 of schedule 5 (Contract Management) and

accordingly be responsible for quality management for a Fleet until Fleet Acceptance of that Fleet and shall ensure that its Subcontractors have similarly certified quality management systems in place.

(b) **Quality Standards**

- (i) The Manufacturer shall establish quality standards ("**Quality Standards**") to be used throughout the provision of the Works in order to maintain quality and consistency. The Quality Standards shall be based upon photographic or diagrammatic material and, where appropriate, shall be supported by physical "glass case" samples. The format and content of the Quality Standards shall be submitted to the Purchaser for Approval and the Manufacturer shall ensure that copies of the Quality Standards are placed in the Technical Library. The Manufacturer shall ensure that copies of the Quality Standards are used by the Manufacturer's and Subcontractor's manufacturing personnel and quality assurance personnel where relevant.
- (ii) The Quality Standards shall include, but not be limited to, the following areas:
 - (A) wiring – including harness runs, cable ties, protective sheathing, screening, markers, labelling, termination, connectors, enclosure wiring, segregation and cleanliness of cable routes;
 - (B) piping – including piping runs, hose orientations and clamping;
 - (C) train interior – including panel fit, colour match, paint finish, seats and armrests, pattern matching, flooring, lighting, maps and signage;
 - (D) equipment installation - including torque marking, secondary locking and secondary retention;
 - (E) car body – including welds, paint finish, glazing, insulation and signage;
 - (F) cab and control console; and
 - (G) gangways.

43. **ASSIGNMENT, TRANSFER AND SUB CONTRACTING BY THE MANUFACTURER**

43.1 **Subcontracting**

- (a) Subject to clause 9.1 and the remainder of this clause 43.1, the Manufacturer shall be free to subcontract any of its obligations under this Agreement, provided that the Manufacturer shall retain full responsibility and liability for the performance of its Subcontractors, and shall procure that such Subcontractors, in the performance of their respective obligations, observe and comply with all undertakings relating to their respective obligations on the part of the Manufacturer in this Agreement.
- (b) The Manufacturer shall not:
 - (i) enter into a Key Subcontract;
 - (ii) terminate or agree to the termination of all or part of any Key Subcontract;
 - (iii) make or agree to any material variation of any Key Subcontract;

- (iv) in any material respect depart from its obligations (or waive or allow to lapse any rights it may have in a material respect), or procure that others in any material respect depart from their obligations (or waive or allow to lapse any rights they may have in a material respect), under any Key Subcontract; or
- (v) enter into (or permit the entry into by any other person of) any agreement replacing all or part of (or otherwise materially and adversely affecting the interpretation of) any Key Subcontract,

without the prior written consent of the Purchaser in each case to such proposed course of action.

- (c) The Manufacturer shall obtain prior written consent from the Purchaser in relation to the identity of each Key Subcontractor and the replacement of the same and in executing this Agreement, the Purchaser hereby provides such consent to the identity of each of the Key Subcontractors listed as having been approved at the date of this Agreement in column 5 of the Table Part A: of schedule 11 (Subcontracts).
- (d) Unless the Purchaser otherwise agrees, in respect of a Key Subcontract, the Manufacturer shall not enter into any such Key Subcontract unless the counterparty to that prospective Key Subcontract has entered into a Direct Agreement with the Purchaser in respect of such Key Subcontract.
- (e) The Purchaser shall be deemed to have approved any amendment to the Key Subcontracts which is required as a result of any change made to this Agreement agreed by the Parties in accordance with the terms of this Agreement (provided that any such changes are made in accordance with the Change Procedure and the Key Subcontractor changes correspond in all material respects with the change made to this Agreement).
- (f) For the avoidance of doubt, the giving of consent by the Purchaser to the identity of the Key Subcontractors or the knowledge, review or approval of the terms of any Key Subcontract shall not relieve the Manufacturer of any of its obligations under this Agreement, or allow the Manufacturer to amend or alter any of the Manufacturer's obligations under this Agreement, or entitle the Manufacturer to any relief or compensation, or render the Purchaser in any way liable to any Key Subcontractor.

43.2 **Assignment**

Without prejudice to clause 43.1, the Manufacturer shall not:

- (a) assign (whether absolutely or by way of security), transfer, mortgage, charge, declare itself a trustee for a third party of, or otherwise dispose of (in any manner whatsoever) this Agreement or any benefit or interest therein:
 - (i) to any member of the Manufacturer's Group except by way of assignment, transfer or novation of all of the Manufacturer's rights, title and obligations under this Agreement:
 - (A) where the Guarantor has to the reasonable satisfaction of the Purchaser provided a guarantee in the form of the Guarantee in respect of the assignee's rights and obligation; and
 - (B) with the prior written consent of the Purchaser (not to be unreasonably withheld or delayed); nor

- (ii) to any other person without the prior written consent of the Purchaser (acting in its absolute discretion); or
- (b) create or agree to create or permit to subsist any Security Interest on or over the Trains or the Equipment without the prior written consent of the Purchaser (acting in its absolute discretion),

and any purported dealing in contravention of this clause 43.2 shall be ineffective.

43.3 Indemnity

The Manufacturer shall indemnify the Purchaser on an after tax basis against any costs, expenses and liabilities it would not have incurred but for an assignment, charge or other dealing in accordance with (and to the extent permitted under) clause 43.2.

44. ASSIGNMENT AND NOVATION OR GRANTING OF SECURITY BY THE PURCHASER

44.1 Transfer etc. by the Purchaser

Without prejudice to clause 44.3, the Purchaser shall be entitled to assign (whether absolutely or by way of security and whether in whole or in part), transfer, novate, mortgage, charge, or otherwise dispose of any or all of its rights and/or obligations under this Agreement (including its payment obligations):

- (a) without the consent of the Manufacturer:
 - (i) to any member of the TfL Group or a Minister of the Crown;
 - (ii) to a third party provided that such third party is a Suitable Lessor; or
 - (iii) to a third party which is neither a Suitable Lessor nor a Competitor where the manner of the assignment, novation, mortgage, charge or other disposal of the rights and/or obligations under this Agreement is such that where the assignee, novatee or other beneficiary of the transferred rights and/or obligations does not fully perform the transferred obligations then the responsibility for the discharge of such unperformed obligations shall revert to the Purchaser or other member of the TfL Group; or
- (b) with the prior written consent of the Manufacturer (such consent not to be unreasonably withheld), to any third party (but without prejudice to clause 44.3).

The Purchaser shall notify the Manufacturer where it has assigned, transferred, novated, mortgaged, charged or otherwise disposed of any or all of its rights and/or obligations without the consent of the Manufacturer (in accordance with this clause 44) in accordance with this Agreement (including its payment obligations).

44.2 Implementation of Transfers

If the Purchaser wishes to deal with its rights and/or obligations in this Agreement (either in whole or in part) pursuant and subject to clause 44.1, the Manufacturer shall execute such documents and do such other things as the Purchaser may reasonably request in order to facilitate and perfect such dealing.

44.3 Purchaser Novation

- (a) Without prejudice to clauses 44.1 and 44.2, the Purchaser may at any time elect to novate its rights and obligations under this Agreement to:
 - (i) a Minister of the Crown; or

(ii) a member of the TfL Group,

each, a **"Permitted Party"**.

- (b) If the Purchaser wishes to exercise its right of novation under this clause 44.3, it shall give due notice to the Manufacturer no later than 28 days prior to such novation.
- (c) The Manufacturer shall, within 14 days of a notice from the Purchaser pursuant to clause 44.3(b):
- (i) enter into a deed of novation in the form or substantially in the form of the deed of novation in Part B: (Deed of Novation) of schedule 21 (Pro Forma Certificates) with the Purchaser and the relevant Permitted Party; and
 - (ii) enter into any other documents reasonably requested by the Purchaser in relation to such novation.

45. CHANGE OF CONTROL OF THE PURCHASER

45.1 Restriction on Change of Control

- (a) For the purposes of this clause 45.1, a **"Change of Control of the Purchaser"** means the Purchaser (which, for the purposes of this clause 45.1 includes reference to any other person in whom all or any of the rights and obligations in the Project Documents expressed to be rights and obligations of the Purchaser are vested for the time being) ceasing to be owned and controlled directly or indirectly by or on behalf of one or more of the following:
- (i) a Minister of the Crown; or
 - (ii) the Mayor or the Greater London Authority or any statutory successor thereto; or
 - (iii) TfL or any statutory successor thereto; or
 - (iv) any public or statutory corporation or limited liability company which is owned and controlled directly or indirectly by any of the persons referred to in clause 45.1(a)(i) or 45.1(a)(ii).
- (b) For the purposes of this clause 45.1, the expression **"owned and controlled"** shall mean possessing:
- (i) in relation to a body corporate having a share capital, 90 per cent or more of the issued equity share capital of that body having voting power exercisable at general meetings of that body; and
 - (ii) in relation to any other body (whether or not corporate), the power to appoint or remove all or substantially all of the members of the Board of that body and the term **"Board"** shall mean the persons who have the management and control of the relevant entity and similar powers and responsibilities to those of directors of a body corporate.
- (c) For the purposes of this clause 45.1, a **"statutory successor"** means, in relation to a person, the person in whom the statutory functions of such first mentioned person relating to the development, operation and funding of road and rail transport in Greater London are vested from time to time.

- (d) For the purposes of this clause 45.1, the **"Relevant Date"** means the date on which a Change of Control of the Purchaser takes place.
- (e) The Purchaser shall give to the Manufacturer at least 90 days' notice prior to the date on which the Purchaser reasonably believes the Relevant Date is likely to occur.
- (f) If the Purchaser gives notice to the Manufacturer under clause 45.1(e), then:
 - (i) the Purchaser may propose alternative arrangements to the Manufacturer; and
 - (ii) the Manufacturer shall consider on a reasonable basis such proposed alternative arrangements,

such that this Agreement may be continued on its then existing terms without the Manufacturer seeking to exercise its right to terminate this Agreement in accordance with clause 31 (Purchaser Default).
- (g) If the Manufacturer and Purchaser are not able to agree as to alternative arrangements set out in clause 45.1(f), and the Manufacturer demonstrates to the reasonable satisfaction of the Purchaser that the Change of Control of the Purchaser has resulted in a material adverse effect on the Manufacturer, then a Purchaser Event of Default shall be deemed to have occurred as of the Relevant Date in accordance with clause 31 (Purchaser Default) otherwise, this Agreement will continue on its existing terms.
- (h) The Parties acknowledge that the provisions of this clause 45.1 are intended to ensure that the Manufacturer is placed in a no less favourable and a no more favourable position, as a result of a Change of Control of the Purchaser, than if the Relevant Date had not occurred, and the Manufacturer and the Purchaser undertake to exercise their respective rights under this clause 45.1 in a reasonable manner so as to give effect to the intention of the Parties as set out in this clause 45.1(h).

46. **CHANGE OF CONTROL OF THE MANUFACTURER**

46.1 **Restriction on Change of Control**

- (a) Subject to clauses 46.1(b), 46.1(c) and 46.1(d) the Manufacturer shall procure that at any time prior to Fleet Acceptance of the Base Order or, if exercised, the later of the Whole Line Options to have been exercised at the relevant date, no Change of Control occurs in respect of:
 - (i) the Manufacturer; and/or
 - (ii) any person who has a direct or indirect shareholding or interest in the Manufacturer, including any member of the Manufacturer Group who has a direct or indirect shareholding or interest in the Manufacturer,

without the prior consent to such Change of Control being given by the Purchaser in writing which will not be unreasonably withheld.
- (b) Subject to clause 46.1(c) the provisions of clause 46.1(a)(ii) shall not apply to any Change of Control in a person whose direct or indirect shareholding or interest in the Manufacturer solely arises from holding equity securities or securities convertible into equity securities in a person (**"Listed Person"**) who has a direct or indirect shareholding or interest in the Manufacturer and those equity securities

or securities convertible into equity securities are listed on a Recognised Investment Exchange.

- (c) clause 46.1(b) shall only apply for so long as the equity securities or securities convertible into equity securities in the Listed Person are quoted on a Recognised Investment Exchange, and the sale or disposal of equity securities and/or securities convertible into equity securities as a result of which any third party acquiring title to such equity securities and/or securities convertible into equity securities becomes capable of and/or proposes to remove the equity securities of the Listed Person from being quoted on a Recognised Investment Exchange shall constitute a Change of Control and the provisions of this clause 46 shall apply.
- (d) The provisions of clause 46.1 shall not apply to any Change of Control to the Manufacturer and/or a person described in clause 46.1(a)(ii) if following the Change of Control the Manufacturer or the person described in clause 46.1(a)(ii) (as the case may be) continues to be part of the Manufacturer Group.

46.2 Procedure for Approving Change of Control

- (a) In the event that a Change of Control is proposed in respect of the Manufacturer and/or any person described in clause 46.1(a)(ii) the Manufacturer shall (unless prevented from doing so by any law or securities regulation applicable to the Manufacturer or any member of the Manufacturer's Group) give the Purchaser not less than 60 days written notice of the proposed Change of Control together with all such information about the proposed Change of Control as may be reasonable for the Purchaser to determine whether it ought to consent to such Change of Control.
- (b) If the Purchaser does not consent to the proposed Change of Control the Manufacturer shall withdraw the proposed Change of Control and shall procure that such Change of Control is not implemented by any person.
- (c) Where the Manufacturer is not permitted by law or securities regulation to give the Purchaser at least 60 days prior notice of a proposed Change of Control, the Manufacturer shall give the Purchaser written notice of the Change of Control as soon as it is permitted to do so in accordance with such law or securities regulation.

46.3 Grounds of Objection

Without limitation to the Purchaser's right to withhold its consent to a Change of Control, the Manufacturer acknowledges and agrees that, it shall be reasonable for the Purchaser to withhold its consent to a proposed Change of Control where:

- (a) the transfer of equity securities and/or securities convertible into equity securities does not comply with the requirements of this clause 46;
- (b) the proposed new holder of equity securities and/or securities convertible into equity securities is an Undesirable Transferee;
- (c) the Change of Control would result in a breach of the terms of any Relevant Approval;
- (d) the Purchaser reasonably considers that as a result of the proposed Change of Control the Manufacturer would:
 - (i) be unable to perform, or would be materially prejudiced in its ability to perform, its obligations under this Agreement;

- (ii) cease to be able to satisfy the relevant Competent Authority as to its ability to continue to satisfy the requirements of the ROGS;
- (iii) cease to have the appropriate management skills, resources, technical competence and financial standing (or the technical and financial resources available) to enable it to perform its obligations under this Agreement;
- (iv) cease to have the requisite capacity, power, and authority (including any necessary authorisations and consents) to perform its obligations under this Agreement; and/or
- (v) cease to be able to provide the requisite stability of service delivery to enable it to perform its obligations under this Agreement.

46.4 **Unapproved Change of Control**

If a Change of Control occurs without the written approval of the Purchaser being given under this clause 46, a Manufacturer Event of Default shall be deemed to have occurred in accordance with clause 30.1(e) of this Agreement.

47. **NOTICES**

47.1 **Requirement for notice in writing**

Any notice, consent, approval, Approval, certificate or determination to be given or issued by any person under this Agreement shall be deemed a "notice" and shall be in writing unless otherwise specified and the words "notify", "consent", "approve", "certify" and "determined" shall be construed accordingly.

47.2 The Parties shall comply with the requirements of schedule 5 (Contract Management) in respect of the form of communications to be served under this Agreement.

47.3 **Service of notices**

Subject to clause 47.4, any notice made under or in connection with the matters contemplated by this Agreement shall be deemed duly given if delivered personally or sent by email or by prepaid first-class post or by airmail (if posted to or from a place outside the United Kingdom) in accordance with the requirements of this clause 47.

47.4 The service of any certificate, Change Confirmation Notice in accordance with schedule 12 (Change Procedure) or notice of termination pursuant to this Agreement shall be effected by any means specified in clause 47.3 (including as a scan of the original signed document attached to an email) except in the body of an email.

47.5 The relevant details of each Party at the date of this Agreement are:

Purchaser

Address:

[REDACTED]

Address:

[REDACTED]

47.6 **Time of service**

A notice shall be deemed to have been received:

- (a) if delivered by hand, at the time when the notice is left at the address of the Party to be served;
- (b) if sent by first-class post, on the first Working Day following the day of posting or, if the day of posting was not a Working Day, the second Working Day;
- (c) if sent by airmail, five (5) Working Days after the day of posting; and
- (d) if sent by email, upon receipt by the sender of a "delivered" confirmation (provided that the sender shall not be required to produce a "read" confirmation),

provided that if, in accordance with the above provision, any such notice would otherwise be deemed to be given or made after 5.00 p.m. such notice shall be deemed to be given or made at 9.00 a.m. on the next Working Day. For the purposes of this clause 47.6, all times are to be read as local time in the place of deemed receipt.

47.7 **Change of details**

A Party may notify the other Parties to this Agreement of a change to its name, relevant addressee, postal address or email address to update the information in clause 47.5 provided that such notification shall only be effective:

- (a) on the date specified in the notification as the date on which the change is to take place; or
- (b) if no date is specified or the date specified is less than five (5) Working Days after the date on which notice is given, the date falling five (5) Working Days after notice of any such change has been given.

48. **ENTIRE AGREEMENT**

This Agreement together with the other Project Documents constitute the entire agreement between the Parties hereto in connection with the subject matter of this Agreement. No party has relied upon any representation save for any representation expressly set out in the Project Documents.

49. **PRIORITY OF DOCUMENTS**

Without prejudice to clause 7 (Manufacturer's General Obligations) and clauses 8.1, 8.2 and 8.6, in the case of any inconsistency or discrepancy between the documents forming part of this Agreement, the body of this Agreement shall take precedence over the schedules.

50. **NO PARTNERSHIP OR AGENCY**

Nothing in this Agreement and no action taken by the Parties pursuant to this Agreement shall constitute, or be deemed to constitute, a partnership, unincorporated association or other co-operative agency. The Manufacturer shall not be or be deemed to be the agent of the Purchaser and the Manufacturer shall not hold itself out as having authority or power to bind the Purchaser in any way.

51. **STATUTORY NOTICES**

- 51.1 If any statutory notice relating to the subject matter of this Agreement or naming the Purchaser or a member of the Tfl Group as a party is served on the Manufacturer or any

of its Subcontractors, the Manufacturer shall immediately (or in the case of a statutory notice served on a Subcontractor, immediately such statutory notice comes into the Manufacturer's possession provided that the Manufacturer imposes a requirement in its Subcontracts or supply contracts that the Subcontractors forward any such statutory notices to the Manufacturer) inform the Purchaser and provide the Purchaser with a copy of such statutory notice.

51.2 Where the Manufacturer receives any "letters of claim", writs and/or summons naming the Purchaser or a member of the TfL Group as a party or which may affect the Manufacturer's ability to perform this Agreement, it shall provide the same or a copy immediately to the Purchaser.

51.3 Where the Manufacturer receives any letters, faxes, emails or other communication from any person holding the Purchaser, any member of the TfL Group and/or any of their respective employees, agents or contractors responsible for any incident, the Manufacturer shall consult immediately with the Purchaser and obtain the Purchaser's approval prior to giving any response to such letters, faxes or other communication.

52. **SOLE REMEDY AND DISCLAIMER**

52.1 **Rights of the Manufacturer**

Without prejudice to any entitlement of the Manufacturer:

- (a) to specific performance of any obligation under this Agreement;
- (b) to injunctive relief; or
- (c) to seek redress from the Purchaser for any liability relating to death or personal injury caused by the Purchaser,

the Manufacturer's sole remedy in relation to matters for which an express right or remedy is stated in this Agreement shall be that right or remedy and the Manufacturer shall have no additional right or remedy arising by common law, in equity, by statute or otherwise.

52.2 **Disclaimer**

Without prejudice to clauses 7.6, 8.4, 8.5 and 52.1 and except in the case of fraud, wilful default or gross negligence on the part of the Purchaser or any of its officers, employees and agents, the Purchaser shall not be liable to the Manufacturer (whether in contract, tort or otherwise howsoever caused) in respect of any inaccuracy, error, omission, unfitness for purpose, defect or inadequacy of any kind whatsoever in the Disclosed Data. For the purpose of this Agreement, "**Disclosed Data**" means the materials, documents and data made available by the Purchaser or on behalf of the Purchaser to the Manufacturer prior to the date hereof in relation to the obligations undertaken by the Manufacturer under this Agreement. The Disclosed Data includes, without limitation, all such materials, documents and data which were provided to the Manufacturer, the Subcontractors or their respective officers, employees, agents, contractors and advisers in connection with the instruction to bidders issued in connection with the Project.

52.3 **No liability for review and approval by the Purchaser**

The Manufacturer acknowledges that it shall rely entirely on its own skill and judgment in the performance of its duties and obligations under this Agreement. Accordingly:

- (a) the duties, obligations and liabilities of the Manufacturer shall not be released, diminished or in any other way affected by any instruction, direction, admission, consent, approval, confirmation, comment, sanction, acknowledgment or advice

made or given by or on behalf of the Purchaser or by any independent entity into any relevant matter which may be made or carried out by or on behalf of the Purchaser nor by any act or omission of any person carrying out such enquiry, whether or not such act or omission might give rise to an independent liability of such person to the Purchaser; and

- (b) the Manufacturer shall not be entitled to make any claim against the Purchaser or to seek any relief or remedy of any nature by reason of any such action by or on behalf of the Purchaser.

53. FURTHER ASSURANCE

Each Party agrees that it shall now or at any time during the subsistence of this Agreement, do or procure the doing of all such acts and/or execute or procure the execution of all such documents in a form satisfactory to the other Parties, as the other Parties may reasonably require for giving full effect to and obtaining the full benefit of the rights, powers and remedies conferred upon such other Party or Parties by this Agreement.

54. SET OFF

- 54.1 The Manufacturer shall not be entitled to retain or set off from any amount due to the Purchaser by it, but the Purchaser may retain or set off any amount owed to it by the Manufacturer under this Agreement or the Service Provider under the FSA which has fallen due and payable against any amount due to the Manufacturer under this Agreement.
- 54.2 If the payment or deduction of any amount referred to in this Agreement is disputed then any undisputed element of that amount shall be paid and the disputed element shall be dealt with in accordance with schedule 19 (Dispute Resolution Procedure).
- 54.3 Where the Purchaser is entitled to net off or set off any amount due to the Manufacturer under this Agreement in respect of supplies made by the Manufacturer under this Agreement, the Manufacturer shall ensure that the full value of the supplies is recognised for the purpose of accounting for any VAT due (i.e. the value before any related payments are offset under this clause 54).

55. NO WAIVER

- 55.1 No term or provision of this Agreement shall be considered as waived by any Party to this Agreement unless a waiver is given in writing by such Party.
- 55.2 No waiver under clause 55.1 shall be a waiver of a past or future default or breach, nor shall it amend, delete or add to the terms, conditions or provisions of this Agreement unless (and then only to the extent) expressly stated in that waiver.
- 55.3 No variation to this Agreement shall be effective unless recorded in a written instrument in accordance with schedule 12 (Change Procedure).

56. ILLEGALITY AND SEVERABILITY

If at any time any provision of this Agreement (or part thereof) is or becomes illegal or invalid or unenforceable in any respect under the law of any relevant jurisdiction, such illegality, invalidity or unenforceability shall not affect or impair the legality, validity or enforceability in that jurisdiction of any other part of that provision or any other provision of this Agreement or, in any other jurisdiction, of that provision or part thereof or any other provision of this Agreement.

57. **COSTS**

Each Party shall be responsible for their own costs (including legal costs) in relation to the negotiation and execution of this Agreement.

58. **LANGUAGE**

The language of this Agreement is the English language.

59. **EXCHANGE RATE RISK**

Subject to clause 2.7(g), all risks associated with movements in foreign currency exchange rates and/or the costs of activities performed outside of the United Kingdom shall be borne by the Manufacturer, from the date of this Agreement in relation to the Base Order and from the date of a Base Order Option Notice, in relation to the relevant Base Order Option, subject to the application of the Financial Close Protocol.

60. **THIRD PARTY RIGHTS**

60.1 A person who is not a Party or an Indemnified Party has no right under the Contracts (Rights of Third Parties) Act 1999 to enforce a right expressly or impliedly conferred by this Agreement. This does not affect any right or remedy of a third party which exists or is available apart from under the Contracts (Rights of Third Parties) Act 1999.

60.2 Any amendment, variation or termination of this Agreement may be effected by the Parties to this Agreement in accordance with its terms and without the consent of any Indemnified Party (other than the Purchaser), notwithstanding the rights of that Indemnified Party under the Contracts (Rights of Third Parties) Act 1999.

61. **COUNTERPARTS**

This Agreement may be executed in any number of counterparts and by the several Parties to it on separate counterparts, each of which when so executed and delivered shall be an original, but all the counterparts shall together constitute one and the same instrument.

62. **GOVERNING LAW AND JURISDICTION**

This Agreement and any non-contractual relations arising out of or in connection with it shall be governed by and construed in accordance with English law and, subject to the provisions of clause 40 (Dispute Resolution), shall be subject to the exclusive jurisdiction of the English Courts.

IN WITNESS whereof this document has been executed and delivered as a deed on the date first above written.

Executed as a deed by **SIEMENS**)
MOBILITY LIMITED)
acting by two authorised signatories:)
)

Signature of authorised signatory

Name of authorised signatory

Signature of authorised signatory

Name of authorised signatory

Executed as a deed by affixing)
the common seal of **LONDON**)
UNDERGROUND LIMITED in the)
presence of:)
)

Signature of authorised signatory

Name of authorised signatory

SCHEDULE 1

Train Technical Specification

SCHEDULE 2
Manufacturer Train Proposal

[REDACTED]

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Year	Country	Population (millions)	Urban population (millions)	Urban population (%)
1950	Algeria	2.5	0.5	20
1955	Algeria	2.6	0.6	23
1960	Algeria	2.7	0.7	26
1965	Algeria	2.8	0.8	29
1970	Algeria	2.9	0.9	31
1975	Algeria	3.0	1.0	33
1980	Algeria	3.1	1.1	35
1985	Algeria	3.2	1.2	38
1990	Algeria	3.3	1.3	40
1995	Algeria	3.4	1.4	41
2000	Algeria	3.5	1.5	43
2005	Algeria	3.6	1.6	44
2010	Algeria	3.7	1.7	46
2015	Algeria	3.8	1.8	47
2020	Algeria	3.9	1.9	49
2025	Algeria	4.0	2.0	50
2030	Algeria	4.1	2.1	51
2035	Algeria	4.2	2.2	52
2040	Algeria	4.3	2.3	53
2045	Algeria	4.4	2.4	55
2050	Algeria	4.5	2.5	56
2055	Algeria	4.6	2.6	57
2060	Algeria	4.7	2.7	58
2065	Algeria	4.8	2.8	58
2070	Algeria	4.9	2.9	59
2075	Algeria	5.0	3.0	60
2080	Algeria	5.1	3.1	61
2085	Algeria	5.2	3.2	62
2090	Algeria	5.3	3.3	62
2095	Algeria	5.4	3.4	63
2100	Algeria	5.5	3.5	64

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№	Имя	Фамилия	Пол	Дата рождения
1	Иван	Иванов	Муж	1990-01-15
2	Петр	Петров	Муж	1985-03-22
3	Александр	Смирнов	Муж	1992-07-10
4	Мария	Васильева	Жен	1988-05-18
5	Сергей	Кузнецов	Муж	1995-11-05
6	Елена	Попов	Жен	1991-09-20
7	Дмитрий	Левченко	Муж	1987-04-12
8	Анна	Зайцева	Жен	1993-12-01
9	Владимир	Михайлов	Муж	1989-08-25
10	Ольга	Новикова	Жен	1994-06-14
11	Алексей	Воробьев	Муж	1986-10-30
12	Светлана	Сидорова	Жен	1990-02-28
13	Игорь	Павлов	Муж	1992-04-09
14	Юлия	Климова	Жен	1988-07-17
15	Андрей	Морозов	Муж	1995-03-03
16	Татьяна	Иванова	Жен	1991-11-21
17	Василий	Петров	Муж	1987-05-11
18	Зинаида	Кузнецова	Жен	1993-09-07
19	Антон	Левченко	Муж	1989-12-19
20	Мария	Зайцева	Жен	1994-08-04
21	Денис	Михайлов	Муж	1986-01-26
22	Анна	Новикова	Жен	1990-10-13
23	Александр	Воробьев	Муж	1992-03-02
24	Екатерина	Сидорова	Жен	1988-06-24
25	Игорь	Павлов	Муж	1995-04-16
26	Светлана	Климова	Жен	1991-07-08
27	Андрей	Морозов	Муж	1987-11-29
28	Татьяна	Иванова	Жен	1993-02-11
29	Василий	Петров	Муж	1989-05-03
30	Зинаида	Кузнецова	Жен	1994-09-25
31	Антон	Левченко	Муж	1990-12-17
32	Мария	Зайцева	Жен	1995-03-09
33	Денис	Михайлов	Муж	1986-06-01
34	Анна	Новикова	Жен	1991-09-23
35	Александр	Воробьев	Муж	1992-12-15
36	Екатерина	Сидорова	Жен	1988-03-07
37	Игорь	Павлов	Муж	1995-06-29
38	Светлана	Климова	Жен	1991-09-21
39	Андрей	Морозов	Муж	1987-12-13
40	Татьяна	Иванова	Жен	1993-03-05
41	Василий	Петров	Муж	1989-06-27
42	Зинаида	Кузнецова	Жен	1994-09-19
43	Антон	Левченко	Муж	1990-12-11
44	Мария	Зайцева	Жен	1995-03-03
45	Денис	Михайлов	Муж	1986-06-25
46	Анна	Новикова	Жен	1991-09-17
47	Александр	Воробьев	Муж	1992-12-09
48	Екатерина	Сидорова	Жен	1988-03-31
49	Игорь	Павлов	Муж	1995-06-23
50	Светлана	Климова	Жен	1991-09-15
51	Андрей	Морозов	Муж	1987-12-07
52	Татьяна	Иванова	Жен	1993-03-29
53	Василий	Петров	Муж	1989-06-21
54	Зинаида	Кузнецова	Жен	1994-09-13
55	Антон	Левченко	Муж	1990-12-05
56	Мария	Зайцева	Жен	1995-03-27
57	Денис	Михайлов	Муж	1986-06-19
58	Анна	Новикова	Жен	1991-09-11
59	Александр	Воробьев	Муж	1992-12-03
60	Екатерина	Сидорова	Жен	1988-03-25
61	Игорь	Павлов	Муж	1995-06-17
62	Светлана	Климова	Жен	1991-09-09
63	Андрей	Морозов	Муж	1987-12-01
64	Татьяна	Иванова	Жен	1993-03-23
65	Василий	Петров	Муж	1989-06-15
66	Зинаида	Кузнецова	Жен	1994-09-07
67	Антон	Левченко	Муж	1990-12-29
68	Мария	Зайцева	Жен	1995-03-21
69	Денис	Михайлов	Муж	1986-06-13
70	Анна	Новикова	Жен	1991-09-05
71	Александр	Воробьев	Муж	1992-12-27
72	Екатерина	Сидорова	Жен	1988-03-19
73	Игорь	Павлов	Муж	1995-06-11
74	Светлана	Климова	Жен	1991-09-03
75	Андрей	Морозов	Муж	1987-12-25
76	Татьяна	Иванова	Жен	1993-03-17
77	Василий	Петров	Муж	1989-06-09
78	Зинаида	Кузнецова	Жен	1994-09-01
79	Антон	Левченко	Муж	1990-12-23
80	Мария	Зайцева	Жен	1995-03-15
81	Денис	Михайлов	Муж	1986-06-07
82	Анна	Новикова	Жен	1991-09-29
83	Александр	Воробьев	Муж	1992-12-21
84	Екатерина	Сидорова	Жен	1988-03-13
85	Игорь	Павлов	Муж	1995-06-05
86	Светлана	Климова	Жен	1991-08-27
87	Андрей	Морозов	Муж	1987-11-19
88	Татьяна	Иванова	Жен	1993-02-11
89	Василий	Петров	Муж	1989-05-03
90	Зинаида	Кузнецова	Жен	1994-08-25
91	Антон	Левченко	Муж	1990-11-17
92	Мария	Зайцева	Жен	1995-04-09
93	Денис	Михайлов	Муж	1986-07-01
94	Анна	Новикова	Жен	1991-10-23
95	Александр	Воробьев	Муж	1992-01-15
96	Екатерина	Сидорова	Жен	1988-04-07
97	Игорь	Павлов	Муж	1995-07-29
98	Светлана	Климова	Жен	1991-10-21
99	Андрей	Морозов	Муж	1987-01-13
100	Татьяна	Иванова	Жен	1993-04-05

№	Имя	Фамилия	Пол	Дата рождения
1	Иванов	Иван	М	1990-01-01
2	Петров	Петр	М	1990-02-02
3	Сидоров	Сидор	М	1990-03-03
4	Сидоров	Сидор	М	1990-04-04
5	Сидоров	Сидор	М	1990-05-05
6	Сидоров	Сидор	М	1990-06-06
7	Сидоров	Сидор	М	1990-07-07
8	Сидоров	Сидор	М	1990-08-08
9	Сидоров	Сидор	М	1990-09-09
10	Сидоров	Сидор	М	1990-10-10
11	Сидоров	Сидор	М	1990-11-11
12	Сидоров	Сидор	М	1990-12-12
13	Сидоров	Сидор	М	1990-01-01
14	Сидоров	Сидор	М	1990-02-02
15	Сидоров	Сидор	М	1990-03-03
16	Сидоров	Сидор	М	1990-04-04
17	Сидоров	Сидор	М	1990-05-05
18	Сидоров	Сидор	М	1990-06-06
19	Сидоров	Сидор	М	1990-07-07
20	Сидоров	Сидор	М	1990-08-08
21	Сидоров	Сидор	М	1990-09-09
22	Сидоров	Сидор	М	1990-10-10
23	Сидоров	Сидор	М	1990-11-11
24	Сидоров	Сидор	М	1990-12-12

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SCHEDULE 3

Project Programme

Part A: Key Programme Dates

Part B: Project Programme

Part A: Key Programme Dates**Piccadilly Line**

Key Programme Dates	
Commencement Date (Milestone 1)	
All Plans and strategies that are required to have been submitted and Approved on or prior to the date stipulated as the Key Programme Date for this Milestone 1a have been submitted and Approved (Milestone 1a)	
Submission of Training Strategy	
Submission of Training Programme	
Submission of Assurance Plan	
Mobilisation and Concept Design Phase Complete (Milestone 2)	
Delivery of Saloon Mock-Up to the Purchaser (in accordance with clause 10.4(e))	
Approval of the Train/ PDP Interface Control Documents for Preliminary Design Phase (Milestone 2a)	
Preliminary Design Phase complete	
Approval of the Train/ PDP Interface Control Documents (Milestone 3)	
Final Design Phase complete (Milestone 3a)	
Draft Manuals submitted by the Manufacturer for Approval	
Commencement of the assembly of the first and second Trains in the Base Order (Milestone 4)	
TCMS Simulator Type Tested and available for use	
Completion of the assembly of the first and second Trains in the Base Order (Milestone 5)	
Pre-Specified Free Issue Materials for the first and second Trains delivered	
OTC – Infrastructure-Borne Equipment deliveries commence	
Maintainability Demonstration Testing carried out at the Manufacturer's Premises complete	
Test Track Facilities available for Test Track Facilities Integration Equipment installation (Milestone 5a)	
Test Track Facilities available for Integration Testing	
Commencement of the assembly of the third Train in the Base Order (Milestone 6)	
Train Maintenance Regime submitted by the Manufacturer for Approval	
Automatic Lineside Inspection Equipment ready for use at the relevant Designated Depot	
Delivery Depot facilities ready for first Train delivery	
Purchaser Depot Works finalisation commences	
First Train Pre-Provisional Acceptance Certificate issued	
First Train delivered to Delivery Depot	
Series Pre-Specified Free Issue Materials delivery commences	
LUL Network Testing commences	
Maintainability Demonstration Testing carried out in the Designated Depot (or other relevant location) complete	
Acceptance of the Train Driving Simulators (Milestone 7)	

Key Programme Dates	
Train Acceptance (Milestone 8) (Multiple Trains)	
Train Number 1	
Train Number 2	
Train Number 3	
Train Number 4	
Train Number 5	
Train Number 6	
Train Number 7	
Train Number 8	
Train Number 9	
Train Number 10	
Train Number 11	
Train Number 12	
Train Number 13	
Train Number 15	
Train Number 16	
Train Number 17	
Train Number 18	
Train Number 19	
Train Number 20	
Train Number 21	
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Train Number 34	
Train Number 35	
Train Number 36	
Train Number 37	
Train Number 38	
Train Number 39	
Train Number 40	
Train Number 41	
Train Number 42	
Train Number 43	

Key Programme Dates	
Train Number 44	
Train Number 45	
Train Number 46	
Train Number 47	
Train Number 48	
Train Number 49	
Train Number 50	
Train Number 51	
Train Number 52	
Train Number 53	
Train Number 54	
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Train Number 78	
Train Number 79	
Train Number 80	
Train Number 81	
Train Number 82	
Train Number 83	
Train Number 84	
Train Number 85	
Train Number 86	
Train Number 87	

Key Programme Dates	
Train Number 88	
Train Number 89	
Train Number 90	
Train Number 91	
Train Number 92	
Train Number 93	
Train Number 94	
Sufficient Base Order Spares, Base Order Non-Standard Tools and Base Order Special Tools that support delivered Trains, (the number and specification of the relevant Base Order Spares and Base Order Special Tools corresponds with that required in schedule 8 (Spares and Special Tools))	
First new Train PAC issued (Milestone 8)	
Second Train Pre-Provisional Acceptance Certificate issued	
Second Train PAC issued (Milestone 8)	
All Trains Acceptance (Milestone 8)	
Final Acceptance	
Fleet Acceptance (Milestone 9)	
Assurance Stages	
Assurance Stage 1 - Design completion	
Assurance Stage 2 - Test Track	

Part B: Project Programme

SCHEDULE 4

Training

1. GENERAL REQUIREMENTS FOR TRAINING

- 1.1 The Manufacturer shall provide, or procure the provision of, training in accordance with this schedule 4 to the breadth and depth required to enable the Purchaser's trainers to acquire all relevant knowledge and skills for the training of end-users of the Trains and Equipment (including operators, maintainers, specialist engineering personnel and ERU personnel).
- 1.2 A "train-the-trainer" approach shall generally be adopted by the Manufacturer. Where, however, the Purchaser deems it more expedient, either in relation to the numbers involved or to any other such consideration, the Manufacturer shall also be required to train any personnel nominated by the Purchaser. Such nominated personnel are likely to include (but not be limited to) users (including operators, maintainers and specialist engineers) of the Trains and Equipment, either in the employment of, or contracted to, the Purchaser.
- 1.3 In relation to the Base Order, each Whole Line Option and each Migration State relevant to the Base Order and each Whole Line Option (including the relevant end state railway in each case), the Manufacturer shall complete predictive task analysis and develop, deliver and evaluate separate training courses in relation to the following activities associated with the Purchased Items:
 - (a) test-train operation;
 - (b) operation (in normal, abnormal, degraded and emergency conditions);
 - (c) maintenance (including vehicle awareness, planned preventative maintenance, corrective maintenance, diagnostic and monitoring activities, fault and failure diagnosis and rectification and overhaul);
 - (d) specialist engineer investigations (including principal specialist engineers and depot specialist engineers); and
 - (e) ERU recovery.
- 1.4 The format of all documentation (provided to support training) shall be proposed by the Manufacturer for Approval by the Purchaser within six (6) months of the relevant Commencement Date.
- 1.5 The introduction of technical enhancements on the Trains and Equipment and/or any other changes introduced, such as those arising from the rectification of Manufacturer defects, shall be analysed by the Manufacturer, in consultation with the Purchaser, to determine whether further training is required. Any such training identified shall fall within the provisions of this Agreement and shall be delivered by the Manufacturer at no additional cost to the Purchaser.
- 1.6 The Manufacturer shall be responsible for the modification of the training approach, materials and resources in consultation with the Purchaser, in light of training pass/fail rates, in-service operations and maintenance experience.
- 1.7 The Manufacturer shall provide sufficient training and documentation to ensure that:
 - (a) those personnel nominated by the Purchaser to attend training acquire all relevant knowledge and skill in relation to the operation of the Trains, Equipment, asset(s) and system(s) being supplied, including all facets relating to the function,

malfunction (including the range and ramification of potential fault and failure conditions), operation and use of the Trains, Equipment, asset(s) and system(s) that are relevant to end-user operators;

- (b) those personnel nominated by the Purchaser to attend training acquire all relevant knowledge and skill in relation to the maintenance of the Trains, Equipment, asset(s) and system(s) being supplied, including all maintenance activities required over the life of the Trains, Equipment, asset(s) and system(s) that are relevant to end-user maintainers. Such activities shall include inspection, preventative maintenance, casualty maintenance, diagnostic and monitoring maintenance activities, fault diagnosis, fault rectification and overhaul;
- (c) those principal specialist engineers nominated by the Purchaser to attend training acquire a detailed understanding of the Train and relevant Equipment systems' design parameters and underpinning rationale, sufficient to enable them to carry out incident investigations and explain why the parameters provided have been chosen and the ramifications of any changes to such parameters;
- (d) depot specialist engineers nominated by the Purchaser to attend training acquire a detailed understanding of the Train and relevant Equipment systems' design parameters and underpinning rationale, sufficient to enable them to undertake incident investigation on the Train and relevant Equipment safety-related systems; and
- (e) ERU personnel nominated by the Purchaser to attend training acquire all relevant knowledge and skill relevant for the recovery of the Trains, Equipment, asset(s) and systems(s) being supplied in the event of degraded or emergency operating conditions (such as in the event of a derailment or collision) including provision of, and training on, an emergency breakdown manual.

1.8 Subject to paragraph 1.9 below, in relation to each Training Course identified for delivery by the Manufacturer, the Manufacturer shall provide training for up to 12 Purchaser nominees in total.

1.9 The number of times each individual Training Course is delivered shall be dependent upon:

- (a) the maximum number of attendees determined by the Training Needs Analysis; and
- (b) the actual number of personnel that the Purchaser elects to attend.

1.10 For the avoidance of doubt:

- (a) and by way of illustration, if the Training Needs Analysis determines that a maximum of four (4) trainees can be accommodated on a particular Training Course, that Training Course will be required to be delivered: (i) once if the Purchaser elects to train four (4) nominees; (ii) twice if the Purchaser elects to train eight (8) nominees; and (iii) three times if the Purchaser elects to train 12 nominees;
- (b) different Purchaser nominees are likely to attend different training modules/courses within a defined subject area, such as fault-finding. For example, while specialist brake maintainers/engineers are likely to attend the brakes fault-finding module/course, other nominees, such as specialist doors maintainers/engineers, are likely to attend the doors fault-finding module/course; and
- (c) if the Purchaser requires more than 12 nominees to be trained, the provisions of paragraph 14 of this schedule 4 shall apply.

- 1.11 The Manufacturer shall, as part of the Training Programme, and for the Purchaser's subsequent use for training, provide all tools and equipment associated with the Trains, Equipment, asset(s) and system(s) for which training is being provided. Title and risk in such tools and equipment shall pass to the Purchaser or, at the Purchaser's discretion, the Owner, from the date of provision by the Manufacturer, and the Manufacturer warrants that such title shall be with full title guarantee and free and clear of all Security Interests.
- 1.12 Training shall be provided in the set-up, use and maintenance of all:
- (a) tools provided to support training;
 - (b) e-learning; and
 - (c) equipment, including diagnostic equipment and off-Train equipment testing and analysis tools.
- 1.13 The training provided by the Manufacturer shall cover the operation and maintenance of the Trains and Equipment under normal, abnormal, degraded and emergency conditions and shall address all normal modes of operation, the symptoms of failure modes, corrective actions to be taken, safety precautions, the level of intervention that is permissible by the Purchaser and the events that would necessitate the Manufacturer's involvement. Such training shall include, but shall not be limited to:
- (a) the location, purpose and function of all systems and components relevant for the following activities associated with the supplied assets(s)/system(s):
 - (i) operation (including operation of a Train during testing, and in normal, abnormal, degraded and emergency conditions);
 - (ii) maintenance;
 - (iii) specialist engineer investigations; and
 - (iv) ERU recovery;
 - (b) the operation and maintenance (including all relevant instructions and processes for operation and maintenance, fault diagnosis, rectification and testing) of the supplied asset(s)/system(s);
 - (c) system interfaces and associated failure modes and effects;
 - (d) calibration, adjustment and use of Special Tools;
 - (e) the asset(s)/system(s) design, performance limits and capability (to ensure that the Purchaser has the capability to undertake specialist engineer investigations); and
 - (f) such other content as the Manufacturer shall propose and the Purchaser agree.
- 1.14 A mix of both traditional and technology-based training approaches shall be provided. The traditional training approach shall include both training-room-based and hands-on practical exposure to the operation and maintenance of the Trains and Equipment. The technology-based training approach shall include Train Driving Simulators (for operational training) and e-learning (for maintenance training).
- 1.15 The Manufacturer shall provide to the Purchaser, and to nominated PDPs as required, all necessary information and support required (including access to technical experts) to develop training (including fault-finding training) in relation to the integrated railway system including the Interfaces referred to in schedule 26 (Systems Integration).

- 1.16 All training shall be provided in accordance with recognised industry practice, including as outlined in the Rail Safety and Standards Board document RS/100, Issue 1, March 2013 – "Good Practice Guide on Competence Development".
- 1.17 All training shall be provided in accordance with the provisions of the Training Philosophy, and the Manufacturer shall otherwise comply with the Training Philosophy.
- 1.18 At all times prior to the conclusion of the Train Warranty Period for the relevant Fleet, the Manufacturer shall ensure that all Training Modules are updated whenever necessary to reflect any modifications to the Train and Equipment Design or the Train operating and maintenance procedures. In particular, all applicable Training Modules shall be adapted in a timely manner on an iterative basis to apply to each Migration State.
- 1.19 Incremental training updates shall be provided by the Manufacturer whenever there are modifications to the Train and Equipment Design affecting any aspect of the operation or maintenance of the asset(s) or system(s) being supplied.
- 1.20 Instruction manuals provided for diagnostic ancillary equipment (such as interface boxes, laptops and required leads) and data analysis software shall be in such form as to permit users to teach themselves the full functionality of the equipment and software.
- 1.21 Without prejudice to the remaining provisions of this Agreement, technical documentation (such as operator and maintainer manuals) shall be developed by the Manufacturer and Approved by the Purchaser in sufficient time to facilitate the timely development and delivery of all training provided or procured by the Manufacturer.
- 1.22 All training shall be accompanied by a full suite of documentation Approved by the Purchaser including:
- (a) without prejudice to clause 6.5, operator and maintainer manuals (including detailed instructions for the operation and maintenance of the Trains and Equipment, including training tools and equipment);
 - (b) the documentation necessary to provide specialist engineers with all necessary information to enable them to carry out incident investigations on the asset(s) and system(s) being supplied;
 - (c) an emergency breakdown manual; and
 - (d) Training Materials including Training Plans, training specifications, detailed trainers' notes, presentation materials (e.g. slides, models etc.), formative and summative assessments and trainee material (including, for example, handbooks).
- 1.23 The Manufacturer shall be responsible for the provision of an adequate number of appropriately skilled trainers to complete all aspects of the analysis, design, development delivery and evaluation of training (including, when required by the Purchaser, competency assessments) to meet the provisions of the Training Programme.
- 1.24 Training delivery venues shall be within the confines of the Purchaser's infrastructure within the geographical area of the LUL Network, unless otherwise agreed between the Parties. Where any training can only reasonably be provided by the Manufacturer at a location outside London, the Purchaser shall meet the subsistence costs of the staff to be trained.
- 1.25 The Manufacturer shall provide information, documentation and support to the Purchaser or its PDPs in relation to the development of training for system interfaces, as reasonably requested by the Purchaser.

- 1.26 In order to facilitate the development of technology based training (such as simulation or computer based training) by the Purchaser or its PDPs, the Manufacturer shall provide all required technical information, including documentation such as illustrations, schematics, display screen captures, training manuals and design information relating to the design parameters, operation and maintenance of the Trains and Equipment.

2. **TRAINING STRATEGY**

- 2.1 The Manufacturer shall, within six (6) months of the Commencement Date, submit to the Purchaser for Approval a training strategy ("**Training Strategy**"), in hard copy and electronic copy form in accordance with the Key Programme Dates.
- 2.2 The Training Strategy shall be developed in accordance with Section 3.1 of the Training Philosophy and the requirements of this schedule 4.
- 2.3 The Training Strategy shall be reviewed by the Manufacturer in conjunction with the Purchaser and shall be maintained and updated by the Manufacturer as and when necessary, or as requested by the Purchaser, until Acceptance of the last Train in each relevant Fleet and re-submitted to the Purchaser for Approval as required.
- 2.4 The Training Strategy submitted by the Manufacturer shall include details of the approach recommended by the Manufacturer for the most appropriate utilisation of technology (including computer-based training, simulation, emulation and augmented reality applications) to support training (for operations, maintenance, ERU personnel and engineering specialists).

3. **TRAINING PROGRAMME**

- 3.1 The Manufacturer shall, within six (6) months of the Commencement Date, submit to the Purchaser for Approval a training programme in hard copy and electronic copy form in accordance with the Key Programme Dates and once such training programme has been Approved by the Purchaser, it shall be the "**Training Programme**" for the purposes of this Agreement.
- 3.2 The Training Programme shall be developed in accordance with Section 3.2 of the Training Philosophy and the requirements of this schedule 4.
- 3.3 The Training Programme shall set out the training that shall be provided by the Manufacturer to enable the Purchaser to train its employees (or those of the Purchaser's nominees) to operate and maintain the Trains and Equipment in accordance with all Applicable Laws and Standards, Relevant Approvals and the Purchaser's Safety Certificate and Certificate of Technical Conformance.
- 3.4 The Training Programme shall accord with the timescales and duration required by this Agreement.
- 3.5 The Training Programme shall detail all training timescales associated with the:
- (a) production of all Training Materials, in accordance with paragraph 7 of this schedule 4;
 - (b) delivery of all training courses and associated assessments to be provided by the Manufacturer; and
 - (c) delivery of all deliverables under this schedule 4.
- 3.6 At a minimum, in the Training Programme, the Manufacturer shall make programme provision in relation to training as follows:

- (a) Training Strategy: preparation; submission to Purchaser; Purchaser review; update and re-submission to Purchaser (if required); Purchaser Approval; regular review (at least annually).
- (b) Training Programme: preparation; submission to Purchaser; Purchaser review; update and re-submission to Purchaser (if required); Purchaser Approval; regular review (at least annually).
- (c) For each Training Course:
 - (i) completion and Manufacturer validation/assurance of Training Needs Analyses (including training task, gap and options analysis);
 - (ii) production of a training specification, including: preparation (incorporating Manufacturer validation/assurance); submission to Purchaser; Purchaser review; update and re-submission to Purchaser (if required to address Purchaser comments); and Purchaser Approval;
 - (iii) production of a training plan, including: preparation (incorporating Manufacturer validation/assurance); submission to Purchaser; Purchaser review; update and re-submission to Purchaser (if required to address Purchaser comments); and Purchaser Approval;
 - (iv) production of technical support documentation, including: operation and maintenance manuals etc.; preparation (incorporating Manufacturer validation/assurance); submission to Purchaser; Purchaser review; update and re-submission to Purchaser (if required to address Purchaser comments); and Purchaser Approval;
 - (v) production of training materials, including: preparation (incorporating Manufacturer validation/assurance); submission to Purchaser; Purchaser review; update (to include provision for joint validation/assurance meetings as required); re-submission to Purchaser; update and re-submission to Purchaser (if required to address Purchaser comments); and Purchaser Approval;
 - (vi) provision of all training tools and equipment required for the training course concerned;
 - (vii) delivery, evaluation and certification of the relevant training (and licensing, if relevant) including provision for required facilities (including access to the Test Track Facilities) and any required competence development and assessment activities;
 - (viii) the lead-times required by the Purchaser's internal training programme for the cascade of the training shall be shown and adequate provision (within the Manufacturer's programme) shall be made to accommodate these; and
 - (ix) training acceptance (as set out in Section 4.7.4 of the Training Philosophy) by the Purchaser upon the successful delivery of the Training Course concerned,

in each case as required by this schedule 4.

- 3.7 The Training Programme shall be reviewed in conjunction with the Purchaser and shall be maintained and updated as and when necessary or as requested by the Purchaser until Acceptance of the last Train in each relevant Fleet or, if later, until the provision of the last training, and re-submitted for Approval to the Purchaser as required.

4. **TRAINING NEEDS ANALYSIS**

- 4.1 Prior to the development of the training specifications referred to in paragraph 5 below, the Manufacturer shall undertake Training Needs Analyses in consultation with the Purchaser in accordance with Section 4.2 of the Training Philosophy.

5. **TRAINING SPECIFICATIONS**

- 5.1 The Manufacturer shall submit a training specification for each Training Course to the Purchaser for Approval prior to the development of the respective Training Materials concerned.
- 5.2 Each training specification shall be provided in accordance with Section 4.4 of the Training Philosophy and the requirements of this schedule 4.

6. **TRAINING DEVELOPMENT**

- 6.1 The Manufacturer shall design and develop the Training Courses in accordance with Sections 4.3 and 4.5 of the Training Philosophy.

7. **TRAINING MATERIALS**

- 7.1 Without prejudice to paragraph 1.7 above, for each Training Course, the Manufacturer shall submit to the Purchaser, Manufacturer validated/assured training materials for Approval no later than 14 months prior to the Contractual Acceptance Date of the first Train. Such materials shall include Manufacturer validated/assured:

- (a) operator and maintainer documentation, including manuals;
- (b) output of training analysis;
- (c) training specifications;
- (d) Training Plans;
- (e) presentation materials;
- (f) detailed trainer's notes;
- (g) trainee materials, including handbooks, fault guides, handouts and other such materials;
- (h) tools and equipment; and
- (i) formative and summative assessments including, for the summative assessments, a matrix that cross-references each learning objective with all related assessment questions,

together the ("**Training Materials**").

- 7.2 The Manufacturer shall develop the Training Materials in accordance with Section 3.4 and Appendix 'B' (Design and Development of E-Learning) of the Training Philosophy and the requirements of this schedule 4.
- 7.3 The Training Materials provided by the Manufacturer shall be of sufficient quality and quantity as are reasonably necessary or desirable to permit the Purchaser's nominated trainers to undertake further training of the Purchaser's employees or those of any nominee.

- 7.4 The Purchaser shall be entitled, without further charge, to duplicate as many copies of the Training Materials and other materials provided as it requires for the purposes of training its employees or those of any nominee.
- 7.5 The Training Materials shall be reviewed in conjunction with the Purchaser and re-submitted for Approval to the Purchaser as required. The Training Materials shall be maintained and updated by the Manufacturer as and when necessary or when requested by the Purchaser, until Acceptance of the last Train in each relevant Fleet, or if later, until the provision of the last item of training.
- 8. E-LEARNING**
- 8.1 The Manufacturer shall develop e-learning material to include an interactive 3-D computer model of the Train that provides contextual links to a description, including the names, location, purpose and function of the Major Components on the Train. Such e-learning material shall be supported by high-definition photographs or graphical representations for each of the Major Components concerned.
- 8.2 The specification of all e-learning content (including scope, target audience, learning aim(s), learning objectives and outline training course and module content, including detailed storyboard) shall be submitted to the Purchaser for Approval in advance of development, in accordance with the timescales sent out in this schedule 4.
- 8.3 The e-learning material supplied shall be developed to provide a simulated, sequential, step-by-step approach for the removal and replacement of Parts and Major Components. Detailed visual representation, including high-definition video, photographs, audio/narrative, HD-graphics as may be agreed by both Parties, shall be provided by the Manufacturer.
- 8.4 For each Major Component on the Train, the Manufacturer shall provide a 'hot-spot' that provides contextual links to the deliverables to be provided by the Manufacturer under paragraph 8.5 below.
- 8.5 For each Major Component on the Train, the Manufacturer shall provide:
- (a) Train maintenance instructions/processes for all activities related to that Major Component;
 - (b) a description of any special tools or equipment required to maintain that Major Component (including its removal, replacement and testing) together with supporting video, photographs and/or HD-graphics demonstrating/illustrating the set-up, fitment and use of any such special tooling/equipment required to maintain that Major Component; and
 - (c) video (including audio and textual narrative) demonstrating the removal, replacement and testing of the Major Components together with any Special Tools required for their maintenance (including the Special Tools or equipment required for such Major Component removal, replacement and testing).
- 8.6 The e-learning material shall be developed in accordance with Appendix 'B' (Design and Development of E-Learning) of the Training Philosophy.
- 8.7 There shall be no restriction as to the number of instances of the e-learning package that the Purchaser may deploy at any one time to facilitate the training of the Purchaser's staff, and the Manufacturer shall not be entitled to charge an additional sum for such deployments.
- 8.8 All CAD modelling and other such files used to develop the e-learning material shall be provided to the Purchaser for use as part of the e-learning deliverable.

9. **TRAINING PLANS**

- 9.1 For each Training Course, the Manufacturer shall submit to the Purchaser a Training Plan (together with all associated Training Materials in accordance with Section 3.3 of the Training Philosophy).
- 9.2 Training Plans shall be developed in accordance with Section 3.3 of the Training Philosophy and the requirements of this schedule 4.
- 9.3 The Purchaser shall be entitled, without further charge, to duplicate as many copies of the Training Plans and other materials provided as it requires for the purposes of training its employees or those of any nominee.
- 9.4 When developing the Training Plans, the Manufacturer shall:
- (a) identify each Training Course where recommended attendance is linked to the prior completion of another Training Course; and
 - (b) limit the number of such dependencies in so far as is reasonably practicable.

10. **TRAINING VALIDATION / APPROVAL**

- 10.1 The Manufacturer shall comply with the provisions of Section 4.6 of the Training Philosophy.
- 10.2 The Manufacturer shall provide to the Purchaser details of the training validation/approval process within six (6) months of the Commencement Date.

11. **TRAINING DELIVERY, COST, EVALUATION AND ACCEPTANCE**

- 11.1 The Manufacturer shall comply with the provisions of Section 4.7 of the Training Philosophy.
- 11.2 Unless otherwise agreed with the Purchaser at the training specifications stage, all training provided by the Manufacturer shall contain formative and summative (immediate outcome level) assessments. Competence assessments shall be provided by the Manufacturer in relation to each of the following activities on the asset(s)/system(s) being supplied:
- (a) test-train operation;
 - (b) planned preventative maintenance;
 - (c) corrective maintenance; and
 - (d) fault and failure diagnosis and rectification maintenance.

In relation to each of the activities detailed above, competence assessments shall be provided by the Manufacturer for up to 12 Purchaser nominees. For the avoidance of doubt, this equates to a maximum of 48 individual Purchaser nominee competence assessments across all four activities. Competence assessments shall be undertaken against applicable standards, such as those associated with a nationally recognised framework (for example, National Vocational Qualifications or their equivalent). The standards against which competence assessments will be carried out shall be agreed with the Purchaser at the training specifications stage. The Manufacturer shall provide to the Purchaser's nominees all required support in relation to the achievement of competence, including task coaching, task shadowing and supervised practice.

11.3 All training shall be subject to Approval by the Purchaser. Once the Purchaser confirms its satisfaction with the:

- (a) final version of the Training Materials (Approved by the Purchaser pursuant to the Approval Process); and
- (b) delivery of the training concerned (to the Purchaser's nominees), including the delivery of training evaluation (in accordance with Section 4.7.3 of the Training Philosophy) and the delivery of the competence assessments referred to in paragraph 11.2 above (as required by the Purchaser),

the training course concerned shall be deemed to have been Approved for the purposes of this Agreement.

11.4 Following Approval of the training by the Purchaser, should any alteration be required to the Training Materials in light of in-service operations and maintenance experience, the Manufacturer shall, under the standard provisions of this Agreement and at no additional cost to the Purchaser, complete any necessary analysis and provide updated training materials for the Approval of the Purchaser. All necessary support shall be provided by the Manufacturer to ensure that the Purchaser's nominees acquire all relevant knowledge and skill associated with the changes concerned.

12. **TRAINING CERTIFICATION AND LICENSING**

12.1 The Manufacturer shall comply with the provisions of Section 3.7 of the Training Philosophy.

13. **TRAINING LOG**

13.1 The Manufacturer shall prepare, submit and maintain a training log in accordance with Section 3.8 of the Training Philosophy.

14. **ADDITIONAL TRAINING**

14.1 At the Purchaser's request and cost, the Manufacturer shall provide training (including all associated documentation) in addition to that required to be provided pursuant to the rest of this schedule 4, and such training shall be provided at a rate of £500 (Indexed) per day or part thereof. For the avoidance of doubt, the Manufacturer shall not be entitled to charge extra for the production of associated documentation.

15. **OPERATOR TRAINING – TEST TRACK FACILITIES**

15.1 The Manufacturer shall make the Test Track Facilities available for those elements of operator training that are required by the Purchaser to be delivered at such Test Track Facilities.

SCHEDULE 5

Contract Management

1. **CONTRACT MANAGERS**

- 1.1 The Purchaser shall appoint a person to be its contract manager and authorise that person to act as the Purchaser's representative for all purposes of this Agreement (the **"Purchaser Contract Manager"**). The Purchaser shall notify the Manufacturer in writing of the Purchaser Contract Manager's appointment or, where appropriate, the revocation of any such appointment. The Manufacturer shall only be bound by such an appointment or revocation of any such appointment of the Purchaser Contract Manager where it has been given the relevant written notice by the Purchaser of such appointment or revocation. The Purchaser shall endeavour to give one (1) month's written notice to the Manufacturer (or such other period as the Purchaser may consider appropriate) of any replacement of the Purchaser Contract Manager. As at the date of this Agreement the Purchaser Contract Manager is [REDACTED].
- 1.2 The Purchaser Contract Manager shall exercise such rights, powers, discretion, functions or options provided for in this Agreement on behalf of the Purchaser and, subject to paragraph 1.1, the Purchaser Contract Manager shall have full authority to act on behalf of the Purchaser for the purposes of this Agreement and the Manufacturer shall in all such matters look to the Purchaser Contract Manager as if such person were the Purchaser.
- 1.3 The Manufacturer shall appoint a person to be its contract manager and authorise that person to act as the Manufacturer's representative for all purposes of this Agreement (the **"Manufacturer Contract Manager"**). The Manufacturer shall notify the Purchaser in writing of the Manufacturer Contract Manager's appointment or, where appropriate, the revocation of any such appointment. The Purchaser shall only be bound by such appointment or revocation of any such appointment of the Manufacturer Contract Manager where it has been given the relevant written notice by the Manufacturer of such appointment or revocation. The Manufacturer shall give one (1) month's written notice to the Purchaser of any replacement of the Manufacturer Contract Manager. As at the date of this Agreement the Manufacturer Contract Manager is [REDACTED].
- 1.4 The Manufacturer Contract Manager shall exercise such rights, powers, discretion, functions or options provided for in this Agreement on behalf of the Manufacturer and, subject to paragraph 1.3, the Manufacturer Contract Manager shall have full authority to act on behalf of the Manufacturer for the purposes of this Agreement and the Purchaser shall in all such matters look to the Manufacturer Contract Manager as if such person were the Manufacturer.
- 1.5 Save as provided in paragraph 1.2, any instruction, direction or other act of the Purchaser Contract Manager shall bind the Purchaser and save as provided in paragraph 1.4, any instruction, direction or other act of the Manufacturer Contract Manager shall bind the Manufacturer.

2. **AUTHORISATION**

- 2.1 Each Contract Manager may from time to time as he sees fit authorise an assistant or agent to exercise any of the powers, rights, discretion, options and/or functions vested in him and such authorised functions carried out by such assistant or agent shall bind the Purchaser or the Manufacturer (as the case may be) (**"Authorisation"**). Each Contract Manager may at any time revoke any such Authorisation (**"Revocation"**). Any such Authorisation or Revocation shall be in writing signed by the relevant Contract Manager and shall state which rights, powers, discretion, options or functions are thereby Authorised or Revoked respectively. Each such Authorisation or Revocation by a Contract

Manager shall take effect upon the other Party being given written notice of such Authorisation or Revocation.

- 2.2 The terms of such written Authorisation or Revocation shall be conclusive and the other Party shall have no claim if it relies on communication from any person other than the Contract Manager in the absence of such written Authorisation or disregarding such written Revocation (as the case may be).
- 2.3 If at any time either Party receives what it considers (acting reasonably) to be conflicting communications from the other Party, clarification should be sought from the relevant Contract Manager whose written determination shall be issued within seven (7) Working Days and shall be conclusive as to the Authorisation.

3. **ORGANISATIONAL ARRANGEMENTS**

- 3.1 The Manufacturer's internal organisational arrangements for the management of the Works (including names of Key Posts (set out in Appendix 1), reporting lines and organisation charts) shall be as set out in the Project Execution Plan.
- 3.2 The Manufacturer shall ensure that the holders of Key Posts are appropriately qualified, experienced and available as necessary to undertake their duties under this Agreement. In particular, the holders of Key Posts shall have an appropriate mixture of the following attributes to support delivery of the Works:
- (a) leadership skills;
 - (b) relevant experience (such as working with relevant stakeholders, relevant standards, relevant planning regimes and London Underground or equivalent metro railways; and
 - (c) proficiency in business and technical English sufficient to undertake their duties.
- 3.3 The Key Posts shall be those roles specified in Appendix 1 (Key Posts) to this schedule 5 and any additional roles that the Purchaser may add from time to time. One person may undertake more than one Key Post if approved by the Purchaser.
- 3.4 On and from the Commencement Date, the identity of the person undertaking each Key Post shall be as set out opposite such Key Post in the table in Appendix 1 (Key Posts) to this schedule 5. The Manufacturer shall only make changes to the identity of the Key Posts with the prior written approval of the Purchaser and shall provide curriculum vitae for candidates proposed for Key Posts and all additional relevant information that the Purchaser may reasonably request in order to grant such approval.
- 3.5 The Manufacturer shall procure that on and from the Commencement Date, the Service Provider has appointed the FSA Key Posts as required under the Fleet Support Agreement.
- 3.6 The Purchaser shall have the right, acting reasonably, to instruct that the Manufacturer remove and replace with an alternative candidate any person carrying out a Key Post and the Manufacturer shall, as soon as practicable, comply with such instructions.

4. **SENIOR MANAGERS REVIEW MEETINGS**

- 4.1 Every quarter from the Commencement Date, the Parties shall hold a meeting (the "**Senior Managers Review Meeting**") to review the progress of the Works and the Manufacturer's performance of its obligations under this Agreement. The Purchaser shall be entitled to call a Senior Managers Review Meeting more frequently if required. The Senior Managers Review Meeting shall continue to meet every quarter until such time as the Purchaser instructs otherwise.

- 4.2 The Parties shall each provide a senior representative to attend the Senior Managers Review Meeting (of a more senior position than the respective Contract Manager), along with each Contract Manager. The senior representative shall be an appropriate director of the Party in each case.
- 4.3 The Parties may each invite other representatives of their organisations, subcontractors and third parties to attend the Senior Managers Review Meeting to the extent reasonably necessary to discuss specific agenda items. The Purchaser may request that specified representatives of the Manufacturer or any of its Subcontractors attend the meeting, and the Manufacturer shall ensure that, provided that the Purchaser has given at least five (5) Working Days' notice of its request, those representatives do attend that meeting.
- 4.4 The Manufacturer shall provide to the Purchaser any agenda items for discussion at the Senior Managers Review Meeting at least five (5) Working Days prior to the meeting, accompanied by a paper summarising the issues to be discussed. The Purchaser shall prepare and distribute an agenda and papers in advance of the meeting including any issues the Purchaser wishes to discuss together with details of the location for such meeting. The agenda at each meeting shall also include a discussion of any current Disputes, but this shall be without prejudice to any ongoing formal dispute proceedings.
- 4.5 The Purchaser shall take minutes at each Senior Managers Review Meeting and circulate copies of the minutes to the Manufacturer for agreement. Once agreed by the Parties, these minutes shall form a full and accurate record of the meeting.

5. **COMMUNICATIONS, DOCUMENT CONTROL AND DOCUMENT MANAGEMENT**

5.1 **Communications**

- (a) The Manufacturer shall use such electronic document management systems for written communications as shall be specified by the Purchaser from time to time in respect of the communications taking place during the term of this Agreement.
- (b) The Contract Managers shall nominate users for these systems in each case and each Contract Manager shall notify the other Contract Manager of any changes necessary to user accounts and shall co-operate to prevent the misuse of these systems.

5.2 **Document Control**

- (a) Unless instructed otherwise by the Purchaser, the Manufacturer shall submit all written documents (including Technical Documents, programmes and drawings) to be provided pursuant to this Agreement to the Purchaser:
 - (i) in good English;
 - (ii) in electronic form;
 - (iii) in industry standard formats which are accessible using standard tablet devices and PCs, and unless agreed in advance by the Purchaser shall be compatible with PDF and common Microsoft Office formats;
 - (iv) in a format capable of being printed by the Purchaser and be legible when printed on sheets no larger than A3 or equivalent ISO standard A-size paper;
 - (v) of good legible quality;
 - (vi) where required by the Purchaser, in an editable form;

- (vii) where applicable, incorporating definitions, a graphic scale, and/or any other appropriate guide for interpretation; and
- (viii) under cover of a document transmittal in a format to be specified by the Purchaser.
- (b) The Manufacturer shall submit all programmes (including the Project Programme) to the Purchaser in Primavera or in such other form as the Purchaser may specify from time to time.
- (c) The Purchaser may request that any written document shall be submitted in hard copy as well as in electronic form.
- (d) Unless otherwise agreed with the Purchaser, each communication shall cover one subject only, and shall bear an individual sequential number in accordance with the system to be prescribed by the Purchaser.
- (e) The Purchaser shall prescribe a coding protocol in respect of correspondence which shall be adopted by the Parties.
- (f) All correspondence between the Manufacturer on the one hand and other parties appointed or under the control of the Purchaser (including PDPs) or any member of the TfL Group on the other relating or linked to this Agreement or the subject matter of this Agreement, shall be made through the Purchaser Contract Manager, except where the Purchaser Contract Manager directs that contact should be direct with such parties provided that in such cases, copies of correspondence and details of liaison are provided to the Purchaser Contract Manager by the Manufacturer as soon as reasonably practicable after such contact.

5.3 Document Management

- (a) The Manufacturer shall establish a document management system which shall contain all of the documents about the Train and Equipment used in the execution of the Works.
- (b) The documents in the document management system shall be available to the Purchaser to assist the Purchaser in carrying out reviews, audits and Approval of the Manufacturer's documents.
- (c) The content of the documentation shall be regularly reviewed and updated to reflect:
 - (i) any changes to the Trains or Equipment;
 - (ii) any changes to the maintenance process; and/or
 - (iii) significant changes to the duty cycle and operating interfaces.
- (d) The Manufacturer shall be responsible for training its staff and following the document management procedures prescribed by the Purchaser.
- (e) All documentation shall be version controlled.
- (f) All documentation shall be indexed in a useable and accessible format.

5.4 Design Submissions

Without prejudice to the Manufacturer's obligations under this schedule 5 and schedule 17 (Design Management), the Manufacturer shall supply each submission to be provided

pursuant to this Agreement to the Purchaser in a form that is compatible with standard commercially available software and which therefore will enable the information and/or evidence produced by the Manufacturer in its submissions to be used and edited by the Purchaser. The Manufacturer shall fully co-operate with the Purchaser to mitigate any incompatibility between the Purchaser's and the Manufacturer's respective systems.

6. **PROJECT PROGRAMME**

6.1 **Project Programme Requirements**

(a) **Project Programme**

- (i) Primavera shall be the tool for the production of the Project Programme. The Project Programme shall be planned, progressed and analysed using Primavera, and shall clearly identify the start and finish dates and the critical path for the Works up to and including Fleet Acceptance. Interfaces with other parties, including but not limited to PDPs and/or NR shall also be shown clearly on the Project Programme.
- (ii) The Project Programme must contain all of the Manufacturer's obligations relating to the Works and must include the Key Programme Dates.
- (iii) The project structure in the Project Programme (Work Breakdown Structure ("**WBS**")/Cost Breakdown Structure ("**CBS**") shall be Approved by the Purchaser.
- (iv) The Project Programme shall be fully cost and resource loaded in line with the Contract Price and project structure.
- (v) Scarce or specialist resources must be identified and Approved by the Purchaser and coded within the Project Programme. Time phased resource usage and forecast profiling must be undertaken and presented as part of the Project Review Meetings referred to in paragraph 8 of this schedule 5.
- (vi) Purchaser dependencies and activities must be identified and Approved by the Purchaser and coded within the Project Programme.
- (vii) In accordance with schedule 7 (Testing and Inspection), once the Manufacturer has secured access rights for carrying out testing, The Manufacturer's requirements and process for access to the Purchaser or third party infrastructure pursuant to clause 15 (Acceptance of Trains and Equipment) and schedule 7 (Testing and Inspection) (for example, in relation to engineering hours) shall be identified and coded within the Project Programme, and all relevant enabling works shall be logic linked to their associated access activity.
- (viii) Pursuant to the Training Programme and schedule 4 (Training), the Manufacturer shall, within the Project Programme, identify, and make adequate provision for, the Purchaser's requirements in relation to the analysis, design, development, delivery and evaluation of training.
- (ix) Any activity that is deemed to have an impact on the operation of the LUL Network must be identified and coded so that an impact assessment can be undertaken and necessary actions derived.
- (x) Any changes to the Project Programme shall require the Approval of the Purchaser.

(b) **Project Programme Quality**

- (i) The level of detail held in the Project Programme must be fit for purpose and sufficient to manage the Project, but not so detailed that updating, forecasting and communicating could become problematic.
 - (ii) "Acumen Fuse" software measures Project Programme quality against an industry benchmark. The Project Programme must achieve an Acumen Fuse Index score of at least 75 per cent and the Project Programme submitted by the Manufacturer shall include a copy of the Acumen Fuse quality report for that Project Programme. The precise configuration of Acumen Fuse to be used will be specified by the Purchaser.
 - (iii) The Project Programme must be capable of running Earned Value. Physical percentage complete must be based on units and volumes where possible, and activity rate of progress (percentage complete) must align with the activity forecast completion dates (unless agreed otherwise with the Purchaser). Earned Value will not be measured against level of effort costs such as project management and support as they can undermine the usefulness of EVM.
 - (iv) Activity descriptions within the Project Programme should not be generic (i.e. not rely solely on the WBS for their context).
 - (v) All Purchaser dependencies should have 'TFL' as the first 3 characters of their activity ID, in addition to being coded as Purchaser dependencies.
 - (vi) Actual costs for the purpose of Earned Value Management ("**EVM**") and financial forecasting shall be captured within the schedule using WBS summary bars.
 - (vii) Planned work should be routinely reforecast based on actual performance achieved and available resources.
- (c) **Risk**
- (i) Adequate time risk provision must be discretely identified against the relevant activities within the Project Programme.
 - (ii) Project risks identified in the Manufacturer's risk register shall, where possible, be linked to the corresponding activity within the Project Programme (with the associated time and cost assumption). Within the Manufacturer's risk register a unique identifier code shall be used against each risk to enable direct mapping to the relevant activity within the Project Programme. Ideally this would take the form of the Project ID linked with the Activity ID.
- (d) **Project Programme Progress**
- (i) The Project Programme progress and update cycle will be aligned with the Purchaser's reporting process and subsequent progress accruals or assumed progress will be highlighted (i.e. updated to include the last week of the previous period in addition to 3 weeks of actual progress in the period supplemented with 1 week of assumed progress).
 - (ii) The Project Programme shall use Tfl standard calendars. Any need for Manufacturer specific calendars shall be Approved by the Purchaser.
 - (iii) Work package specific performance metrics shall be used to inform Project Programme progress, and shall be Approved by the Purchaser.

- (iv) Progress methodology for all Project Programme activities shall be documented and Approved by the Purchaser.
- (e) **Required Supplementary Project Programme Related Data**
 - (i) Planning assumptions must be documented and subsequent changes noted and reviewed at the Project Review Meetings referred to in paragraph 8 of this schedule 5 in order to ensure robust forecasting. Scheduling assumptions likely to have an impact on project delivery must be entered into the risk register and then subject to impact assessment through quantitative schedule risk assessment.
 - (ii) The Project Programme and Key Programme Dates shall be recognised as the Contract Baseline.
- (f) The Project Programme shall include activity descriptions which describe which work is to be carried out and where and use of the Primavera Log for additional descriptive information, as required.
- (g) No more than 25 per cent of the activities that constitute the controlling operations or critical path shall be critical (critical activities being defined as float in the range of one to ten (10) Working Days).

6.2 Contents of Project Programme

Without prejudice to the Train Technical Requirements and paragraph 6.1, the Manufacturer shall, within three (3) months from the Commencement Date, provide the Purchaser with an updated Project Programme. The updated Project Programme shall include, as a minimum, start and finish dates and dependencies for each of the following which shall reflect and be consistent with the other requirements of this Agreement:

- (a) in respect of the Trains:
 - (i) each stage and stage gate review within the "V" life-cycle model as referred to in schedule 6 (Assurance) and paragraph 3 (Engineering "V" Life Cycle) of schedule 17 (Design Management), that will be applied for the development and design of each Subsystem;
 - (ii) the design review process for each Subsystem and each design review stage;
 - (iii) the delivery of each Design Submission in accordance with the Design Management Plan;
 - (iv) handover/exchange/review of Interface Control Documents with other PDPs to the Purchaser in accordance with schedule 26 (Systems Integration);
 - (v) the procurement of contracts for the supply of all Major Components and Parts for each Subsystem;
 - (vi) supply of Free Issue Materials, Pre-Specified Free Issue Materials and third party provided equipment;
 - (vii) the manufacture of each Train, including each stage of production for each car forming part of that Train;
 - (viii) setting up of the Test Track Facilities, any enabling works required for the integration testing and Test Track Facilities, and delivery of and setting up of the Test Track Facilities Integration Equipment;

- (ix) Type Testing, including static type testing, testing, rig testing, equipment testing, testing on the Test Track Facilities and LUL Network Testing, Routine tests of the Trains, testing of all Major Components and in each case detailed by test and in accordance with the Testing and Inspection Programme;
- (x) all Relevant Approvals as required by this Agreement;
- (xi) the provision of the Saloon Mock-up and any other mock-ups and the dates for each of the processes associated with the development of each mock-up including inspections and approvals and delivery to the Purchaser for customer acceptance tests;
- (xii) inspections of each Train (detailed by each inspection and Train);
- (xiii) the certification by the Manufacturer and external body certification (detailed by item) where relevant;
- (xiv) the delivery and commissioning of each Train;
- (xv) achievement of each Acceptance stage for each Train; and
- (xvi) the start and finish dates and the critical path for each relevant stage to Fleet Acceptance;
- (b) in respect of the Manuals, each stage of the development, review and production of the Manuals;
- (c) in respect of each item of Equipment, other than the Train Driving Simulators, each stage in the development, design, manufacture, testing, delivery of such item of Equipment, and achievement of Equipment Acceptance for each such item of Equipment;
- (d) in respect of a Train Driving Simulator, each stage in the development, design, manufacture, procurement, testing, delivery, installation and commissioning of that Train Driving Simulator;
- (e) the provision of the Base Order Spares, Base Order Special Tools, WLO Spares and WLO Special Tools and dates for delivery of tranches of each;
- (f) the provision of training in accordance with clause 12 (Training Services) of this Agreement;
- (g) the information, approvals, and/or other inputs that will be required by the Manufacturer from the Purchaser, Competent Authorities and/or other third parties;
- (h) the scheduled Milestone Payments as set out in schedule 10 (Milestones and Security);
- (i) the maintainability demonstrations referred to in schedule 7 (Testing and Inspection) and schedule 17 (Design Management);
- (j) all other Plans and other strategies that are applicable that the Manufacturer is required to submit in accordance with this Agreement; and
- (k) all Technical Documents that the Manufacturer is obliged to provide and keep up to date.

6.3 Additional Detail

On request by the Purchaser, the Manufacturer shall provide any additional detail, dates or individual programmes relating to a particular aspect of the Project Programme.

6.4 **No Changes**

The Project Programme or Key Programme Dates shall not be changed without the Purchaser's prior written consent or in accordance with a Change Confirmation Notice.

7. **PROJECT PROGRESS REPORTS**

7.1 **Project Progress Reports – General Requirements**

- (a) In each TfL Period, the Manufacturer shall issue a report to the Purchaser by 12 noon on the third Friday of each TfL Period. The report shall be in hard copy and electronic format showing (i) actual progress by the Manufacturer for the first three (3) weeks of that TfL Period and the last week of the previous TfL Period; and (ii) a forecast of the progress in the fourth week of the that TfL Period and the next TfL Period in connection with the Works and in satisfying the Assurance Regime and each of the other requirements specified in this Agreement (the **"Project Progress Report"**).
- (b) The first Project Progress Report shall be produced during the first whole TfL Period to occur after the Commencement Date and shall continue to be produced by the Manufacturer and submitted to the Purchaser in accordance with paragraph 7.1(a) until all activities shown in the Project Programme and Key Programme Dates are complete, or until the end of the Train Warranty Period, whichever is the later.
- (c) The Manufacturer shall ensure that each Project Progress Report continues to clearly identify the start and finish dates and the critical path for the design, manufacture, testing, commissioning and supply of the Trains and Equipment and without prejudice to the foregoing, the matters set out in paragraph 6.2 of this schedule 5.
- (d) Where a Project Progress Report shows a delay, a potential delay or any other problem against the Project Programme and/or Key Programme Dates or any change in the dependencies associated with the Project Programme and/or Key Programme Dates, the Manufacturer shall provide the Purchaser with a report (the **"Exception Report"**), which shall include, the following:
 - (i) the extent of the delay or the potential delay, other problem and/or change and the potential impact on the Project Programme and/or Key Programme Dates;
 - (ii) the reason for the delay or the potential delay, other problem and/or change;
 - (iii) the mitigation measures that the Manufacturer has taken or proposes to undertake to reduce the impact of the delay or the potential delay, other problem and/or change; and
 - (iv) the measures taken, and the measures proposed, to prevent recurrence of the event which caused the delay or the potential delay, other problem and/or change and/or similar such events in the future.
- (e) The Manufacturer shall include a commentary (including variance analysis) in the Exception Report for any delayed tasks which are not on the critical path, but which have any potential to become a factor in timescales specified in the Project Programme and/or Key Programme Dates.

- (f) The Manufacturer shall provide a quality report by reference to the Quality Management Plan in accordance with paragraph 10 of this schedule 5;
- (g) The Manufacturer shall provide a risk management report ("**Risk Management Report**") by reference to the Risk Management Plan reporting on actual performance for that TfL Period since the submission of the Risk Management Report relating to the preceding TfL Period.
- (h) The Manufacturer shall provide a report on health, safety and environmental matters in accordance with schedule 16 (Health, Safety and Environment).
- (i) The Manufacturer acknowledges and agrees that no Project Progress Report or any other provision in this paragraph 7.1 shall:
 - (i) constitute a Change under the Change Procedure; or
 - (ii) constitute a claim for or entitle the Manufacturer to an extension of time to the Contractual Acceptance Date or otherwise entitle the Manufacturer to any adjustment to the Project Programme and/or Key Programme Dates.

7.2 **Content of Project Progress Report**

Each Project Progress Report shall contain the information described in this paragraph 7.2. The Project Progress Report shall include:

- (a) the general requirements set out in paragraph 7.1;
- (b) a confirmation that the design, procurement, manufacture, testing, commissioning, interface management and supply of the Trains and Equipment and related training is proceeding in accordance with the Project Programme and Key Programme Dates, including the process for obtaining Relevant Approvals (other than as disclosed in the Exception Report);
- (c) the Risk Management Report;
- (d) the physical status of each Train in respect of the design, manufacture, testing, commissioning and supply stages and details of any Modifications;
- (e) a report on the performance and reliability of the in-service Trains;
- (f) subject to any obligations of confidentiality to which the Manufacturer is subject, a section highlighting any defects or design, maintenance or operational issues that have arisen in any rolling stock supplied under this Agreement or analogous rolling stock manufactured (or being manufactured) by the Manufacturer or in any rolling stock of which it has knowledge, that may occur or otherwise affect the Trains;
- (g) a description of the type and quantity of Base Order Spares and Base Order Special Tools that have been delivered to the Manufacturer since the previous Project Progress Report including, to the extent applicable, the part numbers of such Base Order Spares and Base Order Special Tools;
- (h) a report on the replenishment or Reconditioning of Base Order Spares that the Manufacturer has carried out since the previous Project Progress Report;
- (i) a cumulative list of each of the Base Order Spares and Base Order Special Tools (and in each case their respective part numbers) that are in the possession of the Manufacturer as at the date of the Project Progress Report;

- (j) progress with the submissions of all plans, strategies, programmes and procedures required by this Agreement; and
- (k) Assurance progress pursuant to schedule 6 (Assurance).

7.3 Where a Base Order Option or WLO Additional Trains Change has been exercised, Project Progress Reports will be structured, as the case may be, to provide all of the requirements set out in paragraph 7 separately in respect of that Base Order Option or WLO Additional Trains Change.

7.4 **Additional Reports**

Without prejudice to the foregoing, the Purchaser shall have the right, acting reasonably, to request additional management reports from the Manufacturer setting out specific details in relation to the Works. The Manufacturer shall provide any such additional report to the Purchaser as soon as reasonably practicable.

8. **PROJECT REVIEW MEETINGS**

8.1 **Project Review Meetings**

- (a) The Parties shall hold a review meeting in relation to the Project Progress Report and related matters once every TfL Period on a date specified by the Purchaser or more frequently upon the request of either Party (the "**Project Review Meeting**").
- (b) The Purchaser shall circulate an agenda prior to each Project Review Meeting, and the Manufacturer shall be entitled to call for the addition of agenda items before or at the commencement of the Project Review Meeting. The agenda circulated prior to each Project Review Meeting shall include specific matters to include, inter alia, those items listed in paragraph 7.2.
- (c) The primary purpose of the Project Review Meeting shall be to:
 - (i) monitor the Manufacturer's performance against the requirements of this Agreement;
 - (ii) monitor the activities at the interface between the Manufacturer, the Purchaser, PDPs, and between the other suppliers of systems to the Purchaser that interface with the Trains and Equipment in accordance with schedule 26 (Systems Integration); and
 - (iii) provide a focal point for the resolution of any problems or issues.

8.2 The Project Review Meeting shall achieve the purposes specified in paragraph 8.1(c) by:

- (a) reviewing the Project Progress Report and referring to the Project Execution Plan in order to:
 - (i) compare activity progress against the Project Programme and Key Programme Dates and discuss any variances;
 - (ii) determine whether any further remedial or mitigation actions are needed to correct variances; and
 - (iii) ensure that appropriate responsibility for actions is agreed;
- (b) reviewing relationships with PDPs to identify any issue arising at the interfaces;

- (c) reviewing quality, safety and technical matters to ensure that the Trains and Equipment will comply with this Agreement;
- (d) reviewing the status of any Changes;
- (e) identifying matters which could potentially affect either Party's performance of its obligations under this Agreement; and
- (f) identifying any major concerns regardless of source and ensuring that appropriate actions are agreed to facilitate resolution of such concerns.

8.3 Each Project Review Meeting shall take place at the Purchaser's offices or such other place as specified by the Purchaser, in each case with reasonable notice to the Manufacturer in advance of the relevant Project Review Meeting.

8.4 The Purchaser Contract Manager and the Manufacturer Contract Manager shall both attend the Project Review Meeting unless otherwise agreed by the Parties. Other employees, agents and/or contractors of each Party including Key Subcontractors and other employees, agents and/or contractors of the TfL Group may attend a Project Review Meeting. The Purchaser has the right to require the attendance of any relevant Subcontractor of the Manufacturer at a Project Review Meeting.

8.5 The Parties shall maintain an open and co-operative relationship in order to promote the success of the Project Programme and Key Programme Dates and delivery of the Works.

8.6 The Purchaser shall chair the Project Review Meeting and shall produce and circulate the minutes promptly after the completion of each Project Review Meeting.

8.7 **Subcontractor Meetings and Demonstrations**

The Manufacturer shall advise the Purchaser of any meetings and/or demonstrations between itself, Subcontractors and/or any Competent Authority concerning the subject matter of this Agreement. The Purchaser or its nominee reserves the right to attend any or all such meetings and/or demonstrations, to the extent reasonably necessary (such right is not, for the avoidance of doubt, to include meetings between the Manufacturer and its Subcontractors relating to their commercial relationship).

8.8 **Liaison Meetings**

The Manufacturer shall, from time to time, attend additional liaison meetings as required by the Purchaser, as part of a process of assuring the Purchaser that the obligations of the Manufacturer under this Agreement are being achieved. Such meetings are expected to be held with, inter alia, stakeholders and are expected to cover design, manufacture, statutory body approval, testing and commissioning of the Trains and Equipment and the introduction of Trains into service.

8.9 **Testing Progress Meetings**

The Parties shall hold a testing progress meeting once every TfL Period on a date specified by the Purchaser or more frequently upon the request of either Party, as part of a process of assuring the Purchaser that the obligations of the Manufacturer in relation to testing pursuant to this Agreement are being achieved.

9. **PLANS FOR DELIVERING THE WORKS**

9.1 Without prejudice to the provisions of schedule 26 (Systems Integration), the Manufacturer shall document its plans for delivering the Works including but not limited to:

- (a) a project execution plan, detailing how the Manufacturer will manage its performance of the Works, and setting out the Manufacturer's management structure accountable and responsible for delivering all facets of the Works, including the proposed names of Key Post holders and their curricula vitae ("**Project Execution Plan**"). The management structure shall include the key interfaces with, inter alia, the Purchaser, Network Rail (where relevant), regulatory and approving bodies and other stakeholders, Key Subcontractors, PDPs and interfacing suppliers;
- (b) a Manufacturer supplier management plan, showing how the Manufacturer will supervise and manage Subcontractors, and in particular Key Subcontractors, during the design, manufacturing and testing stages ("**Manufacturer Supplier Management Plan**");
- (c) its plan for quality management in respect of the Works (the "**Quality Management Plan**"), including the requirements set out in paragraph 10 of this schedule 5 and how the Manufacturer's procedures as set out in the Quality Management Plan will be applied to each stage of the Works and harmonised across multiple design, manufacturing and testing sites, where applicable;
- (d) a design management plan ("**Design Management Plan**"), updated in accordance with paragraph 2 of schedule 17 (Design Management);
- (e) a manufacturing management plan detailing how the Manufacturer will mobilise and organise sufficient appropriately qualified and experienced staff and suitable facilities of the required capacity for the manufacture of the Trains and Equipment. The Manufacturer shall state the principal locations where Train manufacturing (including the Manufacturer's Premises) will take place ("**Manufacturing Management Plan**"). The Manufacturing Management Plan shall clearly describe when, and at which location, cars will be brought together to form Trains;
- (f) an assurance plan detailing how the Manufacturer will implement procedures that will progressively assure the Purchaser that the Works are delivered in compliance with the requirements of this Agreement (the "**Assurance Plan**"), and including the technical assurance requirements of, and the programme for and processes to be used to manage Assurance Submissions in accordance with, schedule 6 (Assurance);
- (g) a risk management plan detailing the identification and mitigation of technical and commercial project risks during the Project Programme ("**Risk Management Plan**"). Changes to the Risk Management Plan shall only be made with the Approval of the Purchaser, and reporting of risks in relation to the Risk Management Plan shall be in accordance with the Risk Management Report referred to in paragraph 7.1(g) of this schedule 5; and
- (h) an information modelling and management execution plan showing how the Manufacturer will establish, implement and maintain a common data environment consistent with the requirements of this Agreement and the Purchaser's Standard Method and Procedure for DTUP included in Appendix 3 to this schedule 5 ("**Information Modelling and Management Execution Plan**"). The information Modelling and Management Execution Plan shall be submitted no later than six (6) months after the Commencement Date. The Purchaser shall provide the solution for the common data environment requirements to establish, maintain and share project data. All agreed common data environment changes will be notified to the Purchaser and changes to the Information Modelling and Management and Execution Plan shall only be made with the Approval of the Purchaser; and

- (i) a master information delivery management plan that records all product items including all Model Files, Composite Models, Non-Graphical Data, Document Definitions and Document Renditions which have been agreed to be produced, maintained, updated and delivered as Production Information and Handover Information, that will be updated and maintained (as required) throughout the Works following project change control procedures ("**Master Information Delivery Plan**"). The Manufacturer shall fully populate and submit the Master Information Delivery Plan to the Purchaser for Approval no later than six (6) months after the Commencement Date using the Purchaser Template included in Appendix 4 to this schedule 5.

9.2 The Manufacturer shall submit the plans listed in paragraph 9.1 above to the Purchaser, unless a different time frame is stated in relation to the relevant plan, no later than one (1) month after the Commencement Date, and shall promptly update and re-issue to the Purchaser in the event of any amendments to such plans.

10. **QUALITY MANAGEMENT PLAN**

10.1 The Quality Management Plan shall include, but not be limited to, the Manufacturer's:

- (a) quality policy;
- (b) defined product quality objectives;
- (c) quality management organisation;
- (d) quality management systems for, inter alia:
 - (i) project and programme/schedule management;
 - (ii) design;
 - (iii) manufacture;
 - (iv) testing;
 - (v) delivery of the Purchased Items;
 - (vi) management of change and non-conformities; and
 - (vii) project reporting;
- (e) information technology and document control and retention procedures;
- (f) process for the selection of Subcontractors;
- (g) process for the surveillance and verification of Subcontractor performance;
- (h) quality performance indicators;
- (i) quality system review process;
- (j) continuous improvement process;
- (k) inspection and quality control processes (including Subcontractors);
- (l) internal auditing requirements and methods;
- (m) Subcontractor auditing requirements and methods;

- (n) non-conformance and corrective action processes;
 - (o) risk management processes;
 - (p) customer complaints handling process; and
 - (q) other applicable quality procedures and all other relevant quality matters envisaged by this Agreement.
- 10.2 The quality management systems referred to in paragraph 10.1(d) above shall be certified to ISO 9001 (or equivalent) and the Manufacturer shall provide supporting evidence satisfactory to the Purchaser of such certification.
- 10.3 The Manufacturer shall ensure that the Quality Management Plan requirements are incorporated throughout the Manufacturer's supply chain.
- 10.4 Without prejudice to clause 43.1, the Manufacturer shall be required to produce and maintain a controlled register of Subcontractors to the satisfaction of the Purchaser. The register shall state the name of the Subcontractor, scope of supply including design responsibility, technical standards, method of quality control and certification to be generated.
- 10.5 Without prejudice to clause 43.1, the Manufacturer shall retain full responsibility for all work performed by Subcontractors regardless of any nominations, instructions, approvals or acceptance granted to the Subcontractors by the Purchaser under this Agreement or any other contract.
- 10.6 The Manufacturer shall carry out reviews of all designs undertaken by Subcontractors. The design documentation produced by a Subcontractor shall be endorsed by the Manufacturer to demonstrate that the Manufacturer accepts the design. The endorsement shall be made by dated signature on the document or on a covering document, if appropriate. The Manufacturer shall maintain a list of persons who are authorised to endorse documents from Subcontractors.
- 10.7 The Manufacturer shall have in place a documented process for the surveillance of Subcontractors in order to mitigate the risk of poor quality not being detected and corrected at the start of the manufacturing and assembly process. This surveillance process shall:
- (a) be a documented procedure for the inspection and testing of a representative sample of products received from Subcontractors. This inspection shall ensure that delivered products comply with specified requirements in all respects and that they have not been damaged or adversely affected during transit;
 - (b) be carried out on a statistically representative sample size which the Purchaser may increase for safety critical components or where problems have been previously found and/or decreased by the Purchaser where supplier quality confidence is higher;
 - (c) include goods inwards inspection and testing and be supported by on-going robust quality product audits and inspections; and
 - (d) include consumable items in routine use such as fasteners/adhesives where incorrect material grades/properties are not immediately apparent to the user but may have safety/quality implications if the incorrect grade/specification is used.

11. TECHNICAL CHANGE CONTROL

- 11.1 Subject to schedule 12 (Change Procedure), the Manufacturer shall establish and implement a technical change control process ("**Technical Change Control Process**") that is consistent with the Change Procedure. The Technical Change Control Process shall enable the Manufacturer to manage, in a structured manner, any change to the scope, function, timeframes, cost and/or any technical aspect of the Trains or any item of Equipment as a result of a change or otherwise and to identify whether any change is a Manufacturer Change or Purchaser Change. The Design Management Plan shall describe the Technical Change Control Process to be implemented by the Manufacturer.
- 11.2 Where a document, drawing and/or other information that has been granted Approval requires amendment in connection with a Change or other requirement of this Agreement, including changes to suppliers of critical risk components, the Manufacturer shall make such amendments as it considers necessary and submit the amended drawing, document and/or information to the Purchaser for Approval.
- 11.3 The Manufacturer will control and document the review, approval and implementation of all Train and Equipment Design changes through the use of an auditable change control system which will undertake and record the formal review of each change and identify:
- (a) potential impacts in other areas of the Train and Equipment Design and to ensure compatibility; and
 - (b) the means by which the Purchaser can manage the configuration of the relevant Fleet and Technical Documents during all stages of the product life cycle.

12. CONFIGURATION MANAGEMENT

- 12.1 The Manufacturer shall establish, implement and maintain a configuration management system consistent with the requirements of this Agreement and BSISO 10007:2003 (Quality management systems – Guidelines for configuration management). For the avoidance of doubt, the Manufacturer shall apply configuration management both to the Interfaces it has with all PDPs and during the integration testing phase. All agreed configuration changes will be notified to the Purchaser.
- 12.2 The Manufacturer shall submit the configuration management documentation that records all configuration items of the installed hardware and software upon system handover to the Purchaser for Approval.
- 12.3 **Configuration Management Plan**
- (a) The Manufacturer shall establish an appropriate configuration management methodology for the Project and describe it in a configuration management plan ("**Configuration Management Plan**") which shall be submitted to the Purchaser for Approval.
 - (b) The Manufacturer shall establish, and describe in the Configuration Plan, an appropriate configuration management methodology for the Project.

13. PERFORMANCE MONITORING

- 13.1 During the Train Warranty Period, the Manufacturer shall monitor the performance of the relevant Fleet and submit performance data to the Purchaser at each Project Review Meeting. The scope of the performance monitoring shall include:
- (a) the analysis and modelling of Train performance data to produce component and system decay profiles from which accurate life cycle predictions and response triggers can be established; and

- (b) ongoing performance management and improvement recommendations through the definition of suitable metrics and the identification of performance trends for each metric.

The Manufacturer shall apply the performance management data to identify the root cause of problems and the Parties shall identify opportunities for effective actions to achieve improved performance of the Trains.

14. **TECHNICAL ADVICE AND TECHNICAL LIBRARY**

14.1 During the Train Warranty Period, the Manufacturer shall, when requested to do so by the Purchaser, provide verbal advice, written advice and other support to the Purchaser relating to:

- (a) the contents and structure of the Technical Library; and
- (b) the design, function and operation of the Trains and Equipment as they exist at the time of the Purchaser's request.

14.2 Without limitation the technical advice shall include:

- (a) providing support and advice to the Purchaser;
- (b) on-site attendance by the Manufacturer's technical staff;
- (c) on-site attendance by the OEM(s) procured by the Manufacturer;
- (d) writing reports and making recommendations, including designing solutions; and
- (e) providing advice supporting problem solving and business improvement initiatives.

14.3 Verbal technical advice shall be confirmed in writing by the Manufacturer as soon as reasonably practicable and, where relevant, the Manufacturer shall update the Technical Documents and/or the Technical Library to take account of any such technical advice so that the Technical Library remains up to date at all times.

14.4 **Technical Library**

- (a) The Manufacturer shall:
 - (i) structure the Technical Library so that the current version of each Technical Document is readily available, and make superseded Technical Documents available for reference but ensure they are appropriately marked and located to prevent any risk of their use in error;
 - (ii) ensure that the contents of the Technical Library are available to the Purchaser via a secure internet connection at all times, with such internet connection restricted in accordance with a security protocol to be agreed with the Purchaser in compliance with schedule 27 (Cyber Security);
 - (iii) ensure that the Technical Library is maintained in accordance with schedule 27 (Cyber Security) and in a secure environment and protected from unauthorised and/or malicious access, deletion or amendment;
 - (iv) ensure that data from the Technical Library is not stored outside the EU without the prior written consent of the Purchaser and provide, maintain and implement adequate back-up and redundancy of systems;

- (v) ensure that the Technical Library's structure and contents are clear and comprehensive;
- (vi) ensure amendments to the Technical Library are consolidated into relevant master documents and all other documents affected by a change are updated accordingly; and
- (vii) without prejudice to the Change Procedure, from the Commencement Date until the end of the Train Warranty Period in relation to the last Fleet ordered by the Purchaser under this Agreement, review and update the contents of the Technical Library, and keep the Technical Library fully updated and fit for purpose, including to reflect:
 - (A) the current Train configuration, Software and Train and Equipment Design from time to time;
 - (B) the current state and evaluation of the Train and Equipment Design;
 - (C) any Modifications to Trains;
 - (D) any Modifications to Equipment;
 - (E) the up-to-date Train Parameters;
 - (F) any changes to the Train Maintenance Regime; and
 - (G) any written confirmation of verbal technical advice in accordance with paragraph 14.3 above; and
- (viii) comply with the reasonable requirements of the Purchaser in respect of software (including versions), web browser compatibility, hardware specifications and other matters related to the Purchaser's access to the Technical Library.

15. SPARES MANAGEMENT

15.1 During the Train Warranty Period, the Manufacturer shall on a weekly basis:

- (a) utilise the performance monitoring outputs to:
 - (i) inspect the quantity and quality of Base Order Spares and monitor the quantity and quality of Base Order Spares being used for the activities set out in clause 7.15(a);
 - (ii) inform the Purchaser where the Base Order Spares do not meet the requirements of the Train Technical Requirements, or are not being replenished or Reconditioned at a rate to ensure compliance with clause 7.15(c); and
 - (iii) notify the Purchaser of the stock levels for all Spares and Consumables that the Purchaser will be required to maintain from 12 months following the end of the Train Warranty Period;
- (b) upon written request by the Purchaser, provide the Purchaser with such assistance, including:
 - (i) the provision of technical advice in relation to Spares and Consumables; and/or

- (ii) information including information relating to the price of any Spare and/or Consumable not listed in the Bill of Materials or Part A: (Base Order Spares) of schedule 8 (Spares and Special Tools),

in each case as may be reasonably necessary for the Purchaser to understand the pricing, technical and/or logistical aspects of exercising its right to order Base Order Option Spares pursuant to clause 6.6 and/or the Purchaser's option to issue an Initial Three Year Spares Option Notice pursuant to the FSA.

Appendix 1

Key Posts

The Key Posts shall be set out in the Project Execution Plan referred to in paragraph 9.1(a) of this schedule 5. Each position identified in the table below is a Key Post and the person named in respect of each Key Post shall carry out such role unless otherwise agreed in accordance with paragraph 3 of this schedule 5:

Key Post	Name
Manufacturer Contract Manager	[REDACTED]
Manufacturer Project Manager	[REDACTED]
Works Project Manager	[REDACTED]
Works Project Director	[REDACTED]
Works Engineering Manager (during design)	[REDACTED]
Engineering Safety Manager	[REDACTED]
Works Quality Manager	[REDACTED]
Assurance Manager (see paragraph 1.5 of schedule 6 (Assurance))	[REDACTED]
Manufacturer's Interface Manager	[REDACTED]
Chief Project Engineer	[REDACTED]
Health and Safety Director (see paragraph 1.2 of schedule 16 (Health, Safety and Environment))	[REDACTED]
Facility Manager (see paragraph 5 of Appendix 1 to Part A: of schedule 7 (Testing and Inspection))	[REDACTED]

Appendix 2

Approval Process

1. APPROVAL PROCESS

- 1.1 Where the Manufacturer is required to submit information, drawings and/or documents to the Purchaser for Approval, the Manufacturer shall comply with the requirements described in this Appendix 2. Any plan, programme, strategy or other document of the Manufacturer that is included in a schedule as at the Commencement Date shall be deemed to have been Approved in the form included in this Agreement but this is without prejudice to:
- (a) the obligations of the Manufacturer to revise and/or resubmit such document for Approval as required by this Agreement; and
 - (b) the requirements of this Agreement generally.
- 1.2 The Manufacturer shall ensure that each drawing, document, report and/or other information submitted to the Purchaser for Approval shall be in accordance with the requirements of paragraph 5 (Communications and Document Control and Document Management) of this schedule 5 and is accompanied by a request for review ("**Request for Review**").
- 1.3 The Manufacturer shall ensure that each Request for Review contains, to the extent applicable, the following information:
- (a) the sequential number referred to in paragraph 5.2(d) of this schedule 5 (which shall be independent of any drawing number);
 - (b) the drawing and/or document number, including where relevant the revision letter or number;
 - (c) the drawing title and/or title of the document;
 - (d) the date of submission;
 - (e) any supplementary information which is reasonably necessary to enable the Purchaser to make a decision in accordance with paragraph 1.4 below (including, where relevant, a description of the latest revision); and
 - (f) endorsement by the Manufacturer's relevant responsible manager.
- 1.4 Within 20 Working Days of the date the Purchaser receives a submission (provided it has been submitted in accordance with paragraph 5.2(d) of this schedule 5) from the Manufacturer for Approval (or such later date as notified to the Manufacturer in accordance with paragraph 1.5 below) the Purchaser shall review and comment, which may include a schedule of actions required to achieve Approval, on the information, drawing and/or document that has been submitted or re-submitted by the Manufacturer and return one copy of the Request for Review stamped or marked:
- (a) "Approval Granted"; or
 - (b) "No Approval".
- 1.5 Where the Purchaser considers that the complexity, detail, scope and/or nature of the drawings, documents and/or information submitted by the Manufacturer for Approval means that it may not be able to respond to the Manufacturer within 20 Working Days (or such different time period, if any, as is specified in the relevant clause) of receipt by it of

such submission, the Purchaser shall be entitled to an additional period of time to consider the submission provided that the Purchaser notifies the Manufacturer in writing within seven (7) Working Days (or such different time period, if any, as is specified in the relevant clause) of the date the Purchaser received the submission that the Purchaser is exercising its rights under this paragraph 1.5. Each notice served by the Purchaser pursuant to this paragraph 1.5 shall specify:

- (a) the details of the relevant submission;
- (b) the additional period of time required by the Purchaser; and
- (c) a description in reasonable detail as to the reasons why the additional time is required.

1.6 The Manufacturer shall undertake the following actions in relation to the information, drawing and/or document (as the case may be) that has been returned to it by the Purchaser in accordance with paragraph 1.4 and subject to the provisions of paragraph 1.10:

- (a) if such information has been stamped "No Approval", the Manufacturer shall immediately review and revise the relevant drawing, documents and/or information taking into account and incorporating the schedule of actions required to achieve Approval provided by the Purchaser pursuant to paragraph 1.4 and shall resubmit such information for Approval by the Purchaser in accordance with this Appendix 2; and
- (b) if such information has been stamped "Approval Granted", the Manufacturer shall be entitled to proceed on the basis of the drawing, documents and/or information submitted to the Purchaser;

1.7 If the Purchaser does not respond within the timeframe set out in paragraph 1.4, the Manufacturer shall forthwith seek further instruction from the Purchaser.

1.8 Unless otherwise required by the Purchaser, the Manufacturer shall only be required to submit one example of any sample, pattern or model in any request for Approval.

1.9 The Purchaser shall be entitled, on giving reasonable notice (which in any event shall be not less than two (2) Working Days) to:

- (a) request the Manufacturer to submit any further document, information, design, drawing, calculation, schedule, sample, pattern or model necessary to clarify, support and/or justify any submission for Approval; and
- (b) (acting reasonably) require the Manufacturer to attend a meeting to discuss any aspect of the drawings, documents and/or information submitted for Approval,

and the Manufacturer shall comply with any such request from the Purchaser. If the Manufacturer does not comply with any request made under paragraph 1.9(a) or does not attend a meeting required under paragraph 1.9(b) within the time required, then (without prejudice to any other rights of the Purchaser) the Purchaser's period for replying to any submission from the Manufacturer under paragraphs 1.4 or 1.5 shall be extended by the number of Working Days between the expiry of the contractual period for compliance and the actual date of compliance by the Manufacturer (including the day upon which the request is met or as applicable the meeting takes place).

1.10 When considering which category of response to give to a submission by the Manufacturer for Approval, the Purchaser shall not comment adversely on any submission if and to the extent the content of such submission is in accordance with the Train Technical Specification, Applicable Laws and Standards, Good Industry Practice and the provisions

of this Agreement. Otherwise, subject to paragraph 1.12 below, the Manufacturer agrees to incorporate all comments made by the Purchaser before re-submitting any drawing, document or information for Approval.

- 1.11 The Manufacturer may only exclude amendments requested by the Purchaser from the final version of the relevant document if the Manufacturer has satisfied the Purchaser as to the reason for such exclusion.
- 1.12 Once the Purchaser confirms its satisfaction with the final version of the relevant document, then the relevant document shall be **"Approved"** for the purposes of this Agreement.
- 1.13 No comment, stamping, marking or categorisation of any information, drawing or document shall diminish or relieve the Manufacturer from any of its obligations under this Agreement nor shall such comment, stamping, marking or categorisation be a Purchaser Change nor shall it permit the Manufacturer to any costs, relief or compensation of any kind.
- 1.14 Unless expressly stated otherwise the Manufacturer shall not be entitled to amend any Approved document in any manner or form without obtaining prior Approval to such amendment.

Appendix 3

Purchaser's Standard Method and Procedure for DTUP

Appendix 4

Template for Master Information Delivery Plan

SCHEDULE 6

Assurance

1. INTRODUCTION

- 1.1 The Manufacturer shall provide Assurance for all life cycle aspects of, and processes involved in, the Works including design, development, testing, service introduction, operation, Modifications, maintenance and disposal. Assurance shall therefore cover, amongst other things, as a minimum, the following:
- (a) design;
 - (b) safety;
 - (c) reliability;
 - (d) quality;
 - (e) testing;
 - (f) interfaces;
 - (g) maintenance;
 - (h) maintainability;
 - (i) operations;
 - (j) human factors;
 - (k) systems integration;
 - (l) normal, abnormal, degraded and emergency conditions;
 - (m) obsolescence; and
 - (n) configuration management.
- 1.2 The Manufacturer shall implement, manage and maintain throughout the Assurance Period a process of Progressive Assurance in order to explicitly demonstrate to the Purchaser that the requirements set out in this Agreement are being, and have been, fully met.
- 1.3 Assurance shall comprise coherent and convincing arguments supported by evidence which shall be documented in a way that is open to inspection.
- 1.4 The Manufacturer shall produce an Assurance Plan in accordance with the requirements of this schedule 6, which shall describe the Manufacturer's intended Assurance activities.
- 1.5 The Manufacturer shall appoint an assurance manager ("**Assurance Manager**") no later than one (1) month after the Commencement Date. The Assurance Manager shall, on behalf of the Manufacturer, be responsible for ensuring that the Assurance activities, as set out in this Agreement and the Assurance Plan are carried out correctly.
- 1.6 Assurance shall be consistent with, take account of, and demonstrate compliance with, all railway approval processes required by all Applicable Laws and Standards.

2. **VALIDATION AND VERIFICATION STRATEGY**

- 2.1 The Assurance Plan shall include a set of validation and verification strategies, defined by reference to the "V" life-cycle model referred to in paragraph 3 of schedule 17 (Design Management) ("**Validation and Verification Strategies**") which shall describe the means (whether by testing, certification or otherwise) by which the Manufacturer proposes to demonstrate to the Purchaser that a particular requirement (whether statutory, regulatory, contractual or otherwise) has been satisfied.
- 2.2 The Verification and Validation Strategies shall include a Train and Equipment Design verification process as a means of demonstrating compliance with all specified requirements and shall include compliance commentaries against the Train Technical Requirements and all Applicable Laws and Standards.
- 2.3 The Manufacturer shall progressively populate the Purchaser's IBM Rational DOORS requirements database (which contains the Train Technical Specification) with responses which demonstrate how each requirement in the Train Technical Specification has been satisfied.
- 2.4 The Manufacturer shall propose a Train and Equipment Design validation process to the Purchaser, which shall include as a minimum:
- (a) compliance with the requirements of this Agreement, including:
 - (i) the Train Technical Requirements; and
 - (ii) all Applicable Laws and Standards.
 - (b) the route to compliance, including:
 - (i) calculation;
 - (ii) relevant prior usage – fully detailed;
 - (iii) a proven comparable equivalent – fully detailed;
 - (iv) endurance tests; and
 - (v) Type Tests (including climatic where applicable);
- 2.5 Demonstration of safety adequacy of the Train and Equipment shall be carried out in compliance with the Yellow Book or a similar standard (provided the Purchaser has provided its prior written consent to such other standard being used).

3. **THE ASSURANCE PLAN**

- 3.1 The Manufacturer shall:
- (a) prepare a risk-based Assurance Plan; and
 - (b) within six (6) months of the Commencement Date, submit the Assurance Plan to the Purchaser for Approval in accordance with the Key Programme Dates.
- 3.2 The Assurance Plan shall contain:
- (a) a description of all of the Assurance activities required;
 - (b) a description of the application of the Verification and Validation Strategies referred to in paragraph 2.1 above;

- (c) a programme for the submission by the Manufacturer of the related Assurance information and/or documentation that will be submitted to the Purchaser for Approval. The Manufacturer shall ensure that the programme is structured to:
 - (i) allow regular intervals between the submission of information and/or documents to the Purchaser;
 - (ii) take into account any timeframes and/or approval periods specified in any Applicable Laws and Standards including conforming to the requirements of any Relevant Approvals;
 - (iii) be consistent with the Key Programme Dates; and
 - (iv) relate to the stages in the "V" life-cycle model prescribed by paragraph 2.1 above;
 - (d) details of how the Manufacturer will audit its own internal engineering management activities and those of any Subcontractor, as appropriate. The results of such audits shall be submitted to the Purchaser for Approval. These arrangements shall be in accordance with the programme described in paragraph 3.2(c)).
 - (e) details of how the Manufacturer will audit its own internal quality assurance activities and those of any Subcontractor, as appropriate. The results of such audits shall be submitted to the Purchaser for Approval. These arrangements shall be in accordance with the programme described in paragraph 3.2(c) above; and
 - (f) roles and responsibilities of those people producing or managing Assurance.
- 3.3 The Assurance Plan shall demonstrate that the Assurance processes will be applied throughout the Manufacturer's supply chain including all relevant activities carried out by Subcontractors as appropriate.
- 3.4 The Assurance Plan shall include at least the following six (6) Assurance Submission stages, as a minimum:
- (a) Assurance Stage 1 - Design Completion – following Approval of the Final Design Submission, as referred to in paragraph 8 of schedule 17 (Design Management);
 - (b) Assurance Stage 2 - Test Track – following completion of manufacture and static Type Testing of Trains and Equipment before dynamic testing on the Test Track Facilities;
 - (c) Assurance Stage 3 - Delivery – following completion of dynamic testing on the Test Track Facilities;
 - (d) Assurance Stage 4 - Trial Running – following delivery to, and commissioning in, the Delivery Depot;
 - (e) Assurance Stage 5 - Passenger Service - at Migration States, to be identified by the Manufacturer as Assurance Stage 5A, 5B etc. – following completion of all testing and trial running; and
 - (f) Assurance Stage 6 - Final Passenger Service - at the final Migration State for the relevant Fleet.
- 3.5 The Assurance Plan shall be updated by the Manufacturer as the Works evolve, including as a minimum after each Assurance Stage. All revisions to the Assurance Plan shall be submitted to the Purchaser for Approval.

- 3.6 The Manufacturer shall not make a submission for an Assurance Stage (which shall mean Approval of all relevant submissions to be made for that Stage in accordance with this schedule 6) until all the previous Assurance Stages have been Approved.

4. ASSURANCE STAGE 1 – DESIGN COMPLETION

- 4.1 The Manufacturer shall supply a suite of Train and Equipment Design information as part of the Assurance Stage 1 submission, in accordance with the Approved Assurance Plan, to enable the Purchaser to have a full understanding of the design to demonstrate that the Train and Equipment Design complies with this Agreement, which shall include, inter alia, the following:

- (a) a reference to the Final Design Submission that was Approved by the Purchaser in accordance with paragraphs 5.9 and 8 of schedule 17 (Design Management);
- (b) details of any amendments to the Train Technical Requirements previously granted in accordance with the Change Procedure;
- (c) a full and unambiguous description of all external interfaces to the Train and all internal interfaces within the Train;
- (d) the Technical Documents; and
- (e) records of the decisions regarding the criticality of components to achieve the performance and safety requirements of the Trains and Equipment.

- 4.2 Following the supply of the suite of Train and Equipment Design information required pursuant to paragraph 4.1, if the Purchaser is satisfied, acting reasonably, that all requirements of paragraph 4.1 have been met, the Purchaser shall grant Approval for Assurance Stage 1. If the Purchaser is not satisfied, acting reasonably, that all the requirements of paragraph 4.1 have been met, the Purchaser shall be entitled in its absolute discretion (and shall not be obliged) to grant Approval for Assurance Stage 1.

5. ASSURANCE STAGE 2 – TEST TRACK

- 5.1 The Manufacturer shall supply a suite of information as part of the Assurance Stage 2 submission, in accordance with the Approved Assurance Plan, to enable the Purchaser to have a full understanding of the manufacture of the Train and Equipment, its readiness to commence dynamic testing on the Test Track Facilities and the Train's compliance with this Agreement, which shall include, inter alia, the following:

- (a) a reference to the completed First Article Inspections and Routine Testing; and
- (b) updated Technical Documents.

- 5.2 Following the supply of the suite of information required pursuant to paragraph 5.1, if the Purchaser is satisfied, acting reasonably, that all requirements of paragraph 5.1 have been met, the Purchaser shall grant Approval for Assurance Stage 2. If the Purchaser is not satisfied, acting reasonably, that all the requirements of paragraph 5.1 have been met, the Purchaser shall be entitled in its absolute discretion (and shall not be obliged) to grant Approval for Assurance Stage 2.

6. ASSURANCE STAGE 3 - DELIVERY

- 6.1 The Manufacturer shall supply a suite of information as part of the Assurance Stage 3 submission, in accordance with the Approved Assurance Plan, to enable the Purchaser to have a full understanding of the manufacture and testing of the Train and relevant Equipment, its readiness for delivery to the Delivery Depot and the Train's compliance with this Agreement which shall include, inter alia, the following:

- (a) a summary of the results of the testing that has been carried out on the Test Track Facilities and trials for Assurance Stage 3, set out in the Schedule of Tests and Inspections in schedule 7 (Testing and Inspection);
- (b) a schedule of tests planned to be carried out on the LUL Network, extracted from the Schedule of Tests and Inspections in schedule 7 (Testing and Inspection) for Assurance Stage 4, identifying for each:
 - (i) the name or number of the test or trial;
 - (ii) the method; and
 - (iii) the pass/fail criteria;
- (c) a description of how the Manufacturer will ensure that it is safe to carry out delivery to, and storage of the Trains at, the Delivery Depot, identifying how the state of systems and equipment will be verified;
- (d) a description of how health and safety will be ensured during the delivery of the Train to the Delivery Depot and storage thereafter; and
- (e) updated Technical Documents.

6.2 Following the supply of the suite of information required pursuant to paragraph 6.1, if the Purchaser is satisfied, acting reasonably, that all requirements of paragraph 6.1 have been met, the Purchaser shall grant Approval for Assurance Stage 3. If the Purchaser is not satisfied, acting reasonably, that all the requirements of paragraph 6.1 have been met, the Purchaser shall be entitled in its absolute discretion (and shall not be obliged) to grant Approval for Assurance Stage 3.

7. **ASSURANCE STAGE 4 – TRIAL RUNNING**

7.1 The Manufacturer shall supply a suite of information as part of the Assurance Stage 4 submission, in accordance with the Approved Assurance Plan, to provide the Purchaser with a full understanding of the manufacture and testing of the Trains and Equipment, the Train's readiness for trial running on the LUL Network and its compliance with this Agreement which shall include, inter alia, the following:

- (a) a summary of the objectives and the scope of the trial running;
- (b) a schedule of forthcoming tests extracted from the Schedule of Tests and Inspections in schedule 7 (Testing and Inspection) identifying for each:
 - (i) the name or number of the test or trial;
 - (ii) the method; and
 - (iii) the pass/fail criteria;
- (c) a description of how the Manufacturer will ensure that it is safe to commence the trial running, identifying how the state of systems and equipment will be verified;
- (d) a description of how health and safety will be ensured during the trial running; and
- (e) updated Technical Documents.

7.2 Following the supply of the suite of information required pursuant to paragraph 7.1, if the Purchaser is satisfied, acting reasonably, that all requirements of paragraph 7.1 have been met, the Purchaser shall grant Approval for Assurance Stage 4. If the Purchaser is

not satisfied, acting reasonably, that all the requirements of paragraph 7.1 have been met, the Purchaser shall be entitled in its absolute discretion (and shall not be obliged) to grant Approval for Assurance Stage 4.

8. ASSURANCE STAGE 5 – PASSENGER SERVICE AND ASSURANCE STAGE 6 – FINAL PASSENGER SERVICE

8.1 The Manufacturer shall supply a suite of information for each Assurance Stage 5 Submission (to be identified by the Manufacturer as Assurance Stage 5A, 5B etc.) and for Assurance Stage 6 submissions, in accordance with the Approved Assurance Plan, to enable the Purchaser to have a full understanding of the Assurance of the manufacture and testing of the Train and its compliance with this Agreement which shall include, inter alia, the following:

- (a) the results of all the tests and trials listed in the Schedule of Tests and Inspections in schedule 7 (Testing and Inspection);
- (b) the results of all the tests of the interfaces with equipment supplied by PDPs;
- (c) a description of how the Manufacturer will ensure that it is safe to commence or continue passenger service; and
- (d) updated Technical Documents.

8.2 Following the supply of the suite of information required pursuant to paragraph 8.1, if the Purchaser is satisfied, acting reasonably, that all requirements of paragraph 8.1 have been met, the Purchaser shall grant Approval for Assurance Stage 5 and Assurance Stage 6. If the Purchaser is not satisfied, acting reasonably, that all the requirements of paragraph 8.1 have been met, the Purchaser shall be entitled in its absolute discretion (and shall not be obliged) to grant Approval for Assurance Stage 5 and Assurance Stage 6.

9. ENGINEERING SAFETY CASE

9.1 Each Assurance Submission shall include an engineering safety case ("**Engineering Safety Case**" in accordance with paragraph 13 and Appendix 1 to schedule 17 (Design Management), as updated from time to time, which shall:

- (a) describe the manner in which the Trains and Equipment satisfy the relevant safety requirements of this Agreement;
- (b) demonstrate to the Purchaser's reasonable satisfaction that the Trains and Equipment comply with:
 - (i) the Train Technical Requirements;
 - (ii) all Applicable Laws and Standards and Relevant Approvals;
 - (iii) "Railway Safety Principles and Guidance" (published by the Health and Safety Executive); and
 - (iv) all other requirements set out in this Agreement.

9.2 The Manufacturer shall submit at each Assurance Stage the Engineering Safety Case to the Purchaser for Approval before proceeding to the next Assurance Stage and on the dates shown in the Key Programme Dates. Each Engineering Safety Case submitted to the Purchaser shall be progressively revised to include additional information and/or evidence that has been obtained during each of the Assurance Stages prior to the Engineering Safety Case being submitted to the Purchaser for Approval.

- 9.3 In order for the Purchaser to undertake the review of an Engineering Safety Case, the Manufacturer shall provide all evidence included or referenced in such Engineering Safety Case to the Purchaser in a timely manner.

10. **CASE FOR CONTINUED SAFE OPERATION**

- 10.1 A substandard condition ("**Substandard Condition**") arises when for any Train:

- (a) a Pre-Provisional Acceptance Certificate has been issued for that Train; and
- (b) the condition or performance of the Train:
 - (i) falls below the minimum acceptable condition (as set out in the maintenance manual or the Minimum Acceptable Condition Standards set out in paragraph 14 of schedule 28 (Technical Information));
 - (ii) falls below the minimum declared tolerance (as set out in the maintenance manual); or
 - (iii) is in an unsafe condition,

unless the substandard condition has arisen wholly as a consequence of the Purchaser failing to maintain the Train in accordance with the Train Maintenance Regime.

- 10.2 On the occurrence of any such Substandard Condition(s), the Manufacturer shall prepare and submit to the Purchaser a Case for Continued Safe Operation ("**CCSO**") in accordance with the following:

- (a) the first issue of a CCSO shall be submitted by the Manufacturer to the Purchaser within 24 hours of discovery of the Substandard Condition. The first issue of the CCSO shall contain as much information in relation to such Substandard Condition as the Manufacturer is able to provide at that stage, and include a plan detailing how the Manufacturer intends to deal with the Substandard Condition;
- (b) following the first issue of a CCSO pursuant to paragraph 10.2(a) above, the Manufacturer shall submit regular updates of the CCSO to the Purchaser to record:
 - (i) progress;
 - (ii) completion of actions;
 - (iii) new evidence; and
 - (iv) decisions.

and such updates shall be submitted until the Substandard Condition has been resolved.

- (c) Any updates to CCSOs pursuant to paragraph 10.2(b) above shall:
 - (i) contain a structured argument providing a rationale for continued safe operation with supporting evidence and a plan including time-based actions to be carried out to both:
 - (A) mitigate the immediate unsafe condition; and
 - (B) rectify and permanently resolve the condition; and

- (ii) be submitted to a level of quality that is at least as good as that which the Manufacturer is required to submit all Assurance Submissions pursuant to this schedule 6 and all Design Submissions pursuant to schedule 17 (Design Management).

SCHEDULE 7

Testing and Inspection

- Part A: Testing and Inspection Requirements
- Part B: Testing and Inspection Strategy
- Part C: Schedule of Tests and Inspections
- Part D: Testing and Inspection Programme

Part A: Testing and Inspection Requirements

1. **Testing and Inspection Strategy, Schedule of Tests and Inspections and Testing and Inspection Programme**
- 1.1 The Manufacturer shall perform tests and inspections on the Trains and Equipment in accordance with the Testing and Inspection Strategy, Schedule of Tests and Inspections and the Testing and Inspection Programme in order to demonstrate (to the satisfaction of the Purchaser) that the Trains and Equipment are in accordance with every part of the Train Technical Requirements, the obligations of this Agreement and all Applicable Laws and Standards.
- 1.2 By the date that is the end of the Preliminary Design Phase, the Manufacturer shall provide to the Purchaser for Approval the draft testing and inspection strategy, the draft schedule of tests and inspections and draft testing and inspection programme (in the form described in Part B: (Testing and Inspection Strategy), Part C: (Schedule of Tests and Inspections) and Part D (Testing and Inspection Programme)), setting out how the Manufacturer shall satisfy the requirements of paragraph 1.1 of this Part A:.
- 1.3 No later than six (6) months prior to the date on which the first Test is scheduled to be carried out, the Manufacturer shall provide to the Purchaser for Approval updated versions of its:
 - (a) testing and inspection strategy (in the form set out in Part B: (Testing and Inspection Strategy) of this schedule 7);
 - (b) schedule of tests and inspections (in the form set out in Part C: (Schedule of Tests and Inspections) of this schedule 7); and
 - (c) testing and inspection programme (in the form set out in Part D: (Testing and Inspection Programme) of this schedule 7),

respectively, setting out the proposed dates for satisfying the requirements of paragraph 1.1 of this Part A. The Manufacturer shall not commence any testing until the schedule of tests and inspections has been Approved in accordance with paragraph 1.4 below.
- 1.4 Upon Approval of such draft strategy, draft schedule and draft programme, they shall be the **"Testing and Inspection Strategy"**, the **"Schedule of Tests and Inspections"** and the **"Testing and Inspection Programme"** respectively for the purposes of this Agreement. The Manufacturer shall submit any subsequent change to any of these to the Purchaser for Approval.
- 1.5 The Testing and Inspection Strategy, the Schedule of Tests and Inspections and the Testing and Inspection Programme shall together describe and set out the nature of the tests and inspections, (specifications, methodology, pass/fail criteria) test and inspection location and date for each test and inspection against the corresponding part of the Train Technical Specification and shall comprise the following parts:

- (a) First Article Inspection (in accordance with paragraph 2);
 - (b) Type Tests including the Energy Consumption Test and the Track Damage Assessment (in accordance with paragraph 3);
 - (c) Routine Tests (in accordance with paragraph 4);
 - (d) Maintainability Demonstration Testing (in accordance with paragraph 5);
 - (e) Customer Acceptance Testing (in accordance with paragraph 6);
 - (f) Integration Testing (in accordance with paragraph 7);
 - (g) Endurance Running (in accordance with paragraph 8);
 - (h) Depot/ Train Integration Testing (in accordance with paragraph 9); and
 - (i) LUL Network Testing (in accordance with paragraph 10).
- 1.6 If a test is failed, the Manufacturer shall advise the Purchaser of the proposed date of the re-test.
- 1.7 The Manufacturer shall ensure that any test failures are rectified both on the test Train or test item of Equipment and all necessary Modifications carried out to ensure compliance on all other Trains and items of Equipment.
- 1.8 Within 20 Working Days following the completion of an inspection or test in respect of a Train or item of Equipment the Manufacturer shall provide a report and test certificate to the Purchaser detailing the inspection or tests undertaken and results achieved to demonstrate that the Trains and Equipment have been built in accordance with every part of the Train Technical Requirements, the obligations set out this Agreement and all Applicable Laws and Standards. The test certificate and the associated test report shall be cross-referenced and included in the Train Logbook.
- 1.9 The Manufacturer shall set out in the Testing and Inspection Strategy how it proposes to re-test and/or re-inspect those Trains or Equipment that undergo Modifications that arise during the manufacturing or testing process and also where Equipment and Parts are sourced from Subcontractors different from those originally inspected and tested. Such changes shall include, but not be limited to any Part that affects its functionality, form, maintainability or asset life.
- 1.10 The Manufacturer shall re-test or re-inspect, as appropriate, and make all necessary allowance in the Testing and Inspection Programme for such re-testing or re-inspection.
- 1.11 The Manufacturer shall submit a full test specification to the Purchaser in respect of each test described in the Schedule of Tests and Inspections and the Testing and Inspection Programme shall indicate the date when such test specification shall be provided to the Purchaser for Approval (and such date of submission shall be no later than three (3) months before such test is scheduled to be carried out). Testing carried out to an unapproved test specification shall be at the Manufacturer's risk and the Purchaser shall have the right to request that the Manufacturer repeat such test to a specification that has been Approved by the Purchaser. Approval of the test specification shall be obtained at least 4 weeks prior to the date of the test and the Purchaser shall notify the Manufacturer whether it will witness such test. Each test specification and associated test results shall include:
- (a) test or inspection objectives;
 - (b) test or inspection procedure;

- (c) tolerances or limits;
 - (d) drawings or diagrams to show systems, circuits, dimensions, tolerances and finishes;
 - (e) weld category and data, radiographic or Non Destructive Testing ("**NDT**") examination records, together with applicable certification;
 - (f) test equipment, its installation, application and calibration records; and
 - (g) clearly defined pass / fail criteria.
- 1.12 The Manufacturer shall permit the Purchaser to undertake inspections and to instruct inspection hold points in accordance with the requirements detailed below:
- (a) the Manufacturer shall (and shall procure that its Key Subcontractors shall) permit the Purchaser access to undertake inspections for the duration of the Works during all normal working hours, which shall include the Manufacturer's Premises and premises of the Key Subcontractor, all assembly and production lines and sub-assembly areas and test areas; and
 - (b) the Purchaser shall determine the inspection hold points following consultation with the Manufacturer during production of the first Train and shall provide personnel to undertake the inspection in accordance with the Project Programme for subsequent Trains.
- 1.13 All test equipment used for testing and inspection shall be calibrated in accordance with the quality assurance procedures and shall comply with BS EN ISO 10012 "Measurement management systems - Requirements for measurement processes and measuring equipment". Tests undertaken using equipment without valid calibration shall be void.
- 1.14 Without prejudice to clause 9.3(b), the Purchaser shall be entitled to witness any Test or inspection and the Manufacturer shall provide a minimum of 20 Working Days prior written notice to the Purchaser of when such testing and inspection shall be undertaken (except that in relation to Routine Tests this shall be no less than three (3) weeks prior notice). The Manufacturer shall conduct each of the Tests described in the Testing and Inspection Strategy and Schedule of Tests and Inspections in accordance with the Testing and Inspections Programme.
- 1.15 The Integration Testing shall be facilitated by the Manufacturer.
- 1.16 The Manufacturer shall undertake the maximum possible number of tests prior to delivery of each Train to the Delivery Depot.
- 1.17 In the event of a failed LUL Network Test, the Manufacturer shall provide the following information to the Purchaser:
- (a) a description of the nature of the failure;
 - (b) the measures the Manufacturer intends to implement to achieve and demonstrate a pass; and
 - (c) details of how and when such measures will be implemented on subsequent Trains.
- 1.18 At any time the Purchaser may specify, acting reasonably, any additional tests and inspections which it requires in order to be assured that any Train and/or item of Equipment (as the case may be) has satisfied any of the requirements specified in this Agreement.

- 1.19 The Manufacturer shall conduct each of the tests described in the Testing and Inspection Strategy, Schedule of Tests and Inspections and the Testing and Inspection Programme in respect of the Trains and Equipment and shall promptly and in any event no later than five (5) Working Days following the conduct of a test in respect of a Train or item of Equipment provide the Purchaser with the results of that test, including test record sheets and whether the Train or Equipment passed or failed the test.
- 1.20 Pursuant to clause 15.2(i), at Pre-Provisional Acceptance of a Train the Manufacturer shall provide a Train Logbook to the Purchaser. During the Concept Design Phase, the Manufacturer shall submit a draft generic contents list and document structure for the Train Logbook.
- 2. First Article Inspection**
- 2.1 The Manufacturer shall conduct a FAI for all Parts and Subsystems of the Train and Equipment.
- 2.2 The Manufacturer shall supply all necessary drawings, specifications and measuring equipment to enable the Purchaser to witness and assess an FAI. The FAI shall include access to internal components where appropriate.
- 2.3 The Manufacturer shall record observations and propose remedial actions where a Part does not comply with the Train Technical Requirements and provide confirmation in writing that all such proposed changes as may be necessary are incorporated in the production of additional Parts and on the first Part inspected.
- 2.4 The FAI shall be timed to permit observations and requirements to be incorporated into article production without impact on the Key Programme Dates and delivery of Trains or Equipment.
- 2.5 Nothing in this schedule shall preclude the Purchaser from requiring the Manufacturer to undertake extra FAIs to confirm compliance with this Agreement.
- 2.6 Where FAIs are undertaken at a Subcontractor's premises, the Manufacturer shall attend all such FAIs.
- 3. Type Tests**
- 3.1 In the Testing and Inspection Strategy, the Schedule of Tests and Inspections and the Testing and Inspection Programme, the Manufacturer shall:
- (a) describe those Type Tests that it will conduct on the Trains and Equipment and those Type Tests that will be conducted in relation to a particular Subsystem or Part;
 - (b) identify any Type Tests that it can only undertake in relation to the Trains on the LUL Network; and
 - (c) ensure that the Testing and Inspection Programme clearly identifies which Type Tests are to be undertaken for each Migration State.
- 3.2 Type Tests shall verify the compatibility of all systems and equipment supplied by the Manufacturer.
- 3.3 Type Tests shall verify failure modes and degraded modes of operation where these are designed to keep a defective Train in service and or enable its prompt return to the relevant Designated Depot.

- 3.4 The equipment, components or systems forming part of redundant train systems shall be tested by the Manufacturer during endurance running including automatic changeover functions where appropriate.
- 3.5 Type Tests shall be undertaken in a systematic sequence to ensure that results on one system are not influenced by untested elements on a related system.
- 3.6 Type Tests that are required on the LUL Network shall be carried out in accordance with paragraph 10 of this schedule 7.
- 3.7 **Energy Consumption Test and Track Damage Assessment**

The Manufacturer shall carry out Type Tests in order to test the Train and to provide the data required in order to carry out each of the Energy Consumption Test and Track Damage Assessment.

4. **Routine Tests**

- 4.1 In the Schedule of Tests and Inspections, the Manufacturer shall describe the routine tests to be undertaken by the Manufacturer during and after the manufacture of each Train and item of Equipment to confirm that the quality, functionality, reliability and safety of each Train and item of Equipment is as is intended in the Train and Equipment Design (the **"Routine Tests"**). The Schedule of Tests and Inspections shall clearly define the scope of all Routine Tests to be undertaken on the Test Track Facilities.
- 4.2 The Manufacturer shall perform the Routine Tests on configured Trains as appropriate to the particular test, and such configuration shall be the configuration to be delivered and offered to the Purchaser for Acceptance and any revalidation of such Routine Tests shall be carried out prior to delivery at the Delivery Depot. Any deviation from these requirements shall be agreed between the Parties prior to testing of the relevant Train.
- 4.3 Without prejudice to paragraph 1.18, the Purchaser reserves the right to specify (at any time) any additional Routine Tests where the Purchaser reasonably considers further evidence is required to demonstrate that the Train or item of Equipment has satisfied any of the requirements specified in this Agreement and the Manufacturer agrees to carry out any such additional Routine Tests.

5. **Maintainability Demonstration Testing**

- 5.1 The Maintainability Demonstration Testing shall demonstrate that all Parts can be accessed, removed and re-fitted on Trains and Equipment safely in the specified time and with the specified labour and tools, at the Manufacturer's Premises in accordance with the Manuals. The Manufacturer shall provide the labour for the Maintainability Demonstration Testing when such tests are carried out at the Manufacturer's Premises.
- 5.2 The Maintainability Demonstration Testing shall demonstrate that all Parts can be accessed, removed and re-fitted on Trains and Equipment safely in the specified time and with the specified labour and tools, in each of the relevant Designated Depots (and, where Equipment is designed to be maintained at another location on the LUL Network, in that location) in accordance with the Manuals. The Purchaser shall provide the labour for the Maintainability Demonstration Testing when such tests are carried out at the Designated Depots.
- 5.3 Where this demonstration requires an interface with the depot equipment in a Designated Depot, this shall be included as a test on the first Train in accordance with the Testing and Inspection Programme and undertaken by the Purchaser in conjunction with the Manufacturer.

- 5.4 Without prejudice to paragraph 10.3 of this schedule 7, final Maintainability Demonstration Testing shall be performed with the Train in its normal operational state, on rails, and with any maintenance pits or access provision as intended in the final configuration of the relevant Designated Depot.

6. **Customer Acceptance Testing**

6.1 **Saloon Mock-up**

- (a) The Manufacturer shall construct a 1:1 scale Saloon Mock-up for Approval not later than the end of the Preliminary Design Phase and for use in the Customer Acceptance Testing.
- (b) The design of the saloon interior and exterior as depicted in the Saloon Mock-up shall be developed by the Manufacturer to be representative of the Preliminary Design.
- (c) The Saloon Mock-up shall be made available at the Manufacturer's Premises for review and Approval by the Purchaser before the Customer Acceptance Testing is undertaken.
- (d) The Approved Saloon Mock-up shall be delivered to a specified location in London and once installed used in the Customer Acceptance Test.
- (e) The Manufacturer shall, if notified by the Purchaser, either:
 - (i) remove the Saloon Mock-up from its location in London and transfer it to safe storage; or
 - (ii) dispose of the Saloon Mock-up,
 once it is no longer required by the Purchaser to be available at the Manufacturer's Premises.

6.2 **Customer Acceptance Testing: Train**

- (a) The Purchaser shall undertake Customer Acceptance Testing of the Train in accordance with the Customer Acceptance Testing Standard.
- (b) The Manufacturer shall assist the Purchaser to carry out such Customer Acceptance Testing of the Train.
- (c) The Purchaser shall notify the Manufacturer of the location of Customer Acceptance Testing and shall be responsible for preparing the site in order for Customer Acceptance Testing to take place.
- (d) The Purchaser shall produce a comprehensive report detailing the conclusion of the Customer Acceptance Testing for all stages of the testing, which shall demonstrate whether all satisfaction levels specified in the Customer Acceptance Testing Standard have been achieved or exceeded.
- (e) Following the production of the report, the Manufacturer shall submit to the Purchaser for Approval any proposed Modifications to the design of the Train as a result of the Customer Acceptance Testing, in accordance with the Technical Change Control Process set out in paragraph 11 of schedule 5 (Contract Management) and the following provisions shall apply:

- (i) if the proposed Modification is consistent with the requirements of the Train Technical Specification, the costs relating to the Technical Change Control Process shall be payable by the Manufacturer; and
 - (ii) if the proposed Modification will result in changes to the Train Technical Specification or make the design of the Train non-compliant with the requirements of the Train Technical Specification, the costs relating to the Technical Change Control Process shall be payable by the Purchaser.
- (f) The Parties acknowledge that, following a Modification, further Customer Acceptance Testing may be carried out by the Purchaser (at its sole discretion) for the purposes of confirming that the modified design of the Train achieves or exceeds the requisite satisfaction levels specified in the Customer Acceptance Testing Standard.

6.3 Customer Acceptance Testing: passenger seating and armrests

- (a) The comfort of passenger seats and armrests shall be demonstrated through a process of Customer Acceptance Testing carried out by the Purchaser, in accordance with Customer Acceptance Testing Standard Sections 5.1.1, 5.1.2 and 5.1.3, using representative seat mock-ups of all seat variants, not later than the end of the Preliminary Design Phase.
- (b) The Manufacturer shall assist the Purchaser to carry out such Customer Acceptance Testing of the passenger seats and armrests.
- (c) The Purchaser shall notify the Manufacturer of the location of Customer Acceptance Testing and shall be responsible for preparing the site in order for Customer Acceptance Testing to take place.
- (d) The Purchaser shall produce a comprehensive report detailing the conclusion of the Customer Acceptance Testing for all stages of the testing, which shall demonstrate whether all satisfaction levels specified in the Customer Acceptance Testing Standard have been achieved or exceeded.
- (e) Following the production of the report, the Manufacturer shall submit to the Purchaser for Approval any proposed Modifications to the design of the Train, passenger seats and armrests as a result of the Customer Acceptance Testing, in accordance with the Technical Change Control Process set out in paragraph 11 of schedule 5 (Contract Management) and the following provisions shall apply:
 - (i) if the proposed Modification is consistent with the requirements of the Train Technical Specification, the costs relating to the Technical Change Control Process shall be payable by the Manufacturer; and
 - (ii) if the proposed Modification will result in changes to the Train Technical Specification or make the design of the Train, passenger seats and armrests non-compliant with the requirements of the Train Technical Specification, the costs relating to the Technical Change Control Process shall be payable by the Purchaser.
- (f) The Parties acknowledge that, following a Modification, further Customer Acceptance Testing may be carried out by the Purchaser (at its sole discretion) for the purposes of confirming that the modified design of the Train, passenger seats and armrests achieve or exceed the requisite satisfaction levels specified in the Customer Acceptance Testing Standard.

7. **Integration Testing**

- 7.1 In accordance with schedule 26 (Systems Integration), the Manufacturer shall carry out integration testing ("**Integration Testing**") to prove the compatibility of the Train and Equipment with:
- (a) all systems supplied to the Manufacturer by the Purchaser, including Free Issue Materials and Pre-Specified Free Issue Materials;
 - (b) all Interfaces identified in Appendix 1 (Interface Matrix) of schedule 26 (Systems Integration) as well as any additional Interfaces established during the Train and Equipment Design;
 - (c) the LUL Network and, where applicable, Railway Infrastructure owned by:
 - (i) Network Rail; or
 - (ii) DLR.
- 7.2 Integration Testing shall consist of the following types of tests:
- (a) **Interface Tests:** Interface tests shall confirm that the interfaces between systems have been implemented correctly, both for function and performance. The corresponding test procedures shall be written to demonstrate successful functionality of all interfacing systems across an interface boundary;
 - (b) **Safety Tests:** The safety tests shall confirm that the safety-related functions work as required. The corresponding test procedures shall be written in order to demonstrate that the function cannot invoke an unsafe situation. The testing procedure shall test a scenario which may be potentially unsafe and verify that the system behaviour complies with safety requirements; and
 - (c) **Performance Tests:** Performance tests shall confirm that the integrated system is able to operate and meet the expected performance requirements and demonstrate the integrated system robustness.
- 7.3 All modes of operation (including system redundancy) shall be tested to the furthest extent possible.
- 7.4 Each Integration Test identified within the Schedule of Tests and Inspections will be assigned by the Purchaser to a Lead PDP.
- 7.5 Where the Manufacturer is Lead PDP it shall propose a draft test programme that defines the sequence and dates for each test stage for each Interface and the Purchaser shall procure that each other Lead PDP complies with the same obligation. Where the Manufacturer is Lead PDP, the Purchaser shall procure that the relevant Participating PDPs shall review the draft test programme and reach agreement. In the event of any disagreement, the Purchaser will determine the test programme.
- 7.6 The Purchaser shall procure that:
- (a) each Lead PDP will produce a test procedure for each Integration Test identified within the Schedule of Tests and Inspections; and
 - (b) an accompanying statement will be signed by the Lead PDP and each relevant Participating PDP to confirm that the appropriate information has been provided and that they have jointly reviewed and agreed the test procedure prior to the commencement of each Integration Test.

- 7.7 Where the Manufacturer acts as a PDP it shall appoint a Test Manager for the duration of Integration Testing, and the Purchaser shall procure the same in relation to the other PDPs.
- 7.8 Where the Manufacturer is Lead PDP, the Purchaser shall procure that each relevant Participating PDPs shall:
- (a) ensure that its Test Manager is responsible for the scheduling of the resources under their charge;
 - (b) liaise with the designated Lead PDP for the conduct of the tests and re-tests and co-ordinate with the Manufacturer for the commissioning and decommissioning of equipment at the Test Track Facilities;
 - (c) ensure that the testing activities under their charge are supported by adequate logistics capability, inclusive of initial and sustaining requirements for spares and consumables; and
 - (d) ensure that the systems and equipment under their charge do not interfere with the normal operation of the existing equipment in the surrounding environment.
- 7.9 Where the Manufacturer is Lead PDP for an Integration Test, the Manufacturer shall be responsible for compiling and submitting the respective test results for that Integration Test and reports to the Purchaser upon completion of each relevant Integration Test as specified in the test procedures.
- 7.10 The Purchaser shall be responsible for the overall management of the Integration Test programme. The Purchaser shall, in consultation with all relevant PDPs, further develop this programme with detailed tests.
- 7.11 The Manufacturer shall ensure those of its representatives involved in Integration Tests understand the roles and responsibilities of each PDP so that the activities can be carried out safely, efficiently and effectively. If, during the activities, the Purchaser considers that the team is not properly integrated or coordinated, then the Manufacturer shall comply with any requests of the Purchaser to rectify such issues.
- 7.12 In the event of a disagreement between PDPs on the production of the Schedule of Tests and Inspections and procedures, the Lead PDP shall refer the matter to the Purchaser for determination and such determination shall be final and binding. The Manufacturer shall not be entitled to claim for any additional payment pursuant to compliance with the Purchaser's determinations under this paragraph.
- 7.13 Where the Manufacturer is Lead PDP for an Integration Test, the Manufacturer shall:
- (a) ensure the readiness of resources and logistics to be provided for the relevant Integration Test is adequate and coordinated with other PDPs, to ensure their readiness for the tests; and
 - (b) take the lead in resolving any interface issues that arise from the test. The Manufacturer shall provide recommendations on all corrective measures required and submit any resolutions to the Purchaser for Approval.
- 7.14 Where the Manufacturer is a Participating PDP, the Manufacturer shall provide problem analysis and troubleshooting support to the Lead PDP with respect to the scope of works for which the Lead PDP is responsible.
- 7.15 The Manufacturer shall undertake all necessary tests and provide all information and assistance to enable the Purchaser to obtain consent for operation on and/or adjacent to third party railways as applicable and as referred to in paragraph 7.1(c).

- 7.16 The Integration Tests shall demonstrate that all systems and equipment are compatible in normal and degraded modes of operation.
- 7.17 Where the Manufacturer is Lead PDP, it shall liaise and agree the Schedule of Tests and Inspections with the Participating PDPs. The contents of the Schedule of Tests and Inspections shall include:
- (a) the process for testing;
 - (b) a brief system description, the inter-dependency and interaction of the PDP's subsystems and with systems supplied by other parties;
 - (c) roles and responsibilities during each Integration Test;
 - (d) the systems and equipment required from other PDPs to support Integration Tests;
 - (e) the plan for verifying the integrity of the test equipment and arrangements;
 - (f) the schedule of tests to be conducted;
 - (g) an equipment delivery and installation schedule and programme which shall include the proposed scope of supply for each PDP;
 - (h) programme of tests to be performed that demonstrates alignment to the Purchaser's schedule for the Deep Tube Upgrade Programme;
 - (i) configuration data for hardware, software and firmware test specifications to be used;
 - (j) the prerequisites for each Integration Test including state of the system, prerequisite tests and criteria;
 - (k) configuration of equipment;
 - (l) degraded modes to be tested;
 - (m) clearly defined pass/fail criteria; and
 - (n) actions and responsibilities in the event of failure.
- 7.18 All Integration Test specifications and results shall be provided by the Manufacturer to the Purchaser for Approval. Following Approval, the Manufacturer shall provide PDPs with test specifications and test results for acceptance of all Integration Tests to which their systems and equipment interface.
- 7.19 The Manufacturer shall:
- (a) liaise with suppliers of Free Issue Materials and Pre-Specified Free Issue Materials to ensure all necessary cross boundary tests are correctly specified and undertaken in accordance with this Agreement; and
 - (b) obtain acceptance in writing from suppliers of all Free Issue Materials and Pre-Specified Free Issue Materials for all cross boundary tests with agreed scope and all pass/fail criteria.
- 7.20 The Manufacturer shall participate in the tests and operate their system and equipment whenever necessary in all Integration Tests including attendance at Integration Tests led by Lead PDPs other than the Manufacturer.

- 7.21 The Manufacturer shall provide all necessary instrumentation for measurement, collection, recording and analysis of Train and Equipment data and associated test tools for Integration Tests, such instrumentation to be calibrated in accordance with paragraph 1.13. Proof of calibration shall be readily available for inspection by the Purchaser.
- 7.22 Throughout the period of Integration Tests, the Manufacturer shall submit a weekly test progress report to the Purchaser, reporting the progress status of the respective tests and any updates to the schedule.
- 7.23 In relation to Integration Tests where it is the Lead PDP, the Manufacturer shall:
- (a) hold weekly meetings at the agreed Test Track Facilities office to review progress and test progress reports; and
 - (b) hold test sign-off meetings after the completion of an Integration Test at which all test procedures, test results and findings, and outstanding non-conformance listing, shall be reviewed and examined. Test sign-off meetings shall be chaired by the Purchaser and attended by the Lead PDP and Participating PDPs.

8. **Endurance Running**

- 8.1 The Manufacturer shall conduct endurance running on each Train as follows:
- (a) the first two (2) Trains shall each complete at least 20,000 km MDBTSAF and each complete at least 5,000 consecutive km without a Technical Failure occurring;
 - (b) the next three (3) Trains shall each complete at least 5,000 consecutive km without a Technical Failure occurring; and
 - (c) each subsequent Train shall successfully complete at least 1,000 consecutive km without a Technical Failure occurring.
- 8.2 Endurance running shall include, as a minimum the following:
- (a) operation at full performance to replicate the typical in-service motoring-coasting-braking cycles in accordance with the Train Technical Specification;
 - (b) maximum acceleration, service braking with a non-receptive supply and emergency braking to be undertaken at a frequency to be proposed by the Manufacturer and agreed with the Purchaser;
 - (c) opening and closing of all passenger doors with occasional obstacles; and
 - (d) test all Train-to-track and track-to-Train communications.

9. **Depot/Train Integration Testing**

- 9.1 The objective of each Depot/Train Integration Test is to prove the system(s) delivered as part of the Purchaser Depot Works are compatible with the Trains and Equipment and are ready for use. This will also be used to prove that the Trains and Equipment is compatible with the existing facilities at the relevant Designated Depot(s).
- 9.2 The Manufacturer shall supply the necessary staff and facilities to support the Depot/Train Integration testing and to pass the relevant test.

10. **LUL Network Testing**

- 10.1 For Testing and validating each Train on the Railway Infrastructure the Parties acknowledge that it may be difficult to undertake some aspects of Integration Testing of

the Trains at a site other than on the LUL Network. An example of this might be validating all Train recovery scenarios between the new Trains and existing line specific stock.

- 10.2 In the Testing and Inspection Strategy, the Schedule of Tests and Inspections and the Testing and Inspection Programme the Manufacturer shall set out those LUL Network Tests required to show compliance with the Train Technical Specification in respect of individual Trains (including post-delivery/re-assembly, systems integration and reliability tests) and the Manufacturer shall schedule and carry out the tests to comply with the Key Programme Dates.
- 10.3 The Manufacturer acknowledges that the Purchaser shall not make the LUL Network available for testing unless the test requires a demonstration of compatibility with the LUL Network and the Manufacturer has satisfied the Purchaser that such test cannot be carried out elsewhere.
- 10.4 The Manufacturer may request use of the LUL Network and facilities to complete Type Testing on the first Train of each type but shall keep testing on the LUL Network to a minimum.
- 10.5 The Parties acknowledge and agree that in respect of the LUL Network Testing:
 - (a) the Manufacturer is responsible for:
 - (i) the provision of suitably competent persons necessary to conduct and supervise a test and to perform all of the activities described in this paragraph 10.5;
 - (ii) the provision of any equipment, Spares, Consumables and Special Tools necessary to conduct and/or monitor the tests to be performed by the Manufacturer and to undertake the activities under this paragraph 10.5;
 - (iii) the maintenance of the Trains prior to and after the conduct of a test and the repair and/or rectification of any Faults and/or damage;
 - (iv) obtaining any Relevant Approvals required to carry out the testing accordance with any Applicable Laws and Standards;
 - (v) giving at least the minimum amount of notice to the Purchaser, as required by the Purchaser's rules governing access to the LUL Network in force from time to time, of the start of any tests required on the running lines prior to approval to operate in traffic hours, including stabling requirements and paths to test locations;
 - (vi) making submissions, in accordance with the Purchaser's rules governing access to the LUL Network in force from time to time, to the Purchaser for the provision of suitable stabling, the necessary paths to and from the testing location, and suitable testing paths in each case for the relevant Trains;
 - (vii) providing all necessary information to obtain a Safety Certificate to support LUL Network Testing;
 - (viii) producing, in conjunction with the Purchaser, a method statement covering all aspects of the proposed tests;
 - (ix) paying all costs incurred by the Purchaser associated with the proposed testing except as referred to in paragraph 10.5(b)(v) below;

- (x) ensuring that all of the Manufacturer's and Subcontractor's staff participating in tests attend and pass the Purchaser's medical examination and safety training; and
 - (xi) ensuring that medical examinations and safety Training Courses, which are required for all LUL Network Testing, are completed and passed at least 30 working days before access is required;
- (b) provided that the Manufacturer has complied with its safety obligations under this Agreement, and has made the Trains available for the LUL Network Testing within the timeframes agreed with the Purchaser, the Purchaser is responsible for:
- (i) securing the paths and access rights for carrying out LUL Network Testing as agreed in the Schedule of Tests and Inspections;
 - (ii) providing operators necessary to drive the Train for the duration of each such test as agreed in the Schedule of Tests and Inspections;
 - (iii) the provision of suitable stabling for the relevant Trains and the necessary paths to and from the testing location as agreed in the Schedule of Tests and Inspections;
 - (iv) providing Training for the Manufacturer's personnel to undertake LUL Network Testing;
 - (v) providing free-of-charge the traction power for all LUL Network Testing;
 - (vi) providing access to equipment at the Designated Depots for the purposes of maintainability demonstration testing where an interface with existing LUL equipment is required to demonstrate compliance;
 - (vii) providing access to existing trains for the purposes of Train recovery validation; and
 - (viii) providing the Training Courses referred to in 10.5(a)(xi) above, free of charge; and
- (c) save as where otherwise provided under this Agreement, any delay howsoever caused or arising in agreeing the LUL Network Testing, obtaining a test path, conducting a test in accordance with the Testing and Inspection Programme and/or any other event contemplated by this paragraph 10.5 shall not:
- (i) constitute a Change under the Change Procedure; or
 - (ii) entitle the Manufacturer to an extension of time to the Contractual Acceptance Date for any Train or item of Equipment or otherwise entitle the Manufacturer to any relief from any of its obligations under this Agreement including any adjustment to the Key Programme Dates; or
 - (iii) in any way entitle the Manufacturer to be reimbursed for any costs and expenses incurred or otherwise compensated in any form or manner.

Appendix to Part A: Specification for provision and operation of the Manufacturer's Test Track Facilities

1. The objectives of Test Track Facilities Testing are as follows:
 - 1.1 To conduct a pre-delivery integrated test of the core systems to enable early identification and resolution of any integration issues prior to delivery and passenger service operation on the Purchaser's network.
 - 1.2 To validate the integration of systems according to the integrated system design documents established in the Design Phase, to the greatest extent possible. These systems include (but are not limited to) the Train, RCS S&TC, RCS OCS and PTI management systems and equipment.
2. The provision of Test Track Facilities, inclusive of the amenities, facilities and services specified for Test Track Facilities Testing and the cost of application for the necessary permits required by the local authorities for the performance of integrated train testing, shall be the responsibility of the Manufacturer.
3. Upon the completion of Integration Testing to the satisfaction of the Purchaser, the Purchaser shall procure that each PDP shall, with the approval of the Purchaser, co-ordinate with the Manufacturer to dismantle, decommission and remove the system and equipment they own on the Test Track Facilities.
4. The Manufacturer shall issue a Test Safety Plan. This plan shall be signed off by all PDPs involved and shall include the following:
 - (a) Site safety rules;
 - (b) Safety organisation;
 - (c) Definition and implementation of safety related documents;
 - (d) Health and safety rules in accordance to requirements for operating equipment and systems necessary for the test activities; and
 - (e) Qualification, certification and training required for test personnel.
5. **Facility Manager**
 - 5.1 The Manufacturer shall appoint and provide a facility manager, with responsibility for the management of the Test Track Facilities ("**Facility Manager**"). The roles and responsibilities of the Facility Manager shall be as follows:
 - (a) develop, implement and enforce the safety and security measures at the Test Track Facilities to ensure safe conduct of the tests;
 - (b) coordinate with all PDPs in provisioning the necessary electrical and mechanical services and facilities required for the conduct of the tests;
 - (c) coordinate the installation and dismantling of all equipment at the Test Track Facilities, including that of other PDPs;
 - (d) apply for the necessary permits for the performance of integrated train testing to all the relevant local authorities and bodies;
 - (e) coordinate the test schedule with all PDPs and the Purchaser;

- (f) act as the interface point to local authorities and bodies and the general public if the need arises; and
- (g) be responsible for carrying out induction for all persons using the site.

6. **Test Track Facilities**

6.1 The Manufacturer shall provide Test Track Facilities which are suitable for Type Testing, Routine Testing, Endurance Running and Integration Testing and which subject to paragraph 7.2 below, shall include the following characteristics:

- (a) a continuous circuit of at least 3km of track;
- (b) permit operation of the Trains at their maximum speed for at least 1km;
- (c) a double ended loop (with points at both ends with connections to the rest of the Test Track Facilities);
- (d) a 4th rail traction supply at both 630V or 750V nominal which can be made fully receptive for regenerative braking of the Trains when supplied at either nominal voltage;
- (e) means to create varying and low rail adhesion conditions;
- (f) sufficient workshop space, tools and equipment to perform maintenance, inspection and troubleshooting in accordance with the Train Maintenance Plan;
- (g) enable the full range of dynamic tests, including traction and braking tests, required to demonstrate compatibility and compliance with the Train Technical Requirements;
- (h) enable execution of the test specifications developed by the Manufacturer in accordance with the Testing and Inspection Strategy, Schedule of Tests and Inspections and Testing and Inspection Programme;
- (i) permit observation of the tests in a safe environment by the Purchaser (and/or any nominees or representatives of the Purchaser) and those PDPs responsible for the interfacing systems; and
- (j) a track layout sufficient to enable intensive mileage accumulation and reliability development activities.

7. **Test Track Facilities Integration Testing**

7.1 The Manufacturer shall make the Test Track Facilities available to facilitate the fitment of Test Track Facilities Integration Equipment that the Purchaser has made available pursuant to clause 14.2(a)(iii).

7.2 The details of the Interfaces with the PDPs will be developed in accordance with schedule 26 (Systems Integration). Notwithstanding this, the Manufacturer shall ensure that the characteristics of the Test Track Facilities for the use of the Test Track Facilities Integration Equipment include, or shall procure that they include, the following:

- (a) the Test Track Facilities shall support full speed running of the Train and have a variation of gradients and curvature to allow representative ATO running and an evaluation of performance and stopping accuracy on other than straight and level plain line;

- (b) the double ended loop shall be long enough to accommodate the longest version of the Train standing clear of the fouling points (including signalling safety distances) of the main running circuit;
- (c) the loop shall be fully signalled and controlled by the RCS S&TC deployed on the test track and shall facilitate the simultaneous operation of Trains. The loop P&C shall support run in and run out speeds similar to London Underground plain line capability;
- (d) a control room to accommodate PDPs who are operating the signalling equipment; and
- (e) cable runs and cable support systems and equipment mounting points around the Test Track Facilities as required by the PDPs for the installation and connection of the sub systems under test conditions.

Part B: Testing and Inspection Strategy

Part C: Schedule of Tests and Inspections

Part D: Testing and Inspection Programme

SCHEDULE 8

Spares and Special Tools

Part A:	Base Order Spares
Part B:	Base Order Special Tools
Part C:	Base Order Non-Standard Tools
Part D:	Bill of Materials

Part A: Base Order Spares

Part B: Base Order Special Tools

Part C: Base Order Non-Standard Tools

Part D: Bill of Materials**1. NOTES FOR THE COMPLETION OF THE BILL OF MATERIALS:**

1.1 The Bill of Materials shall be provided in Microsoft Excel Format.

1.2 The Bill of Materials is to be completed in full. Columns are free text with content to be completed by the Manufacturer. Columns with an * are to be completed using the options detailed below prescribed by the Purchaser. Options are defined in paragraph 1.3 below.

1.3 Definitions

(a) **"Item Code"** means the Manufacturer's part number for the Item. For Repair Services the part number is to be prefixed "REP".

(b) **"Item Type"**

Example Options:

- (i) Component
- (ii) Assembly
- (iii) Sub Assembly
- (iv) Consumable
- (v) Repair Service
- (vi) Tool
- (vii) Tool Calibration Status

(c) **"Parent Item"** – The master Item to which a sub assembly or component relates.

(d) **"Category"** – Train System to which the Item described is incorporated.

Example Options:

- (i) Braking Systems
- (ii) Traction/Propulsion
- (iii) Doors
- (iv) Carbody
- (v) Bogie/Suspension
- (vi) Couplings
- (vii) Underframe
- (viii) Auxiliaries
- (ix) Heating & Ventilation
- (x) Air Supply
- (xi) Electrical Distribution

- (xii) Emergency Equipment
- (xiii) Fault Recording Equipment
- (xiv) Communications
- (xv) Paint
- (xvi) Shoe gear
- (xvii) Equipment
- (e) **"Zone Code"** – As detailed in LU Category 1 Standard S1187 "Index of Components for Rolling Stock". Must be completed to 4 digits as a minimum and 6 digits where appropriate.
- (f) **"Manufacturer's Location Code"** – if required, produced by the Manufacturer
- (g) **"Safety Criticality Rating"** - as described in the Train Technical Specification
- (h) **"Description"** – Worded description of item. May also detail specification and/or drawing reference
- (i) **"UOM"** – Unit of Measure
- (j) **"Price"** – To be priced in GBP inclusive of delivery, Tooling Charges and duty excluding VAT
- (k) **"MOQ"** – Minimum order quantity
- (l) **"EOQ"** – Economic order quantity
- (m) **"Lead Time"** – Agreed period of time from issue of Purchase Order to delivery of the goods/services to the Purchaser's specified delivery location.
- (n) **"Warranty Period"** – Minimum period 2 years or to the end of the Train Warranty Period of the Fleet to which the Item/Spare/Consumable relates (if longer). Period commences upon delivery of an Item to the Purchaser.
- (o) **"Drawing Ref"** - Any drawings related to the Item.
- (p) **"Specification Ref"** - Any specification documents related to the Item.
- (q) **"Component Overhaul Instructions (COI) Ref"** – Reference to the related COI for the Item.
- (r) **"OEM"** – Original Equipment Manufacturer of the Item.
- (s) **"OEM Part Number"** - Original Equipment Manufacturer Part Number
- (t) **"OEM Drawing Ref"** - Original Equipment Drawing Reference
- (u) **"OEM Specification Ref"** - Original Equipment Manufacturer Specification Reference
- (v) **"Serialised Part"** – Identify if the Part is serialised
- (w) **"Storage Instructions"** – Any specific instructions relating to storage
- (x) **"Repairs"** - Manufacturer's Standard Labour Rate for Repairs

- (y) **"Design Life"** – as defined in clause 20.1
- (z) **"ACS/Overhaul Component? Y/N"** – indicate whether or not this Part satisfies the definition of an ACS/Overhaul Component
- (aa) **"Relevant Sample"** – for ACS Services, the sample size of each ACS/Overhaul Component on which the Manufacturer will carry out an Asset Condition Survey sufficient to give confidence to the Purchaser that (i) the sample is representative of the relevant Fleet; and (ii) the confirmation regarding Early Deterioration (as defined in the FSA) (or otherwise) in accordance with paragraph 8.4 of Part B of schedule 1 (The Services) of the FSA is valid

Bill of Materials – Picadilly Line

SCHEDULE 9
Purchaser Depot Works

SCHEDULE 10

Milestones and Security

- Part A: Advance Payment Bond
- Appendix 1 Form of Advance Payment Bond
- Part B: Milestones
- Appendix 1 Schedule of Milestones
- Appendix 2 Total Contract Price
- Appendix 3 Purchaser Milestone Payment Certificate
- Part C: Base Order Options for supply of further Trains and Equipment

Part A: Advance Payment Bond

1. ADVANCE PAYMENT BOND

1.1 Initial Advance Payment Bond

The Manufacturer shall, at its own cost, procure the issue of an Advance Payment Bond from an Advance Payment Bond Provider in favour of the Purchaser for an initial APB Bond Amount equal [REDACTED] (the "Initial APB Bond Amount").

1.2 Initial Advance Payment Bond Provider

The Advance Payment Bond procured pursuant to paragraph 1.1 must:

- (a) be issued by a financial institution which is acceptable to the Purchaser (acting in its absolute discretion) and which either:
 - (i) has a long-term credit rating of "A+" or better from Standard and Poor's Rating Services or the equivalent rating from any other agency of equivalent international reputation which rates the Advance Payment Bond Provider; or
 - (ii) at the Purchaser's absolute discretion, has a long-term credit rating of less than "A+" from Standard and Poor's Rating Services or equivalent rating from any other agency of equivalent international reputation which rates the Advance Payment Bond Provider;
- (b) have an expiry date which is no less than 12 months from the date of issue of the Advance Payment Bond.

1.3 Calling the Advance Payment Bond

The Purchaser shall be entitled to make a demand under any Advance Payment Bond in respect of:

- (a) amounts due to the Purchaser (or to which it is entitled) as a result of any failure by the Manufacturer to comply with the terms of this Agreement, whether or not this Agreement is, or is to be, terminated as a result; or
- (b) any non-payment by the Manufacturer of sums due to the Purchaser under the terms of this Agreement; or

- (c) additional costs the Purchaser expects to incur in connection with early termination of this Agreement, following the occurrence of an Event of Default, Prohibited Act or Safety Breach which is continuing, including the costs referred to in clause 35 and schedule 20 (Termination Payments); or
- (d) termination or expiry of this Agreement and, in either case, there are liabilities or obligations outstanding from the Manufacturer to the Purchaser; or
- (e) a Bond Event (other than an Insolvency Event) or an APB Provider Downgrade occurring and the Manufacturer having failed to put in place a replacement Advance Payment Bond in accordance with the terms of paragraph 1.5 of this Part A: of schedule 10 (Milestones & Security); or
- (f) any Advance Payment Bond being due to expire in ten (10) Working Days and the Manufacturer having failed to put in place a replacement or extended Advance Payment Bond in accordance with the terms of paragraph 1.5 of this Part A: of schedule 10 (Milestones & Security); or
- (g) an Insolvency Event occurring in relation to any Advance Payment Bond Provider under paragraph 4 of this Part A: of schedule 10 (Milestones & Security) and the Manufacturer having failed to put in place a replacement Advance Payment Bond in accordance with the terms of paragraph 1.5 of this Part A which is in place on such Insolvency Event occurring.

1.4 Maintenance of Advance Payment Bond

The Manufacturer shall maintain the continuing validity and effectiveness of any Advance Payment Bond until the date on which the APB Bond Amount under the relevant Advance Payment Bond has been reduced to zero in accordance with this schedule 10 (the "**APB Step-Down Date**"). The Manufacturer shall provide at least 35 Working Days' advance notice of the expiry of any Advance Payment Bond which has not reached its APB Step-Down Date. The Manufacturer shall promptly notify the Purchaser of the occurrence of a Bond Event.

1.5 Replacement of Advance Payment Bond

Subject to paragraph 2, where:

- (a) a Bond Event occurs; or
- (b) an Advance Payment Bond will expire prior to the APB Step-Down Date; or
- (c) an APB Provider Downgrade occurs,

the Manufacturer shall:

- (i) where a Bond Event or an APB Provider Downgrade occurs, deliver to the Purchaser another Advance Payment Bond(s) for an APB Bond Amount at the date of replacement equal to the APB Bond Amount under the then current Advance Payment Bond (or, as the case may be, equal to the APB Bond Amount under the previous Advance Payment Bond if such Advance Payment Bond has expired or terminated) after allowing for antecedent events which complies with the requirements of this Agreement in accordance with the process set out in paragraph 2; or
- (ii) where an Advance Payment Bond will expire, extend the term of the then current Advance Payment Bond (or replace it with another Advance Payment Bond) in each case with a validity period of not less than 12 months; or

- (iii) procure that alternative cash collateral or other security acceptable to the Purchaser in an amount equal to the APB Bond Amount from time to time under the affected Advance Payment Bond is made available to the Purchaser on such terms and conditions as the Purchaser shall, in its absolute discretion, consider appropriate,

and, if the Manufacturer fails to deliver such replacement or extended Advance Payment Bond or replacement security by no later than:

- (A) in the case of the occurrence of a Bond Event or APB Provider Downgrade:
 - (aa) 30 Working Days following the occurrence of the Bond Event or APB Provider Downgrade; or
 - (bb) if earlier, the appropriate time limit in accordance with paragraph 2 below; or
- (B) in the case where an Advance Payment Bond will expire, ten (10) Working Days prior to the expiry of the then current Advance Payment Bond,

it shall constitute a breach by the Manufacturer of the terms of this Agreement and the Purchaser shall be entitled to make demand under that Advance Payment Bond for the APB Bond Amount at that time, which amount shall be paid into an interest bearing account with a clearing bank of first class standing in London and held on trust for the Purchaser and the Manufacturer for application in or towards amounts in respect of which the Purchaser would have been entitled (or subsequently becomes entitled) to make any demand under the Advance Payment Bond. Any interest accruing in such account and any balance remaining at the APB Step-Down Date or earlier termination of this Agreement or such other date as the Purchaser shall determine following application by the Purchaser in accordance with this paragraph 1.5 shall, subject to the Purchaser's rights of set-off in clause 54 (Set Off), belong to the Manufacturer. If the Manufacturer subsequently delivers a replacement or extended Advance Payment Bond complying with the provisions of this Agreement, the balance standing to the credit of the account (including any amount in respect of interest accrued) shall belong to the Manufacturer and the Purchaser shall promptly take such steps as are reasonably requested by the Manufacturer to ensure release of such balance to the Manufacturer.

1.6 Substitution of Advance Payment Bond

Following the provision of any Advance Payment Bond, the Manufacturer may request that the Purchaser accept a replacement Advance Payment Bond in substitution for such Advance Payment Bond and the provisions of paragraph 2 shall apply other than paragraph 2.2(f)(ii). The Purchaser shall not refuse such request if the replacement Advance Payment Bond complies with all the requirements of this Agreement.

1.7 Increases in the Required APB Bond Amount

Subject to paragraph 1.9 (Exercise of Base Order Options or other Changes involving advance payments), the Purchaser shall only be obliged to pay to the Manufacturer each Milestone Payment in accordance with this schedule 10 if:

- (a) in relation to the first Milestone Payment, the Manufacturer has provided an Advance Payment Bond for the Initial APB Bond Amount as specified in paragraph 1.1;
- (b) in relation to all subsequent Milestone Payments, the Manufacturer has provided and continues to provide one or (subject to paragraph 3) more Advance Payment Bonds for (in aggregate) the Required APB Bond Amount at such time which are in full force and effect on the date of the relevant Milestone Payment; and

- (c) in relation to any Milestone Payment that falls due before Acceptance of the first Train (other than the first Milestone Payment):
- (i) in advance of the date of payment of such Milestone Payment, the Manufacturer has increased the APB Bond Amount under the Advance Payment Bonds in aggregate by the relevant amount specified against the relevant Milestone Payment in column (4) in the Schedule of Milestones set out in Appendix 1 to Part B: of this schedule 10; and
 - (ii) the Purchaser has received a certificate in the form set out in Appendix 1 to the relevant Advance Payment Bond(s) as evidence that the aggregate APB Bond Amount(s) under the Advance Payment Bonds has been increased by the relevant amount specified against the relevant Milestone Payment in column (4) in the Schedule of Milestones set out in Appendix 1 to Part B: of this schedule 10,

and the Required APB Bond Amount shall be increased accordingly.

1.8 Decreases in the Required APB Bond Amount

Subject to paragraph 1.9(c), upon Provisional Acceptance or Qualified Provisional Acceptance of each Train comprising the Base Order, the Required APB Bond Amount will be reduced by an amount equal to:

$$\frac{(A \times 0.95)}{B} \times T$$

where:

[REDACTED]
[REDACTED]
[REDACTED] (the "**Maximum IO Required APB Bond Amount**");

B is the number of Trains comprising the Base Order, being 94; and

T is the number of Trains being Accepted at the relevant time,

and the certificate in the form set out in Appendix 2 to the relevant Advance Payment Bond(s) reflecting such reduction shall be issued. If more than one Advance Payment Bond is in issue at any time that a reduction in the Required APB Bond Amount occurs pursuant to this paragraph 1.8, the Purchaser shall be entitled to elect how it applies the applicable reduction as between the APB Bond Amounts under such Advance Payment Bond(s), at the Purchaser's absolute discretion.

At the end of the Train Warranty Period for the Base Order, the Required APB Bond Amount will be reduced to zero.

1.9 Exercise of Base Order Options or other Changes involving advance payments

- (a) Following delivery of a Change Confirmation Notice in respect of a Base Order Option Train Change, the Manufacturer shall, as soon as practicable and in any event before any payment is due to be made by the Purchaser in relation to that Base Order Option:
 - (i) subject to paragraph 3 (Limit on Advance Payment Bonds), deliver to the Purchaser an additional Advance Payment Bond that complies with paragraphs 1.2(a) to (b) for the value of any initial payment to be made by the Purchaser in relation to that Base Order Option Train Change; or

- (ii) procure the increase of any then current Advance Payment Bond by the amount of any initial payment to be made by the Purchaser in relation to that Base Order Option Train Change; or
- (iii) put in place a new Advance Payment Bond that complies with paragraphs 1.2(a) to (b) for the value of any initial payment to be made by the Purchaser in relation to that Base Order Option if no Advance Payment Bond is in place at that point,

such that the amount of the initial payment due in relation to the relevant Base Order Option Train Change shall be added incrementally to the aggregate value of the then existing Advance Payment Bonds, and the Required APB Bond Amount shall be increased accordingly. The provisions of paragraphs 1.3 to 1.6 shall apply in relation to all such Advance Payment Bonds.

- (b) Following delivery of a Change Confirmation Notice in respect of a Base Order Option Train Change, the Purchaser shall only be obliged to pay to the Manufacturer each payment in the relevant Schedule of Payments (each a **"Base Order Option Milestone Payment"**) if:

- (i) in relation to the initial Base Order Option Milestone Payment, the Manufacturer has provided increased APB Bond Amounts in accordance with paragraph 1.9(a) above;
- (ii) in relation to all subsequent Base Order Option Milestone Payments, the Manufacturer has provided and continues to provide one or more Advance Payment Bonds for (in aggregate) the Required APB Bond Amount at such time which are in full force and effect on the date of payment of the relevant Base Order Option Milestone Payment; and
- (iii) in relation to any Base Order Option Milestone Payment that falls due before Acceptance of the first Base Order Option Train (other than the first Base Order Option Milestone Payment):
 - (A) in advance of the date of payment of such Base Order Option Milestone Payment, the Manufacturer has increased the APB Bond Amount under the Advance Payment Bonds in aggregate by the amount of that payment; and
 - (B) the Purchaser has received a certificate in the form set out in Appendix 1 to the relevant Advance Payment Bond(s) as evidence that the aggregate APB Bond Amount(s) under the Advance Payment Bonds has been increased by the required amount,

and the Required APB Bond Amount shall be increased accordingly.

- (c) Subject to paragraph 1.9(d), following delivery of a Change Confirmation Notice in respect of a Base Order Option Train Change, the provisions of paragraph 1.8 (Decreases in the Required APB Bond Amount) shall apply upon the Provisional Acceptance or Qualified Provisional Acceptance of each Train (whether comprising the Base Order or the Base Order Option Train Change) on the basis that:
 - (i) the words "each Train comprising the Base Order" shall be replaced with "each Train comprising the Base Order or the Base Order Option Train Change"; and
 - (ii) the formula in paragraph 1.8 (Decreases in the Required APB Bond Amount) shall be replaced with the following formula:

$$\frac{(((IOA+OOA) \times 0.95))}{B} \times T$$

where:

IOA is the Maximum IO Required APB Bond Amount (as set out in paragraph 1.8);

OOA is an amount which is the aggregate of the amounts by which the Required APB Bond Amount is to be increased in relation to the Base Order Option Train Change (including the initial increase in accordance with paragraph 1.9(a));

B is the aggregate number of Trains comprising the Base Order (as set out in paragraph 1.8) and the Base Order Option Train Change that have not yet been Accepted as at the date of the relevant Change Confirmation Notice; and

T is the number of Trains being Accepted at the relevant time.

- (d) The provisions of this paragraph 1.9 shall apply in relation to each successive Base Order Option Train Change (if any) in the same manner, save that for the purposes of paragraph 1.9(c) any previous Base Order Option Train Changes shall be deemed to form part of the Base Order (such that (A) the IOA in the formula shall include the OOA for such previous Base Order Option Train Changes, (B) the B in the formula shall include the number of Trains comprising such previous Base Order Option Train Changes).

2. **REPLACEMENT OF THE ADVANCE PAYMENT BOND PROVIDER**

2.1 **Substitute Advance Payment Bond Provider**

Where a replacement Advance Payment Bond is to be provided pursuant to this Part A: of schedule 10, the procedure in this paragraph 2 shall apply.

- (a) The substitute Advance Payment Bond Provider must either:
- (i) have a long-term credit rating of "A+" or better from Standard and Poor's Rating Services or the equivalent rating from any other agency of equivalent international reputation which rates the Advance Payment Bond Provider; or
 - (ii) at the Purchaser's absolute discretion, have a long-term credit rating of less than "A+" from Standard and Poor's Rating Services or equivalent rating from any other agency of equivalent international reputation which rates the Advance Payment Bond Provider.
- (b) Within ten (10) Working Days of the APB Provider Downgrade, Bond Event or receipt of notice of expiry pursuant to paragraph 1.4 (Maintenance of Advance Payment Bond), the Manufacturer will provide the Purchaser with a list of potential Advance Payment Bond Providers.
- (c) If the Purchaser consents (at its absolute discretion) to any such potential Advance Payment Bond Provider(s) the Manufacturer will procure an Advance Payment Bond from such institution:
- (i) if the replacement is required as a result of an APB Provider Downgrade or Bond Event, within five (5) Working Days of such consent; or

- (ii) if the replacement is required as a result of the impending expiry of the Advance Payment Bond, within ten (10) Working Days of such consent.
- (d) If the Purchaser does not consent to any of the potential Advance Payment Bond Providers it shall within five (5) Working Days of receipt of the list from the Manufacturer pursuant to paragraph 2.1(b) provide the Manufacturer with an alternative list of potential Advance Payment Bond Providers.
- (e) The Manufacturer shall use all reasonable endeavours to obtain an Advance Payment Bond from the list of potential Advance Payment Bond Providers notified pursuant to paragraph 2.1(d) and the Manufacturer shall within ten (10) Working Days of receipt of the list of the Purchaser's potential Advance Payment Bond Providers either procure an Advance Payment Bond from such an Advance Payment Bond Provider or provide the Purchaser with details of the process the Manufacturer went through to ascertain whether it could procure an Advance Payment Bond from such institutions.
- (f) If the Purchaser does not either:
 - (i) consent to a potential Advance Payment Bond Provider suggested by the Manufacturer pursuant to paragraph 2.1(b) within five (5) Working Days of receipt of such list; or
 - (ii) provide an alternative list pursuant to paragraph 2.1(d), within five (5) Working Days of receipt of the list from the Manufacturer pursuant to paragraph 2.1(b),

the Purchaser will be deemed to have accepted that an Advance Payment Bond provided by any of the potential Advance Payment Bond Providers suggested by the Manufacturer pursuant to paragraph 2.1(b) is acceptable and the Manufacturer must provide an Advance Payment Bond from any such potential Advance Payment Bond Providers within ten (10) Working Days of the Purchaser receiving the list provided by the Manufacturer pursuant to paragraph 2.1(b).

2.2 The Purchaser Right to Change the Advance Payment Bond Providers

- (a) At any time, the Purchaser may request that the Manufacturer replaces any Advance Payment Bond with an Advance Payment Bond from any of the alternative financial institutions provided on a list given by the Purchaser to the Manufacturer (the "**Alternative Suppliers**").
- (b) The Manufacturer shall use all reasonable endeavours to obtain an Advance Payment Bond from the Alternative Suppliers and shall within ten (10) Working Days of receipt of the list of Alternative Suppliers:
 - (i) confirm which (if any) of the Alternative Suppliers will provide an Advance Payment Bond which complies with this Agreement;
 - (ii) notify the Purchaser of the incremental cost of provision of an Advance Payment Bond which complies with this Agreement provided that the Manufacturer shall use all reasonable endeavours to mitigate any such incremental cost and shall provide evidence of such incremental cost on an open book basis; and
 - (iii) for any of the Alternative Suppliers that will not provide such an Advance Payment Bond, details of the process the Manufacturer went through to ascertain if such a bond was available.

- (c) The Purchaser will, within ten (10) Working Days of receipt of the information pursuant to paragraph 2.2(b), confirm which of the Manufacturer's proposals are acceptable.
- (d) If the Purchaser confirms that any of the Manufacturer's proposals are acceptable, the Manufacturer shall procure an Advance Payment Bond from the approved Alternative Suppliers within ten (10) Working Days of such confirmation.
- (e) If the Purchaser does not provide a confirmation pursuant to paragraph 2.2(c) above, the existing Advance Payment Bond shall remain in place.
- (f) If an Advance Payment Bond is procured pursuant to this paragraph 2.2:
 - (i) the Purchaser shall return the existing Advance Payment Bond to the Manufacturer once it has received the new Advance Payment Bond; and
 - (ii) the Milestone Payments shall be adjusted to take account of any increase in the cost of the provision of the new Advance Payment Bond as evidenced in accordance with paragraph 2.2(b)(ii).

3. **LIMIT ON NUMBER OF ADVANCE PAYMENT BONDS**

The Manufacturer may procure the issue in favour of the Purchaser a maximum of five (5) Advance Payment Bonds at any time. Where the Purchaser is entitled to make a demand pursuant to paragraph 1.3, such demand shall be made under any or all of the issued Advance Payment Bonds at the Purchaser's absolute discretion.

4. **INSOLVENCY EVENT OF AN ADVANCE PAYMENT BOND PROVIDER**

If there is an Insolvency Event in relation to any Advance Payment Bond Provider then, notwithstanding the other provisions of this Part A: including the Manufacturer's obligation to replace the Advance Payment Bond the Purchaser shall immediately be entitled to make demand under that Advance Payment Bond for the total amount of that Advance Payment Bond at that time, which amount shall be paid into an interest bearing account with a clearing bank of first class standing in London and held on trust for the Purchaser and the Manufacturer for application in or towards amounts in respect of which the Purchaser would have been entitled (or subsequently becomes entitled) to make any demand under the Advance Payment Bond. Any interest accruing in such account and any balance remaining at the APB Step-Down Date or earlier termination of this Agreement or such other date as the Purchaser shall determine following application by the Purchaser in accordance with this paragraph 4 shall, subject to the Purchaser's rights of set-off in clause 54 (Set Off), belong to the Manufacturer. If the Manufacturer subsequently delivers a replacement or extended Advance Payment Bond complying with the provisions of this Agreement, the balance standing to the credit of the account (including any amount in respect of interest accrued) shall belong to the Manufacturer and the Purchaser shall promptly take such steps as are reasonably requested by the Manufacturer to ensure release of such balance to the Manufacturer.

Appendix 1

to Part A:

Form of Advance Payment Bond

Advance Payment Bond

To: London Underground Limited of 55 Broadway, London, United Kingdom, SW1H 0BD (the "**Purchaser**")

Copy: Siemens Mobility Limited (Registered Number 016033) of Faraday House, Sir William Siemens Square, Frimley, Camberley, GU16 8QD (the "**Manufacturer**")

ADVANCE PAYMENT BOND No [●]

1. We have been informed that our customer, the Manufacturer, and you, the Purchaser, have entered into a contract dated [on or around the date hereof] / [●] for the design, build, test, commission and supply of rolling stock and related equipment and the provision of other ancillary services (the "**Manufacture and Supply Agreement**" or "**MSA**").
2. An advance payment amounting to £[●] and subsequent Milestone Payments will be made to the Manufacturer against this Advance Payment Bond in your favour, in accordance with the terms of the MSA.
3. In consideration of the aforesaid, we, [**Insert name of Advance Payment Bond Provider**], hereby irrevocably undertake to pay to you any amount you may claim from us upon receipt of your first demand in writing substantially in the form set out in Appendix 3 ("**Demand**") but not exceeding £[●], which amount may be varied from time to time in accordance with the terms of this Advance Payment Bond by delivery of certificates in the form specified in Appendices 1 and 2 (the "**APB Bond Amount**") and, for the avoidance of doubt, the giving of a certificate in the form specified in Appendix 1 by us to you shall be at our absolute discretion,

provided that:
 - (a) our liability under this Advance Payment Bond is limited to an amount or amounts in aggregate not exceeding the APB Bond Amount from time to time;
 - (b) any claim hereunder shall be accompanied by your statement that the amount claimed is due from the Manufacturer to you by reason of:
 - (i) any failure by the Manufacturer to comply with the terms of the MSA; or
 - (ii) any non-payment by the Manufacturer of sums due to you under the terms of the MSA; or
 - (iii) additional costs are expected to be incurred by you in connection with the early termination of the MSA following an Event of Default, Prohibited Act or Safety Breach which is continuing, including the costs referred to in clause 35 and schedule 20 (Termination Payments) of the MSA; or
 - (iv) termination or expiry of the MSA where, in either case, there are liabilities or obligations outstanding from the Manufacturer to you; or
 - (v) a Bond Event (except an Insolvency Event) has occurred in relation to this Advance Payment Bond or an APB Provider Downgrade has occurred to us

and the Manufacturer having failed to put in place a replacement Advance Payment Bond in accordance with the MSA; or

(vi) this Advance Payment Bond being due to expire ten (10) Working Days and the Manufacturer to put in place a replacement or extended Advance Payment Bond in accordance with the MSA; or

(vii) an Insolvency Event having occurred to us;

(c) the APB Bond Amount will decrease by an amount set out on the certificate of decrease on each occasion that a certificate in the form set out in Appendix 2 is delivered to us by you; and

(d) our liability under this Advance Payment Bond in respect of any claim is limited to an amount not exceeding the APB Bond Amount at the date of such claim less any and all amounts previously claimed and paid under this Advance Payment Bond.

4. This Advance Payment Bond shall be valid for Demands received in accordance with this Advance Payment Bond until the date (the "**Expiry Date**") which is the earlier to occur of:

(a) the date that you deliver to us an original certificate in the form set out in Appendix 4 notifying us that the Train Warranty Period (as defined in the MSA) has ended, and which reduces the APB Bond Amount to zero; and

(b) [●],

whereupon you shall return this Advance Payment Bond to the Manufacturer. After the Expiry Date, subject to any Demand that remains outstanding as of the Expiry Date, our undertaking will become automatically null and void if no claim has been received by us on or before that date, whether or not this Advance Payment Bond is returned to us.

5. There shall be no limit to the number of Demands that may be made hereunder.

6. We covenant, warrant and represent that we are duly authorised to enter into, deliver and perform this Advance Payment Bond and that it constitutes a valid, binding and enforceable obligation on us in accordance with its terms.

7. We shall make payment to you immediately upon service of your Demand:

(a) without regard to any information or instructions which we may then have received or may thereafter receive from any other source and we shall not be entitled to inquire into or require proof of the facts stated in the Demand, the respective rights and/or obligations and/or liabilities of the Purchaser and the Manufacturer under the MSA, the authenticity of any written Demand made by the Purchaser or the authority of the persons signing any written Demand by the Purchaser which, as between ourselves and you, shall be conclusive; and

(b) notwithstanding any dispute between the Manufacturer and you; it being the intention of the parties hereto that the event upon which payment must be made hereunder is the service of your Demand without any rights on our part to raise any objections, irrespective of the validity of the effectiveness of the MSA and the obligations arising thereunder and irrespective of the underlying facts or their significance under the MSA.

8. All sums payable under this Advance Payment Bond shall be paid in pounds sterling to such bank account as may be specified in your Demand in immediately available funds, free of any restriction or condition and free and clear of and without any deduction or withholding whether for or on account of tax, by way of set-off, or otherwise, except to

the extent required by law. If we are required by law to make any deduction or withholding, the amount payable by us hereunder shall be increased to such amount as shall ensure that you receive a net amount equal to the amount which would have been received in absence of such deduction or withholding.

9. Our obligations hereunder shall be direct, primary, irrevocable obligations and shall not be discharged, prejudiced or adversely affected by any of the following:
 - (a) any time, waiver, release, indulgence or forbearance which the Purchaser or its agents or representatives may grant to the Manufacturer or that the Manufacturer may grant to the Purchaser;
 - (b) any amendment or modification to the MSA;
 - (c) any invalidity, illegality or unenforceability in or of the terms of any agreement or other commitment to which the Manufacturer is or may become a party, including (without limitation) any invalidity in the MSA, or the avoidance, termination or other revocation of or loss of rights under the MSA;
 - (d) any disability, incapacity, change in ownership or change in status of the Manufacturer;
 - (e) an Insolvency Event in relation to, or a change in the constitution of, the Manufacturer;
 - (f) any breach of the MSA by any party thereto; or
 - (g) by any other matter or thing which in the absence of this provision would or might have that effect.
10. No failure or delay by the Purchaser in exercising any right or remedy shall operate as a waiver, nor shall any single or partial exercise or waiver of any right or remedy preclude its further exercise or the exercise of any other right or remedy.
11. Our rights and obligations under the Advance Payment Bond may not be assigned or transferred save with your prior written consent.
12. This Advance Payment Bond may be assigned or charged by you to any party to whom you are entitled to assign the MSA in accordance with the MSA.
13. This Advance Payment Bond may not be amended, varied or supplemented in any manner whatsoever without the prior written consent of the Purchaser and us, other than in accordance with its express terms.
14. This Advance Payment Bond is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758 (the "**Rules**") provided that:
 - (a) in the case of any conflict between the Rules and the provisions of this Advance Payment Bond, the provisions of this Advance Payment Bond shall take precedence; and
 - (b) Article 15 of the Rules shall be varied to enable the Purchaser to claim under this Advance Payment Bond in all circumstances set out in proviso (b) to paragraph 3 above.
15. Words and phrases defined in the MSA shall have the same meanings in this Advance Payment Bond unless inconsistent with the context.

16. Each of the provisions of this Advance Payment Bond is severable and distinct from the others, and if at any time any such provisions is or becomes ineffective, inoperable, invalid or unenforceable it shall be severed and deemed to be deleted from this Advance Payment Bond, and in such event the remaining provisions of this Advance Payment bond shall continue to have full force and effect.
17. This Advance Payment Bond and any non-contractual obligations arising out of it shall be governed and construed in accordance with the laws of England and Wales and the English Courts shall have exclusive jurisdiction in relation to any claim, dispute or difference concerning this Advance Payment Bond and any matter arising from it.
18. [We agree that [●] whose address is [●] is appointed as our agent for service of process in relation to any proceedings before the English court in connection with this Deed.]¹

Executed as a Deed this [●] day of [●] 201[●]

¹ Note: Required if the Bond provider is a non-UK entity.

Appendix 1 to the Advance Payment Bond
Certificate of Increase in APB Bond Amount

To: London Underground Limited

Date: [●]

Advance Payment Bond No. [●] issued in favour of London Underground Limited (the "Advance Payment Bond")

Dear Sir/Madam,

We refer to the Advance Payment Bond. Terms defined in the Advance Payment Bond have the same meaning in this Certificate.

We have been requested by our customer, *[Insert Manufacturer's name]*, to increase the APB Bond Amount under the Advance Payment Bond.

We notify you that with immediate effect, the APB Bond Amount for the purposes of the Advance Payment Bond is increased from £[●] to £[●].

Executed and delivered as a deed on behalf of [●]

Appendix 2 to the Advance Payment Bond

Certificate of Decrease in APB Bond Amount on PAC/QPAC

To: [Advance Payment Bond Provider]

Date: [●]

Advance Payment Bond No. [●] issued in favour of London Underground Limited (the "Advance Payment Bond")

Dear Sir/Madam,

We refer to the Advance Payment Bond. Terms defined in the Advance Payment Bond have the same meaning in this Certificate.

We notify you that Train number [●] achieved Provisional Acceptance or Qualified Provisional Acceptance, as the case may be, on [date].

Accordingly, the APB Bond Amount will be reduced by £[●]² [This is the calculation in paragraph 1.8 of Part A: of schedule 10 to the MSA having regard to the number of Trains Accepted to £[●] with immediate effect.

Yours faithfully

Executed as a Deed by the affixing of the common seal for London Underground Limited in the presence of:

Signature of authorised signatory..... Date.....

Name of authorised signatory.....

² Note: This is the amount calculated pursuant to paragraph 1.8 of Part A: of schedule 10 to the MSA having regard to the number of Trains Accepted, or, where more than one Advance Payment Bond is in issue, such part thereof as the Purchaser determines.

Appendix 3 to the Advance Payment Bond

Form of Demand

To: [●]

Date: []

Advance Payment Bond No. [●] issued in favour of London Underground Limited (the "Advance Payment Bond")

Dear Sir/Madam

We hereby demand the amount of £[] under the Advance Payment Bond,

Payment should be made to Account Number [], designated [] at [].

Capitalised terms used but not defined in this Demand shall have the meanings given to them in the Advance Payment Bond.

We³

1. confirm that the amount claimed is due from the Manufacturer to the Purchaser by reason of a failure by the Manufacturer to comply with the terms of the MSA.

OR

2. confirm that the amount claimed is due from the Manufacturer to the Purchaser by reason of the termination of the MSA.

OR

3. confirm that the amount claimed is due from the Manufacturer to the Purchaser by reason of additional costs the Purchaser expects to incur in connection with early termination of the MSA following an Event of Default, Safety Breach or Prohibited Act which is continuing, including the costs referred to in clause 35 and schedule 20 (Termination Payments) of the MSA.

OR

4. confirm that the amount claimed is due from the Manufacturer to the Purchaser by reason of termination or expiry of the MSA where, in either case, there are liabilities or obligations outstanding from the Manufacturer to the Purchaser.

OR

5. confirm that the amount claimed is due from the Manufacturer to the Purchaser by reason of the non-payment by the Manufacturer of sums due to the Purchaser under the terms of the MSA.

OR

6. confirm that a Bond Event (except an Insolvency Event) has occurred in relation to the Advance Payment Bond or an APB Provider Downgrade has occurred to you and the Manufacturer has failed to put in place a replacement Advance Payment Bond in accordance with the MSA.

³ Note: 1 to 8 are alternatives – LUL to include in demand the appropriate paragraph that applies.

OR

7. confirm that the Advance Payment Bond is due to expire in ten (10) Working Days and the Manufacturer has failed to put in place a replacement or extended Advance Payment Bond in accordance with the MSA.

OR

8. confirm that an Insolvency Event has occurred to you.

Yours faithfully

Authorised signatory of LUL

Appendix 4 to the Advance Payment Bond
Certificate of end of Train Warranty Period

To: [●]

Date: [●]

Advance Payment Bond No. [●] issued in favour of London Underground Limited (the "Advance Payment Bond")

Dear Sir/Madam,

We refer to the Advance Payment Bond. Terms defined in the Advance Payment Bond have the same meaning in this Certificate. We also refer to the manufacture and supply agreement dated [on or around the date hereof] for the design, build, test, commission and supply of rolling stock and related equipment and the provision of other ancillary services (the "**MSA**").

We notify you that the Train Warranty Period (as defined in the MSA) ended on [date].

Accordingly, the APB Bond Amount will be reduced to zero with immediate effect.

Yours faithfully

Executed as a Deed by the affixing of the common seal for London Underground Limited in the presence of:

Signature of authorised signatory..... Date.....

Name of authorised signatory.....

Part B: Milestones

1. Total Contract Price

The Parties acknowledge and agree that the Total Contract Price is the amount set out in the final row of column (2) of the table in Appendix 2 to this Part B: of schedule 10.

2. Schedule of Milestones

2.1 In order to achieve each Milestone in column (1) of the Schedule of Milestones, the Manufacturer must satisfy all of the requirements in column (2) of the Schedule of Milestones corresponding to such Milestone.

2.2 The Schedule of Milestones sets out (in column (3)) whether a payment is due for the achievement of the Milestone and where a payment is due the amount of the Milestone Payment due to the Manufacturer in respect of that Milestone, for which amount the Manufacturer may, subject to paragraph 4, apply for payment in accordance with this Part B: of schedule 10.

2.3 Notwithstanding any other provision in this Agreement, the Manufacturer shall not be entitled to any Milestone Payment if and to the extent that a previous Milestone has not been achieved, irrespective of whether the Purchaser accepts that a subsequent Milestone has in fact been achieved (and in determining whether a milestone has in fact been "achieved", and whether a milestone is "previous" or "subsequent", reference shall be made to the relevant scheduled date for achievement identified in column (5) of the Schedule of Milestones).

3. Notice of Achievement of Milestones

3.1 On the first day of each TfL Period, the Manufacturer shall, following completion of each Milestone in the previous TfL Period in accordance with paragraph 2.1, give to the Purchaser written notice to that effect together with reasonable evidence of such Milestone having been achieved ("**Notice of Milestone Achievement**").

3.2 Unless the Purchaser otherwise agrees in writing, the Manufacturer shall not be entitled to submit a Notice of Milestone Achievement in respect of a Milestone prior to:

- (a) the scheduled date for achievement of such Milestone identified in column (5) of the Schedule of Milestones; or
- (b) the achievement of a previous Milestone, irrespective of whether the Purchaser accepts that a subsequent Milestone has in fact been achieved (determined in accordance with paragraph 2.3 above),

irrespective of whether the Manufacturer in fact achieves that particular Milestone earlier than the applicable scheduled date for achievement.

4. Issue of the Purchaser's Milestone Payment Certificate

4.1 As soon as reasonably practicable, and in any event no later than 20 Working Days after the Purchaser's receipt of a Notice of Milestone Achievement under paragraph 3 above, the Purchaser shall either:

- (a) issue to the Manufacturer a "**Purchaser Milestone Payment Certificate**" certifying any amount proposed to be paid, including any amount to be withheld or deducted from the amount due, if any, and if so, the ground or grounds for such withholding or deduction and the amount of withholding or deduction attributable to each ground; or

- (b) issue to the Manufacturer a notice that the Purchaser does not accept any liability to make the relevant Milestone Payment, including the grounds for such notification, whether pursuant to paragraph 1.7 of Part A: (Advance Payment Bond) of this schedule 10, paragraph 2.3 or paragraph 3.2 of this Part B: or for any other reason permitted under this Agreement.

4.2 If the Purchaser issues a notice pursuant to paragraph 4.1(b), the Manufacturer shall be entitled to re-submit the relevant Notice of Milestone Achievement (with appropriate amendments as necessary) to the Purchaser once the grounds for the issue of that notice have been resolved, and this paragraph 4 and paragraphs 5 to 8 of this Part B: shall apply to such re-submitted Notice of Milestone Achievement as if it had been submitted pursuant to paragraph 3.

5. **Issue of Manufacturer's Invoice**

5.1 At any time after the issue of a Purchaser Milestone Payment Certificate pursuant to paragraph 4.1(a), the Manufacturer shall be entitled to deliver to the Purchaser an invoice (a "**Milestone Payment Invoice**") in the amount set out in the Purchaser Milestone Payment Certificate.

5.2 If the Purchaser has not issued either a Purchaser Milestone Payment Certificate or a notice pursuant to paragraph 4.1(b) by the expiry of the 20 Working Day period referred to in paragraph 4, the Purchaser shall be deemed to agree to pay the full amount of the relevant Milestone Payment as set out in column (3) of the Schedule of Milestones, and the Manufacturer shall be entitled to issue a Milestone Payment Invoice in respect of such amount.

6. **Effect of Milestone Payment Certificate**

6.1 The issue of a Purchaser Milestone Payment Certificate shall not be deemed to be evidence that any other certificate has been or should be issued nor shall the issue of a Purchaser Milestone Payment Certificate affect the requirements for the issue or revocation of any other certificate. The issue of a Purchaser Milestone Payment Certificate shall not be taken to mean that the relevant obligations have been completed in accordance with the terms of this Agreement or otherwise to the satisfaction of the Purchaser.

6.2 A failure by the Purchaser to issue a Purchaser Milestone Payment Certificate following the Purchaser's receipt of a Notice of Milestone Achievement, as described in paragraph 5.2, shall not be deemed to be a waiver or release of any rights to make a withholding or deduction that have arisen in accordance with the terms of this Agreement and shall not affect the Purchaser's right to apply such a withholding or deduction from any subsequent Milestone Payment.

7. **The Final Date for Payment**

The final date for payment of a Milestone Payment shall be 30 days after the date of receipt by the Purchaser of the relevant Milestone Payment Invoice pursuant to paragraph 5.

8. **Payment Conditions**

Any payments to be made by the Purchaser to the Manufacturer pursuant to this schedule 10 shall be made in accordance with the terms of clause 25 (Payments and VAT).

Appendix 1
to Part B:
Schedule of Milestones⁴

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone⁵	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond⁶	(5) scheduled Date for Achievement
1.	Commencement Date	Signature of this Agreement including satisfaction of all conditions precedent including an Advance Payment Bond in full force and effect with an initial APB Bond Amount equal to the proposed Milestone Payment.	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED]	
1a.	All Plans and strategies submitted and Approved	All updated or new Plans and strategies, including the Train Maintenance Regime, as identified in the Contract Documents that are required to have been submitted and Approved on or prior to the date stipulated as the Key Programme Date for this Milestone 1a have been submitted and Approved.	[REDACTED] [REDACTED]	[REDACTED]	
2.	Mobilisation and Concept Design	(1) Mobilisation of the Manufacturer's project team (including the appointment	[REDACTED] [REDACTED]	[REDACTED]	

⁴ Note: The Schedule of Milestones Table in Appendix 1 to Part B: of schedule 10 have been updated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

⁵ Note: all Key Programme Dates that Siemens has identified as being a precursor to achieving a Milestone have been set out in this Appendix 1 to Part 2 of schedule 10.

⁶ Note: The Purchaser will not accept an APB Bond Amount which is lower than the cumulative amount paid as Milestone payments for Trains and Purchased Items prior to Train Acceptance.

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone⁵	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond	(5) scheduled Date for Achievement
	Phase complete	of those Key Posts required to be appointed by the end of the Concept Design Phase); and (2) completion of the Concept Design as evidenced by Assurance of the Concept Design by the Purchaser in accordance with schedule 17 (Design Management).	[REDACTED] [REDACTED] [REDACTED]		
2a.	Approval of the Train/ PDP Interface Control Documents for Preliminary Design Phase	Approval of the Train/ PDP Interface Control Documents by the Purchaser in support of the Preliminary Design Phase	[REDACTED] [REDACTED]	[REDACTED]	
3.	Approval of the Train/ PDP Interface Control Documents	Approval of the Train/ PDP Interface Control Documents by the Purchaser.	[REDACTED] [REDACTED]	[REDACTED]	
3a.	Final Design Phase Complete	Completion of the Final Design Phase as evidenced by Assurance of the Concept Design by the Purchaser in accordance with schedule 17 (Design Management).	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED]	
4.	Commencement of the assembly of the first and second Trains in the Base Order Fleet	Commencement of the assembly of the first and second Trains in the Base Order Fleet, and confirmation that all necessary Manufacturing Tooling, materials, equipment and labour are available as	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED]	

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone⁵	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond	(5) scheduled Date for Achievement
		required.			
5.	Completion of the assembly of the first and second Trains in the Base Order Fleet	Completion of the assembly of the first and second Trains in the Base Order Fleet and completion of Routine Testing in accordance with schedule 7 (Testing and Inspection).			
5a.	Test Track Facilities available for Test Track Facilities Integration Equipment installation	Test Track Facilities fully prepared and made available for Project Delivery Partners integration equipment installation.			
6.	Commencement of the assembly of the third Train in the Base Order Fleet	Commencement of the assembly of the third Train in the Base Order Fleet, and evidence that all necessary Manufacturing Tooling, materials, equipment and labour are available as required to continue the manufacture of the Base Order Fleet.			
7.	Acceptance of the Train Driving Simulators	Issue of an Equipment Acceptance Certificate in relation to each Train Driving Simulator for the Base Order.			
8.	Train Acceptance	Issue of a QPAC or PAC (whichever occurs first) in relation to each Train.			

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone⁵	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond	(5) scheduled Date for Achievement
9.	Fleet Acceptance	Issue of Fleet Acceptance Certificate in relation to the Base Order Fleet.			

Appendix 3**to Part B:****Purchaser Milestone Payment Certificate****[To be issued on the Purchaser's headed notepaper]**

To: Siemens Mobility Limited

Faraday House, Sir William Siemens Square, Frimley, Camberley, GU16 8QD

Date: [●]

For the attention of: Manufacturer Contract Manager [REDACTED]

Manufacturer and Supply Agreement dated [●] and made between Siemens Mobility Limited (the "Manufacturer") and London Underground Limited (the "MSA")

Words and expressions defined in the MSA shall have the same meanings when used in this certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this certificate.

This certificate constitutes a Purchaser Milestone Payment Certificate under the MSA and I, [the **"Purchaser Contract Manager"**] on behalf of the Purchaser hereby confirm to the Manufacturer that, as at the date of this certificate the Manufacturer has achieved Milestone [*insert Milestone number*], as set out in Appendix 1 (Form of Advance Payment Bond) to Part B: of schedule 10 (Milestones and Security) of the MSA.

[The Purchaser proposes to withhold or deduct the following sums due to it from the Manufacturer from the amount of the Milestone Payment as set out in Appendix 1 to Part B: of schedule 10 of the MSA:]⁷

Ground for application of withholding or deduction	Amount of withholding or deduction
<i>Preconditions Retention pursuant to clause 15.11</i>	£[]
<i>Liquidated damages agreed or determined to be payable pursuant to clause 16.6</i>	£[]
<i>Premium paid by Purchaser for insurances pursuant to paragraph 13 of Part A: of schedule 13 (Insurance)</i>	£[]
<i>Other amounts to be withheld or deducted pursuant to clause 54 (Set-off)</i>	£[]

The Purchaser agrees to the Manufacturer issuing a Milestone Payment Invoice in relation of Milestone [*insert Milestone number*] in the amount of £[*Milestone Payment set out in column (3) of the Schedule of Milestones (less the total amount of withholdings or deductions (if any))*].

The issue of this Purchaser Milestone Payment Certificate shall not be taken to mean that the relevant obligations of the Manufacturer have been completed in accordance with the terms of the MSA or otherwise to the satisfaction of the Purchaser.

Signed on behalf of **London Underground Limited**

Name _____ Date _____

⁷ Note: This paragraph and following table only to be included if the Purchaser proposes to apply any withholding or deduction to the relevant Milestone Payment in accordance with the terms of this Agreement.

Position: Purchaser Contract Manager

Part C: Base Order Options for supply of further Trains, Train Driving Simulators, Cab Conversion Units and Spares

1. Base Order Option Price for Base Order Options

TABLE 1 – OPTION PRICES⁸

Column 1		Column 2	Column 3
Base Order Option Trains			
Option Train Driving Simulators			
Base Order Option Cab Conversion Units			
Base Order Option Spares			

Where the Purchaser delivers a Base Order Option Notice under clause 6.6(a), the Base Order Option Price shall be the Foreign Exchange Adjusted Base Order Option Price calculated as set out in paragraph 1.1 below.

1.1 Foreign Exchange Adjustment

The Foreign Exchange Adjusted Base Order Option Price for each Base Order Option Train, Option Train Driving Simulator, Base Order Option Spares or Base Order Option Cab Conversion Units shall be calculated by applying the Agreed Forward Rates to the relevant amounts in Table 2 below that are not denominated in £ sterling and adding the relevant amount in Table 2 denominated in £ sterling.

TABLE 2 – FOREIGN CURRENCY BREAKDOWN⁹

Column 1	Column 2	Column 3

8 Note: Table 1 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

⁹ Note: Table 2 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

	[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]
[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]

SCHEDULE 11

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
[REDACTED] [REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED] [REDACTED]	[REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]	

[illegible]

[illegible]

[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
		[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED]	
[REDACTED] [REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	
	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	

[illegible]

[illegible]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

SCHEDULE 12

Change Procedure

- Part A: General
- Part B: Purchaser Changes
- Part C: Manufacturer Changes
- Part D: Compensation Changes
- Part E: Base Order Option Train Changes and WLO Additional Trains Changes

Appendix 1: Schedule of Costs

Appendix 2: Calculation of Change in Costs

Appendix 3: Manufacturer's Margin

Part A: General

1. Scope

Any amendment to the terms of this Agreement, including to the rights and/or obligations of the Manufacturer or the Purchaser under this Agreement shall, save expressly provided to the contrary in this Agreement, be made in accordance with the procedure set out in this schedule 12.

2. Duties

- 2.1 In exercising any of their rights and performing any of their obligations under this schedule 12, the Parties shall use reasonable endeavours to act in such a manner as to simplify and minimise the administrative time and costs incurred in dealing with any Change proposal.
- 2.2 Each Party agrees to act reasonably and not to require the other Party to undertake unnecessary and onerous work in relation to a Change proposal.

3. Changes to FSA

If one Party informs the other Party that it considers that a Change proposed in relation to this Agreement is either related to a Change proposed in relation to the FSA or that, if implemented, would require the making of a Change under the FSA, as applicable, then:

- (a) the proposals under this Agreement and under the FSA (as applicable) shall be considered concurrently; and
- (b) a Change Confirmation Notice or a Claim Confirmation Notice (as the case may be) shall not be issued in relation to one of the related Changes alone.

Part B: Purchaser Changes

1. Purchaser Change Notice

- 1.1 The Purchaser shall be entitled at any time during the duration of this Agreement to propose a Change ("**Purchaser Change**").
- 1.2 If the Purchaser wishes to propose a Purchaser Change, it shall serve a notice ("**Purchaser Change Notice**") on the Manufacturer. The Purchaser Change Notice shall only be valid if it is signed by the Purchaser Contract Manager and shall set out details of the proposed Purchaser Change in sufficient detail to enable the Manufacturer to provide the Initial Change Appraisal in accordance with paragraph 2 (Initial Change Appraisal).
- 1.3 If the Purchaser considers, in its absolute discretion, that a Change needs to be implemented immediately (an "**Emergency Change**") then the Purchaser shall indicate in the Purchaser Change Notice or at any time during the process set out in this Part B: that the Purchaser Change is an Emergency Change and the Manufacturer shall commence the implementation of such Purchaser Change forthwith notwithstanding that the full process in this Part B: has not been followed. The provisions set out in the remainder of this Part B: shall apply to such Emergency Change save that, where the context requires, such provisions shall be read having regard to the fact that the Manufacturer has already commenced the implementation of the Purchaser Change.
- 1.4 In relation to an Emergency Change, the Purchaser shall:
 - (a) during the implementation of any Emergency Change and prior to the full Purchaser Change process having been duly completed (in accordance with this Part B), pay to the Manufacturer following the end of each TfL Period an amount to cover any reasonable interim incremental costs, fees and expenses reasonably and properly incurred during that TfL Period as a direct result of the implementation of the Emergency Change ("**Emergency Change Interim Payments**"). Any Emergency Change Interim Payments will be reconciled in the Schedule of Payments in accordance with paragraph 7.5 of this Part B; and
 - (b) if (where the Purchaser is not precluded under this Agreement from doing so) the Purchaser withdraws the relevant Purchaser Change Notice (or if it is deemed withdrawn), pay the reasonable costs properly incurred by the Manufacturer in respect of the Emergency Change prior to such withdrawal (to the extent not already covered by the Emergency Change Interim Payments).

2. Initial Change Appraisal

- 2.1 As soon as practicable and in any event within 20 Working Days after receipt of a Purchaser Change Notice (or such longer period as is agreed by the Purchaser acting reasonably), the Manufacturer shall, subject to clause 10.6(d) and paragraph 5 of Appendix 2 to schedule 17, deliver to the Purchaser a written report (an "**Initial Change Appraisal**") which shall set out:
 - (a) whether, in the reasonable opinion of the Manufacturer, including an explanation of the Manufacturer's reasons for such an opinion, the proposed Purchaser Change would:
 - (i) be technically unfeasible or impossible; or
 - (ii) be illegal or put it in breach of its Safety Obligations where such illegality or breach could not be remedied by the Manufacturer making other changes to the Trains or Works in order to accommodate such Purchaser Change,

in each case in a manner that cannot be compensated or relieved by this schedule 12;

- (b) the Manufacturer's initial assessment of any impact of the proposed Purchaser Change on any of the dates or activities referred to in the relevant Key Programme Dates, the Contractual Provisional Acceptance Dates, the Contractual Final Acceptance Dates, the Contractual Fleet Acceptance Dates and the WLO Break in Production Dates;
- (c) the Manufacturer's initial assessment of the scope of any changes to the Works, the Trains or the Equipment or any additional works required to implement the proposed Purchaser Change, including:
 - (i) any investigatory or detailed design work which would have to be carried out in advance of preparing or finalising a Change Appraisal in respect of the proposed Purchaser Change; and
 - (ii) any changes to the Works or additional works which, in order to achieve the proposed Purchaser Change or to avoid or minimise any abortive works, would have to be commenced in advance of preparing or finalising a Change Appraisal in respect of the proposed Purchaser Change;
- (d) the Manufacturer's initial assessment of any impact of the proposed Purchaser Change on any of the Train Financial Models;
- (e) the Manufacturer's estimate, acting in good faith, of all Change in Costs under this Agreement that are associated with the proposed Purchaser Change, identifying separately each Change of Cost with such estimate;
- (f) without prejudice to paragraph 3 (Changes to FSA) of Part A: (General) of this schedule 12, the Manufacturer's initial assessment of the impact of the proposed Purchaser Change on the FSA;
- (g) the Manufacturer's initial assessment of the impact of the proposed Purchaser Changes on the number of Base Order Warranty Spares, Base Order Purchaser Fault Spares and/or Base Order Maintenance Spares that are required to be provided pursuant to this Agreement;
- (h) the Manufacturer's initial assessment of any amendments that need to be made to the Bill of Materials;
- (i) the Manufacturer's initial assessment of any amendments that need to be made to the Technical Documents; and
- (j) the Manufacturer's reasonable estimate of the cost and time required to prepare a Change Appraisal in respect of the proposed Purchaser Change in accordance with paragraph 4 (Change Appraisal),

taking into account, in the case of an Initial Change Appraisal issued in response to a Base Order Option Notice or a WLO Additional Trains Option Notice, the matters set out in Part E: (Base Order Option Train Changes and WLO Additional Trains Changes).

2.2 The Manufacturer's estimate referred to in paragraph 2.1(e) shall include:

- (a) a Fixed Price Quotation; and
- (b) the Manufacturer's proposed Schedule of Payments (to cover the Fixed Price Quotation).

3. **Procedure Following Submission of an Initial Change Appraisal**

- 3.1 If the Initial Change Appraisal states that, in the Manufacturer's opinion, the proposed Purchaser Change falls within one or more of the restrictions set out in paragraph 2.1(a), then the Manufacturer shall be entitled to object to the implementation of the proposed Purchaser Change, save that the Manufacturer shall not be entitled to object to a Base Order Option Train Change or a WLO Additional Trains Change on any of the grounds in paragraph 2.1(a) if the Manufacturer can be compensated by this schedule 12.
- 3.2 If the Purchaser disagrees with the Manufacturer's opinion, then the Parties shall seek to resolve the matter(s) in dispute and, if agreement has not been reached within ten (10) Working Days of receipt of the Initial Change Appraisal, the Purchaser may refer the matter for resolution under the Dispute Resolution Procedure. If the Purchaser has not referred the matter to the Dispute Resolution Procedure within 20 Working Days of receipt of the Initial Change Appraisal, the Purchaser Change Notice shall be deemed to be withdrawn.
- 3.3 Provided that the Purchaser Change Notice has not been withdrawn by the Purchaser (or deemed to have been withdrawn in accordance with paragraph 3.2), then within 20 Working Days after receipt of the Initial Change Appraisal (or a determination in favour of the Purchaser following a reference to the Dispute Resolution Procedure under paragraph 3.2), the Purchaser shall issue a Change Appraisal Instruction instructing the Manufacturer to prepare a Change Appraisal in respect of the proposed Purchaser Change.
- 3.4 If the Purchaser has not issued a Change Appraisal Instruction within such 20 Working Day period, the Purchaser Change Notice shall be deemed to have been withdrawn.
- 3.5 A Change Appraisal Instruction provided by the Purchaser under paragraph 3.4 shall:
- (a) state any requirement which the Purchaser has with regard to the form of procurement;
 - (b) include any additional information in respect of the proposed Purchaser Change which the Purchaser requires the Manufacturer to consider when preparing the Change Appraisal; and
 - (c) specify any reporting format, break down of quotations or any other matters specifically required to be included in the Change Appraisal.
- 3.6 At the same time as issuing a Change Appraisal Instruction under paragraph 3.3, the Purchaser may issue a Change Confirmation Notice instructing the Manufacturer to proceed with any preliminary works or advance works identified in the Initial Change Appraisal in accordance with paragraph 2.1(c)(i) and/or (ii). The cost of any such works shall be included in the quotation included in the Change Appraisal and agreed or determined in accordance with paragraph 6 (Implementation of Purchaser Change). In the event of any Dispute in respect of the extent of such surveys or works, either Party may refer the matter for resolution under the Dispute Resolution Procedure.

4. **Change Appraisal**

- 4.1 Following the issue of a Change Appraisal Instruction, the Manufacturer shall deliver a written report (a **"Change Appraisal"**) to the Purchaser within 20 Working Days.
- 4.2 The Change Appraisal shall set out:
- (a) the Manufacturer's detailed assessment of the matters referred to in paragraphs 2.1(b) to 2.1(j) and any other impact of the proposed Purchaser Change on the provision of the Works;

- (b) whether relief from compliance with obligations is required, including the obligations of the Manufacturer to achieve the Provisional Acceptance of a Train by no later than the Train Longstop Date in relation to the relevant Fleet of which the Train forms part;
- (c) any amendments required to this Agreement (including any amendments to the Train Technical Requirements), or to the FSA as a result of the proposed Purchaser Change;
- (d) any Relevant Approvals which are required in order to implement the proposed Purchaser Change, any assistance which the Manufacturer anticipates it will require from the Purchaser in order to obtain such Relevant Approvals, and whether the proposed Purchaser Change will invalidate any Relevant Approval or make the obtaining of any Relevant Approval more onerous for the Manufacturer;
- (e) the proposed method of certification of any design, construction or operational aspects of the Works required by the proposed Purchaser Change if not covered by the procedures specified in this Agreement;
- (f) a Fixed Price Quotation, which will include a breakdown of such quotation identifying separately (without double counting):
 - (i) each Change in Costs; and
 - (ii) any impact on the Milestone Payments;
- (g) the Manufacturer's proposed Schedule of Payments to take account of the aggregate cost (or saving) of implementing the proposed Purchaser Change and/or any adjustment to the Milestone Payments;
- (h) amendments that need to be made to the quantity and rate of consumption of Base Order Warranty Spares, Base Order Purchaser Fault Spares and/or Base Order Maintenance Spares;
- (i) amendments that need to be made to the Train Financial Models;
- (j) amendments that need to be made to the Bill of Materials;
- (k) amendments that need to be made to the Technical Documents; and
- (l) the Manufacturer's proposed amendments to the Advance Payment Bond and/or Guarantee, or, where the Guarantee is not being amended, a confirmation that the Guarantee will be reaffirmed,

taking into account, in the case of a Change Appraisal issued in relation to a Base Order Option Notice or a WLO Additional Trains Option Notice, the matters set out in Part E: (Base Order Option Train Changes and WLO Additional Trains Changes).

- 4.3 The Manufacturer shall ensure in respect of any Change Appraisal that the Change in Costs is calculated in accordance with Appendix 2 (Calculation of Change in Costs) of this schedule 12.

5. **Procedure Following Submission of a Change Appraisal**

- 5.1 The Purchaser may request that the Manufacturer provide any further evidence or information in respect of the matters referred to at paragraphs 4.2 and 4.3 and notify the Manufacturer whether it wishes to amend the proposed Purchaser Change providing full details of any proposed amendment in which case the Manufacturer shall submit an

amended Change Appraisal within 20 Working Days of such notification or such longer period as is agreed between the Parties.

- 5.2 All evidence and information provided by the Manufacturer or its Subcontractors in response to a request under paragraph 5.1 shall be provided on an open book basis on the basis of the principles set out in schedule 15 (Open Book Accounting) and the Purchaser shall be entitled, subject to providing reasonable notice, to enter the offices of the Manufacturer and/or its Key Subcontractors for the purposes of auditing, inspecting and copying documentation (using facilities at the Manufacturer's or its Key Subcontractors' offices at no charge to the Purchaser) relating to any costings, claims of expenditure or losses incurred or likely to be incurred, estimates and quotations relevant to the proposed Purchaser Change.
- 5.3 Subject to paragraph 5.4, if the Parties cannot agree on the contents of the Change Appraisal (other than any element which forms part of the Manufacturer Cost Proposal for which the provisions of paragraph 6 (Implementation of Purchaser Change) shall apply), then either Party may refer the Dispute for resolution under the Dispute Resolution Procedure.
- 5.4 As soon as practicable, and in any event within 40 Working Days after, the contents of the Change Appraisal (other than any outstanding issues in relation to the Manufacturer Cost Proposal as referred to in paragraph 6 (Implementation of Purchaser Change)) have been agreed in accordance with paragraph 5.1 or determined in accordance with paragraph 5.3, the Purchaser shall either:
- (a) issue a Change Confirmation Notice, instructing the Manufacturer to proceed with the implementation of the Purchaser Change or a part of the Purchaser Change in accordance with paragraph 6 (Implementation of Purchaser Change); or
 - (b) withdraw the Purchaser Change Notice.

If the Purchaser has not issued a Change Confirmation Notice within such 40 Working Day period, then the Purchaser Change Notice shall be deemed to have been withdrawn.

6. **Implementation of Purchaser Change**

- 6.1 A Change Confirmation Notice issued by the Purchaser pursuant to paragraph 3.6 or paragraph 5.4(a) shall state:
- (a) whether the Purchaser accepts:
 - (i) the Fixed Price Quotation;
 - (ii) the Manufacturer's proposed Schedule of Payments and/or adjustments to the Milestone Payments proposed in accordance with paragraph 4.2(g); and
 - (iii) any other proposal relating to the costs of or savings arising from the implementation of the Purchaser Change including costs that can be calculated using the Schedule of Costs,

each as included in the Initial Change Appraisal or the Change Appraisal, as the case may be (the "**Manufacturer Cost Proposal**"); and
 - (b) if the Purchaser states in accordance with paragraph 6.1(a) that it does not accept the Manufacturer Cost Proposal, whether the Purchaser requires the Manufacturer to proceed with the Purchaser Change or any part of the Purchaser Change either:
 - (i) immediately following issue of the Change Confirmation Notice or such other date specified in the Change Confirmation Notice notwithstanding that the

Parties have not reached final agreement in respect of the Manufacturer Cost Proposal; or

- (ii) immediately following agreement or determination in respect of the Manufacturer Cost Proposal in accordance with paragraph 6.4.

6.2 A Change Confirmation Notice issued by the Purchaser pursuant to paragraphs 3.6 or 5.4(a) shall attach a copy of or otherwise reference, as applicable:

- (a) the Initial Change Appraisal;
- (b) the instructions issued in accordance with paragraph 3.6;
- (c) the Change Appraisal which shall be in agreed form other than in respect of any issues relating to the Manufacturer Cost Proposal or which remain to be agreed or determined under this paragraph 6;
- (d) the Train Financial Models, updated in order to reflect the Purchaser Change;
- (e) an updated schedule 8 (Spares and Special Tools) to reflect the updated number of Base Order Warranty Spares, Base Order Purchaser Fault Spares and/or Base Order Maintenance Spares;
- (f) the Bill of Materials, updated and delivered to the Purchaser in accordance with clause 10.5(a); and
- (g) the Technical Documents, updated and delivered to the Purchaser in accordance with paragraph 1 of schedule 28 (Technical Information).

6.3 A Change Confirmation Notice shall have the effect of varying the relevant Train Technical Requirements or any other term of this Agreement to the extent provided in the agreed Initial Change Appraisal, the agreed instructions issued in accordance with paragraph 3.6 or the agreed Change Appraisal, as applicable, with effect from the date of receipt by the Manufacturer of the Change Confirmation Notice or such other date specified in the Change Confirmation Notice. As soon as practicable after such date the Manufacturer shall implement the Purchaser Change or part of the Purchaser Change and shall be bound by this Agreement in so doing as if the Purchaser Change or relevant part of the Purchaser Change formed part of the relevant Train Technical Requirements or other terms of this Agreement.

6.4 If the Purchaser states in the Change Confirmation Notice that it does not agree with the Manufacturer Cost Proposal, then:

- (a) the Parties shall endeavour to reach agreement in respect of the cost (or saving) of implementing the Purchaser Change; and
- (b) the Purchaser may request any additional information of the type referred to in paragraph 4.3 and in providing such information the provisions of paragraph 5.2 shall apply mutatis mutandis.

If the Parties fail to reach agreement within 20 Working Days of the issue of the Change Confirmation Notice, then either Party may refer the matter for resolution under the Dispute Resolution Procedure. Notwithstanding any other provision of this Part B, the Manufacturer shall not be entitled to any compensation in connection with a Purchaser Change save to the extent that such compensation directly arises from such Purchaser Change.

6.5 The Manufacturer Cost Proposal accepted in accordance with paragraph 6.1(a) or agreed or determined in accordance with paragraph 6.4 shall be binding on both Parties in full

and final settlement of all costs incurred by the Manufacturer and any impact (whether arising directly or indirectly as a result of the Purchaser Change) on the relevant Milestone Payments and any other sum to be calculated pursuant to schedule 10 (Milestones and Security) notwithstanding that the actual costs or impact may be greater or less than the Manufacturer Cost Proposal accepted, agreed or determined as the case may be.

- 6.6 In implementing any Purchaser Change, the Manufacturer shall comply with, as applicable:
- (a) the certification procedures for Trains and Equipment set out in this Agreement; or
 - (b) the method of certification specified in the agreed Change Appraisal in accordance with paragraph 4.2(e).
- 6.7 The Manufacturer shall maintain and make available any records relating to a Purchaser Change in accordance with this Agreement.
- 6.8 The Manufacturer shall:
- (a) where required, within ten (10) Working Days of the Change Confirmation Notice provide an amended and/or restated Advance Payment Bond (in relation to each relevant Fleet affected by the Change Confirmation Notice) and/or Guarantee; and
 - (b) in relation to any Change where an amended Guarantee is not required provide a restated Guarantee.

7. Payments by the Purchaser

- 7.1 Any Schedule of Payments proposed by the Manufacturer in accordance with paragraph 2.2(b) or 4.2(g) shall:
- (a) set out any amendments to the relevant Milestone Payments;
 - (b) set out the timing of the payments to be made by the Purchaser in respect of the net cost (if any) for implementing the proposed Purchaser Change (as quoted or estimated pursuant to paragraphs 2.1(e) and 2.2(a), or paragraphs 4.2(f) and 4.2(g), as applicable); and
 - (c) in respect of the payments referred to in paragraphs 7.1(a) and 7.1(b) identify those payments which relate to the carrying out of, or specific progress towards, an element within the Purchaser Change and, in respect of each such payment, specify the evidence which the Manufacturer will provide in order to confirm that the part of the Purchaser Change corresponding to each occasion when payment is due has been duly carried out.
- 7.2 Where the Manufacturer Cost Proposal (accepted in accordance with paragraph 6.1(a) or agreed or determined in accordance with paragraph 6.4) requires the Purchaser to make one or more payments to the Manufacturer by reference to a Schedule of Payments (other than amendments to the relevant Milestone Payments), the Purchaser shall make any such payment within 30 Working Days of receipt by the Purchaser of an invoice (complete in all material respects) in accordance with the agreed Schedule of Payments accompanied by relevant evidence (where applicable) that the relevant part of the Purchaser Change has been carried out.
- 7.3 Where the Manufacturer Cost Proposal (accepted in accordance with paragraph 6.1(a) or agreed or determined in accordance with paragraph 6.4) includes amendments to the relevant Milestone Payments, the payments will be made in accordance with the provisions of schedule 10 (Milestones and Security) (in the case of Whole Line Options, as amended by schedule 25 (Whole Line Options)).

- 7.4 If payment is not made in accordance with paragraph 7.2 or 7.3, the Purchaser shall pay to the Manufacturer interest at the Default Rate on the amount unpaid from the date 30 Working Days after receipt of the relevant invoice until settlement of such payment.
- 7.5 Once a Change Confirmation Notice has been issued by the Purchaser in relation to an Emergency Change (if any), the Parties shall ensure that the Schedule of Payments provides for a reconciliation of any discrepancy between the Emergency Change Interim Payments made by the Purchaser pursuant to paragraph 1.4 and the actual incremental costs, fees and expenses reasonably and properly incurred by the Manufacturer (and accounted for) in relation to the implementation of the Emergency Change during the period from the relevant Purchaser Change Notice issued pursuant to paragraph 1.2 and prior to the Purchaser's Change Confirmation Notice.

Part C: Manufacturer Changes

1. Manufacturer Change Notice

- 1.1 If the Manufacturer wishes to introduce a change to any of the relevant Train Technical Requirements ("**Manufacturer Change**"), it must serve a notice in writing on the Purchaser ("**Manufacturer Change Notice**") which shall:
- (a) set out the proposed Manufacturer Change in sufficient detail to enable the Purchaser to evaluate it in full including providing information equivalent to that provided in respect of a Purchaser Change pursuant to paragraph 2 (Initial Change Appraisal) or paragraph 4 (Change Appraisal) of Part B: (Purchaser Changes) of this schedule 12;
 - (b) specify the Manufacturer's reasons for proposing the proposed Manufacturer Change;
 - (c) request the Purchaser to consult with the Manufacturer with a view to deciding whether to agree to the Manufacturer Change and, if so, what consequential changes the Purchaser requires as a result;
 - (d) indicate any implications of the proposed Manufacturer Change (including impact on reliability, design life, operating concept and interfaces including on ICDs); and
 - (e) indicate if there are any dates by which a decision by the Purchaser is critical.

2. Evaluation of Manufacturer Change

- 2.1 The Purchaser shall evaluate the proposed Manufacturer Change in good faith, taking into account all relevant issues, including whether:
- (a) the Purchaser will be required to make a change in the relevant Milestone Payments or to make any other payment;
 - (b) the change affects the quality of the Works or the likelihood of successful delivery of the Works;
 - (c) the change will alter the relationship of the Purchaser with third parties (including with PDPs);
 - (d) the financial strength of the Manufacturer is sufficient to perform the proposed Manufacturer Change, taking into account the Advance Payment Bond and Guarantee;
 - (e) the impact on the design life of the Trains;
 - (f) the change materially affects the risks or costs to which the Purchaser is exposed; and
 - (g) the change makes the exercise of any Whole Line Option by the Purchaser less attractive.
- 2.2 The Purchaser cannot reject a Manufacturer Change which is required in order to conform to a Change in Law. The costs of introducing a Manufacturer Change and other effects resulting from a Qualifying Change in Law (including any resulting variation in any Milestone Payments) shall be dealt with in accordance with clause 28 (Change in Law) and, to the extent not so dealt with, shall be borne by the Manufacturer.

3. **Procedure Following Submission of a Manufacturer Change Notice**

- 3.1 As soon as practicable after receiving the Manufacturer Change Notice, if requested by either Party, the Parties shall meet and discuss the matters referred to in such notice. During their discussions the Purchaser may propose modifications or (acting in its absolute discretion) accept or reject the Manufacturer Change Notice.
- 3.2 If the Purchaser accepts the Manufacturer Change Notice (with or without modification), the Parties shall, as soon as practicable after the Purchaser's acceptance:
- (a) agree and enter into any documents to amend this Agreement, the FSA or any other relevant document which are necessary to give effect to the Manufacturer Change; and
 - (b) implement the Manufacturer Change.
- 3.3 If the Purchaser rejects the Manufacturer Change Notice, it shall not be obliged to give its reasons for such a rejection.

4. **Payment Adjustment**

- 4.1 Unless the Purchaser's acceptance specifically agrees to an increase in the relevant Milestone Payments or other payments under this Agreement, there shall be no increase in such payments as a result of a Manufacturer Change.
- 4.2 If the Manufacturer Change causes or will cause the Manufacturer's costs or those of a Subcontractor to decrease, the Milestone Payments or other payments shall be reduced accordingly.
- 4.3 Following agreement to any adjustment to the relevant Milestone Payments pursuant to this Part C, the relevant Schedule of Milestones shall be updated.

Part D: Compensation Changes

1. Compensation / Relief Claim

- 1.1 As soon as practicable and in any event within 15 Working Days after the Manufacturer is aware that a Compensation Event has caused or is likely to cause any of the consequences referred to in clause 17.7 (Occurrence of a Compensation Event), the Manufacturer shall give to the Purchaser a notice of its claim (an **"Initial Claim Appraisal"**), which shall set out the opinion of the Manufacturer on:
- (a) the Manufacturer's initial assessment of any impact of the proposed Compensation Event on any of the dates or activities referred to in the relevant Project Programme and/or Key Programme Dates, the Contractual Provisional Acceptance Dates, the Contractual Final Acceptance Dates and the Contractual Fleet Acceptance Dates;
 - (b) the Manufacturer's initial assessment of the scope of any changes to the Works, the Trains or the Equipment;
 - (c) without prejudice to paragraph 3 (Changes to FSA) of Part A: (General) of this schedule 12, the Manufacturer's initial assessment of the impact of the proposed Compensation Event on the FSA; and
 - (d) the Manufacturer's estimate, acting in good faith, of all Change in Costs under this Agreement that are associated with the proposed Compensation Event, identifying separately each Change in Cost with such estimate.
- 1.2 The Manufacturer's estimate referred to in paragraph 1.1(d) of this Part D: shall include:
- (a) in respect of any capital works arising from the Compensation Event, a Fixed Price Quotation determined by reference to the Schedule of Costs;
 - (b) details of those effects of the Compensation Event which are not covered by the Fixed Price Quotation provided under sub-paragraph 1.2(a) and for which the cost can be determined by reference to the Schedule of Costs; and
 - (c) the Manufacturer's proposed Schedule of Payments (which may, if appropriate, consist of a single lump sum payment) to take account of the Change in Costs of the Compensation Event.
- 1.3 In the event that the information is provided after the timescales referred to in paragraph 1.1 then the Manufacturer shall not be entitled to compensation and/or relief from its obligations under this Agreement to the extent that the amount of such compensation and/or required relief has been increased as a result of such delay in providing such information.
- 1.4 The Manufacturer shall, without prejudice to its obligations in this Agreement and in accordance with the standard expected of a competent contractor involved in designing and manufacturing rolling stock acting in accordance with Good Industry Practice, use its reasonable endeavours to mitigate any adverse effects of a Compensation Event.

2. Procedure for Submission of an Initial Claim Appraisal

- 2.1 Within 15 Working Days after receipt of the Initial Claim Appraisal, the Purchaser may issue a Claim Confirmation Notice in accordance with paragraph 5 (Agreement of Claim) of this Part D: or issue an instruction for the Manufacturer to provide a Claim Appraisal in respect of the Compensation Event (a **"Claim Appraisal Instruction"**).
- 2.2 A Claim Appraisal Instruction provided by the Purchaser under paragraph 2.1 shall:

- (a) state whether the Purchaser requires the Manufacturer to submit to it a Fixed Price Quotation in respect of the effects of the Compensation Event or any part of the Compensation Event;
- (b) include any additional information in respect of a Compensation Event which the Purchaser requires the Manufacturer to consider when making the Claim Appraisal; and
- (c) specify any reporting format, breakdown of quotations or any other matters specifically required to be included in the Claim Appraisal.

3. **Claim Appraisal**

3.1 Following the issue of Claim Appraisal Instruction the Manufacturer shall deliver a written report (a "**Claim Appraisal**") to the Purchaser within 15 Working Days.

3.2 The Claim Appraisal shall set out:

- (a) the Manufacturer's detailed assessment of the matters referred to in paragraphs 1.1(a) to (d) of this Part D: and any other impact of the Compensation Event on the provision of the Trains or the Equipment;
 - (b) whether relief from compliance with obligations is required including the obligations of the Manufacturer to achieve the relevant Provisional Acceptance of a Train by no later than the Train Longstop Date (in relation to the relevant Fleet of which the Trains form part), and the proposed postponement of such date by such time as shall be reasonable in the circumstances;
 - (c) any amendments required to this Agreement (including any amendments to the Train Technical Requirements), the FSA or any other relevant document as a result of the Compensation Event;
 - (d) where the Claim Appraisal Instruction specifies that a Fixed Price Quotation must be provided, the amount of such Fixed Price Quotation and a breakdown of such quotation identifying separately (without double counting):
 - (i) each Change in Costs; and
 - (ii) any impact on the relevant Milestone Payments; and
 - (iii) any amount included in such estimate to take account of contingencies and risks associated with paragraphs (i) and (ii) above;
 - (e) insofar as not covered by a Fixed Price Quotation provided under paragraph 3.2(d):
 - (i) an estimate of each of the items set out in paragraphs 3.2(d) (i) and (ii); and
 - (ii) details of any of the amounts referred to in paragraph (i) above which can be determined by reference to the Schedule of Costs; and
 - (f) the Manufacturer's proposed Schedule of Payments to take account of the aggregate cost (or savings) of the Compensation Event and/or any adjustment to the relevant Milestone Payments.
- 3.3 The Manufacturer shall ensure in respect of any Claim Appraisal that:
- (a) the Change in Costs are calculated in accordance with Appendix 2 (Calculation of Change in Costs) of this schedule 12;

- (b) that any Fixed Price Quotation or change to the relevant Milestone Payments reflects prevailing market rates applicable to the circumstance of the quotation; and
- (c) that it has used its best endeavours to oblige its Subcontractors to minimise any increase in cost and maximise any reduction in costs.

4. **Procedure Following Submission of Claim Appraisal**

- 4.1 As soon as practicable after the Purchaser receives the Claim Appraisal, the Parties shall discuss and endeavour to agree, acting reasonably, the matters set out in the Claim Appraisal. During such discussions, the Purchaser may request that the Manufacturer provide any further evidence or information in respect of the matters referred to in paragraph 3.3.
- 4.2 All evidence and information provided by the Manufacturer or its Subcontractors in response to requests under paragraph 4.1 shall be provided on an open book basis on the basis of the principles set out in schedule 15 (Open Book Accounting), and the Purchaser shall be entitled, subject to providing reasonable notice, to enter the offices of the Manufacturer for the purpose of auditing, inspecting and copying documentation (using facilities at the Manufacturer's office at no charge to the Purchaser) relating to any costs, claims of expenditure or losses incurred or likely to be incurred, estimates and quotations relevant to the Compensation Event.
- 4.3 If the Parties cannot agree on the contents of the Claim Appraisal (other than any element which forms part of the Manufacturer Compensation Proposal for which the provisions of paragraph 5 (Agreement of Claim) shall apply), then either Party may refer the Dispute for resolution under the Dispute Resolution Procedure and such compensation shall be determined on the basis of what would be reasonable for such a Compensation Event.
- 4.4 As soon as practicable, and in any event within 20 Working Days after the contents of the Claim Appraisal (other than any outstanding element relating to the Manufacturer Compensation Proposal as referred to in paragraph 5 (Agreement of Claim)) have been agreed in accordance with paragraph 4.1 or determined in accordance with paragraph 4.3, the Purchaser shall issue a Claim Confirmation Notice setting out the matters which have been agreed or determined.

5. **Agreement of Claim**

- 5.1 A Claim Confirmation Notice issued by the Purchaser pursuant to paragraph 2.1 or 4.4 shall state:
 - (a) whether the Purchaser accepts:
 - (i) in the case of a Claim Confirmation Notice issued under paragraph 2.1:
 - (A) the Fixed Price Quotation; and
 - (B) the Manufacturer's proposed Schedule of Payments (which may, if applicable consist of a single lump sum payment),

each as included in the Initial Claim Appraisal (where applicable, as amended in accordance with paragraph 4 (Procedure Following Submission of a Claim Appraisal)); or
 - (ii) in the case of a Claim Confirmation Notice issued under paragraph 4.4:
 - (A) the Fixed Price Quotation;

(B) the Manufacturer's proposed Schedule of Payments and/or adjustments to the relevant Milestone Payments proposed in accordance with paragraph 3.2(f); and

(C) any other proposal relating to the costs of or savings arising from the Compensation Event,

each as included in the Claim Appraisal,

(in each case, the **"Manufacturer Compensation Proposal"**); and

(b) if the Purchaser states in accordance with paragraph 5.1(a) that it does not accept the Manufacturer Compensation Proposal, the reasons for not so doing.

5.2 A Claim Confirmation Notice issued by the Purchaser pursuant to paragraph 2.1 or 4.4 of this Part D: shall attach a copy of or otherwise reference the relevant parts of the Initial Claim Appraisal or the Claim Appraisal, as applicable, and shall be in agreed form other than in respect of any issues relating to the Manufacturer Compensation Proposal which remain to be agreed or determined under this paragraph 5.

5.3 Subject to paragraph 5.6, a Claim Confirmation Notice shall have the effect of varying the relevant Train Technical Requirements or postponing the relevant longstop dates in the relevant Key Programme Dates or any other term of this Agreement to the extent provided in the agreed Initial Claim Appraisal or the agreed Claim Appraisal, as applicable, with effect from the date of receipt by the Manufacturer of the Claim Confirmation Notice or such other date specified in the Claim Confirmation Notice.

5.4 If the Purchaser states in the Claim Confirmation Notice that it does not agree with the Manufacturer Compensation Proposal, then:

(a) the Parties shall endeavour to reach agreement in respect of the cost (or saving) of the Compensation Event; and

(b) the Purchaser may request any additional information of the type referred to in paragraph 4.1 and in providing such information the provisions of paragraph 4.2 shall apply mutatis mutandis.

If the Parties fail to reach agreement within 20 Working Days of the issue of the Claim Confirmation Notice, then either Party may refer the matter for resolution under the Dispute Resolution Procedure.

5.5 The Manufacturer Compensation Proposal accepted in accordance with paragraph 5.1(a) or agreed or determined in accordance with paragraph 5.4 shall be binding on both Parties in full and final settlement of all costs incurred by the Manufacturer and any impact (whether arising directly or indirectly as a result of the Compensation Event) on the relevant Milestone Payments and any other sum to be calculated pursuant to schedule 10 (Milestones and Security) notwithstanding that the actual costs or impact may be greater or less than the Manufacturer Compensation Proposal accepted, agreed or determined as the case may be.

5.6 The Manufacturer shall maintain and make available any records relating to a Compensation Event in accordance with this Agreement.

6. **Payments by the Purchaser**

6.1 Any Schedule of Payments proposed by the Manufacturer in accordance with paragraphs 1.2(c) or 3.2(f) of this Part D: shall:

(a) set out any amendments to the relevant Schedule of Milestones;

- (b) set out the timing of the payments to be made by the Purchaser in respect of the net cost (if any) for dealing with the Compensation Event (as quoted or estimated pursuant to paragraphs 1.1(d) and 1.2(a), or paragraphs 3.2(e) and 3.2(f), as applicable); and
 - (c) in respect of the payments referred to in paragraphs 6.1(a) and 6.1(b), identify those payments which relate to the carrying out of, or specific progress towards, dealing with any element of the Compensation Event and, in respect of each such payment, specify the evidence which the Manufacturer will provide in order to confirm that the relevant part of the Compensation Event corresponding to each occasion when payment is due has been duly dealt with.
- 6.2 Where the Manufacturer Compensation Proposal (accepted in accordance with paragraph 5.1(a) or agreed or determined in accordance with paragraph 5.4) requires the Purchaser to make one or more payments to the Manufacturer by reference to a Schedule of Payments (other than amendments to the relevant Schedule of Milestones), the Purchaser shall make any such payment within 30 Working Days of receipt by the Purchaser of an invoice (complete in all material respects) in accordance with the agreed Schedule of Payments accompanied by the relevant evidence (where applicable) that the relevant part of the Compensation Event has been dealt with.
- 6.3 Where the Manufacturer Compensation Proposal (accepted in accordance with paragraph 5.1(a) or agreed or determined in accordance with paragraph 5.4)) includes amendments to the Schedule of Milestones, the payments will be made in accordance with the provisions of schedule 10 (Milestones and Security) (and, in relation to any Whole Line Options, as amended by schedule 25 (Whole Line Options)).
- 6.4 If payment is not made in accordance with paragraph 6.2 or 6.3, the Purchaser shall pay to the Manufacturer interest at the Default Rate on the amount unpaid from the date 30 Working Days after receipt of the relevant invoice until payment.

Part E: Base Order Option Train Changes and WLO Additional Trains Changes**1. Required Terms**

If the Purchaser delivers a Base Order Option Notice or WLO Additional Trains Option Notice, the Manufacturer shall, without prejudice to the generality of its obligations under this Agreement, unless the Purchaser agrees otherwise, prepare its Initial Change Appraisal and Change Appraisal in response to that Base Order Option Notice or WLO Additional Trains Option Notice, as the case may be, on the basis of the following principles:

- (a) the Change in Costs in relation to the proposed Base Order Option Train Change or WLO Additional Trains Change shall be consistent with the Base Order Option Prices (or WLO Additional Trains Option Prices set out in Table 1 of paragraph 1, 2 or 3 of Appendix 4 to schedule 25 (Whole Line Options) in relation to the relevant Whole Line Option);
- (b) the Manufacturer will comply with its obligations under paragraph 1.9 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security) (and as amended by schedule 25 (Whole Line Options) in relation to any Whole Line Option);
- (c) the Schedule of Payments in relation to the proposed Base Order Option Train Change and WLO Additional Trains Change shall not require the payment by the Purchaser of more than 30 per cent of the applicable Base Order Option Price or WLO Additional Trains Option Price before Acceptance of the relevant Train or Equipment;
- (d) the first of the relevant Trains is to be delivered to the Purchaser for Acceptance no later than a date which, bearing in mind the date of the Base Order Option Notice or the WLO Additional Trains Option Notice (as the case may be), would put the Purchaser in no worse a position than for the delivery of the Base Order under the Project Programme;
- (e) for the avoidance of doubt, clause 7.15(i) shall apply; and
- (f) the programmed dates for the delivery of such Trains for Acceptance shall be such that, taking into account the cumulative effect of deliveries of Trains comprising the Base Order or WLO Base Order (if applicable) and the Base Order Option Trains or WLO Additional Trains, as the case may be, the delivery rate of Trains will not at any time exceed four (4) Trains per TfL Period.

Appendix 1

Schedule of Costs

To the extent that an Initial Change Appraisal or a Change Appraisal agreed in accordance with Part B: (Purchaser Changes) or Part D: (Compensation Changes) of this schedule 12 states that any costs are to be agreed by reference to the Schedule of Costs, then such costs shall be determined as follows:

1. **Staff Costs**

1.1 **Professional and other monthly paid staff**

The cost of professional and other monthly paid staff of the Manufacturer or its Subcontractors working directly on the design or manufacture of any Works required by a Purchaser Change shall be recoverable on a time basis as follows:

$(\text{Basic Annual Salary} / 1600) \times \text{Actual Hours Worked} \times \text{On-Cost Multiplier A}$

Where:

Basic Annual Salary means the annual salary excluding overtime and bonuses during the period covered by the account. Where the annual salary is changed during the period covered by the account, the total worked should be apportioned and applied to the relevant salary level;

Actual Hours Worked means actual hours worked including overtime hours; and

On-Cost Multiplier A is the factor required to recover the appropriate part of the annual salary and on-costs. The multiplier to be used for this paragraph 1.1 is ■■■■. The on-costs deemed to be covered by On-Cost Multiplier A include (i) the costs of general management and accountancy, support staff, secretarial and administration staff and the like, (ii) the costs of normal office overheads and profit, and (iii) all contributions and payments made by the employer for staff pension and life assurance schemes and for National Insurance, and any tax, charge, levy, impost or payment of any kind which the employer is obliged by law to make on behalf of or in respect of the relevant employee.

1.2 **Agency or sub-consultant staff (based in the offices of the Manufacturer or its Subcontractors)**

The cost of agency or sub-consultant staff working directly on the design or manufacture of any Works required by a Purchaser Change who are not direct employees of any of the Manufacturer or its Subcontractors but are based in the offices of the Manufacturer or its Subcontractors shall be recoverable on a time basis as follows:

$\text{Hourly Cost} \times \text{Actual Hours Worked} \times \text{On-Cost Multiplier B}$

Where:

Hourly Cost means the hourly cost paid to an agency or sub-consultant in respect of named individual professionals;

Actual Hours Worked means actual hours worked; and

On-Cost Multiplier B is the factor required to recover the appropriate part of the Manufacturer's and Key Subcontractor's on-costs. The multiplier to be used for this paragraph 1.2 is ■■■■. The on-costs deemed to be covered by On-Cost Multiplier B include (i) the costs of general management and accountancy, support staff, secretarial

and administration staff and the like; and (ii) the costs of normal office overheads and profit.

1.3 **Agency or sub-consultant staff (based in their own offices)**

The cost of agency or sub-consultant staff working directly on the design or manufacture of any Works required by a Purchaser Change who are not direct employees of any of the Manufacturer or its Key Subcontractors and are based in their own offices shall be recoverable on a time basis as follows:

Hourly Cost x Actual Hours Worked x On-Cost Multiplier C

Where:

Hourly Cost means the hourly cost paid to an agency or sub-consultant in respect of named individual professionals;

Actual Hours Worked means actual hours worked including overtime hours; and

On-Cost Multiplier C is the factor required to recover the appropriate part of the Manufacturer's and the Key Subcontractor's on-costs. The multiplier to be used for this paragraph 1.3 is [REDACTED]. The on-costs deemed to be covered by On-Cost Multiplier C include (i) the costs of general management and accountancy, support staff, secretarial and administration staff and the like; and (ii) profit.

1.4 **Miscellaneous**

- (a) Time spent in travelling for the purposes of the Purchaser Change to be performed under this Schedule of Costs shall be chargeable, excluding travel between home and normal work place.
- (b) Time spent by staff engaged in general accountancy, secretarial or administration duties (unless otherwise agreed) shall not be chargeable.
- (c) In addition to the fee described in paragraphs 1.1, 1.2 and 1.3 above, the Manufacturer shall be reimbursed by the Purchaser for all approved costs and expenses properly incurred by it in connection with the Purchaser Change to be performed under this Schedule of Costs and certified by the Manufacturer in respect of:
 - (i) an appropriate portion of travel and subsistence expenses paid to employees, agency staff or sub-consultant staff as the case may be;
 - (ii) the cost of printing and reproduction of all documents, drawings, maps and records and the like authorised by the Purchaser;
 - (iii) the cost of providing, where required by the Purchaser, auditors' certificates of costs; and
 - (iv) the cost of any other expenses authorised by the Purchaser, excluding normal office overheads such as rent, rates, heating, lighting, telephone and postal charges.
- (d) For the purposes of this Schedule of Costs, approved means approved in writing by the Purchaser before the cost, remuneration or expenditure in question is incurred or committed.

Appendix 2

Calculation of Change in Costs

1. Principles

1.1 The Manufacturer shall ensure that the Change in Costs is calculated on the following principles:

- (a) the costs shall reflect prevailing market rates applicable to the circumstances of the quotation and on an open book basis on the basis of the principles set out in schedule 15 (Open Book Accounting);
- (b) the Manufacturer shall use its best endeavours to oblige its Subcontractors to minimise any increase in costs and maximise any reduction in costs;
- (c) the Manufacturer shall demonstrate how any expenditure to be incurred or avoided is being measured in a cost effective manner including showing that when such expenditure is incurred foreseeable Changes in Law at that time have been taken into account;
- (d) the Manufacturer shall ensure that the Changes in Costs take account of any reduction in expenditure incurred to replace or maintain assets which was originally anticipated but would be avoided as a result of implementing the Change or Relevant Event;
- (e) the Manufacturer shall demonstrate that where Key Subcontractors have sourced parts or materials from within their respective group undertaking (as such term is defined in section 1161 of the Companies Act 2006) that no mark-up has been added to such parts or material.

2. Margin

The only margin which may be added to the costs calculated above is as set out in Appendix 3 (Manufacturer's Margin) to this schedule 12.

3. Compensation Events

Where the Relevant Event is a Compensation Event, only Direct Losses shall be taken into account in the calculation of Changes in Costs.

Appendix 3

Manufacturer's Margin

1. The following percentage uplifts shall be applied to quotations and estimates (or parts of the same) of the direct costs and savings resulting from implementation of proposals for any Purchaser Change as calculated in accordance with Appendix 2 (Calculation of Change in Costs) to this schedule 12.
2. Each percentage shall be deemed to include all of the Manufacturer's additional or reduced overheads including the costs of management, administration, legal accountancy, head office overheads and charges, supervision, insurance, accommodation, provision of small tools, standard items of plant, protective clothing, general contingency, general manufacturing and/or risk and profit resulting from the Purchaser Change.
3. For the avoidance of doubt, the percentages obtained from this Appendix 3 are not applicable to any quotation, estimate or price obtained by reference to the Schedule of Costs included in Appendix 1 to this schedule 12.

Element of Purchaser Change quotation or estimate	Net increase or decrease in direct costs per cent

Increase or decrease in Capital Expenditure excluding the Works	■

Increase or decrease in the cost of implementing the Works	■

SCHEDULE 13

Insurance

- Part A: Manufacturer Obligations
- Part B: Insurance required from the Commencement Date in respect of the Works
- Part C: Insurance required for the Train Warranty Period
- Part D: Broker's Letter of Undertaking
- Part E: Endorsements

Part A: Manufacturer Obligations

1. Required Manufacturer Insurances

- 1.1 The Manufacturer shall take out and maintain in full force and effect and at its own cost, the following policies and contracts of insurance (the **"Required Insurances"**):
- (a) all risks property insurance for an amount not less than the full replacement cost any one occurrence with no aggregate limit against any loss or damage (however and wherever it arises including in transit during testing) to each item of the Insured Property described in (i) paragraph 2.1 of Part B: (Insurance required from the Commencement Date in respect of the Works) and (ii) paragraph 2.1 of Part C: (Insurance required for the Train Warranty Period);
 - (b) public and product liability insurance in respect of the Manufacturer's liability for death or injury to any person (other than employees of the Manufacturer) and loss or damage to any property (excluding, in relation to paragraph 3 of Part B: but not paragraph 3 of Part C:, the Trains and Equipment) in an amount of not less than £155,000,000 (or such other sum as may be required by the Office of Rail and Road or its successor for operators of railway assets) in respect of each and every occurrence or series of occurrences consequent upon one event or original cause, and subject to at least one reinstatement for an annual period; and
 - (c) the professional indemnity insurance referred to in paragraph 4 of Part C: (Insurance required for the Train Warranty Period).
- 1.2 From the date of this Agreement until the expiry of all warranties provided by the Manufacturer pursuant to clause 20 (Warranties), the Manufacturer shall procure any other insurance as is required by any Applicable Laws and Standards including insurance to be effected against legal liability for injury to its employees and to other persons under a contract of service or apprenticeship to them (and shall procure that each Subcontractor shall maintain such insurance in respect of its own employees).

2. Requirements for All Risks Property Insurances

The all risks property damage Required Insurances described in paragraph 1.1(a) shall:

- (a) be in the name of the Manufacturer and will name each of the Purchaser, the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1) and any Financiers and their respective assigns as additional insureds for their respective rights and interests;

- (b) include a waiver of subrogation in favour of the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1), the Purchaser (if not the Owner) and any Financiers; and
- (c) comply with the provisions of paragraph 2 (Contractors' "All Risks" Insurance) of Part B: (Insurance required from the Commencement Date in respect of the Works) and paragraph 2 (Property Damage) of Part C (Insurance Required for the Train Warranty Period) of this schedule 13 for the Part B and Part C insurances respectively.

3. **Requirements for Third Party Liability Insurances**

The liability insurances specified in paragraph 1.1(b) shall:

- (a) be in the name of the Manufacturer and include the Purchaser, the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1), and any Financier and their respective successors and assigns as additional insureds for their respective rights, liabilities and interests (for the purposes of this paragraph 3, the **"Required Additional Insureds"**);
- (b) include a provision whereby the insurers agree to indemnify in terms of such insurances the Purchaser, the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1), and any Financier against legal liability in respect of which the Manufacturer is liable to indemnify such person under the terms of this Agreement;
- (c) include a waiver of subrogation in favour of the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1) and any Financiers;
- (d) contain a provision entitling any other Insured to initiate a claim under the relevant insurance in the event of refusal or failure by the Manufacturer to do so; and
- (e) comply with the provisions of with paragraph 3 (Third Party Public and Products Liability Insurance) of Part B: (Insurance Required from the Commencement Date in respect of the Works) and paragraph 3 (Third Party Public and Products Liability Insurance) of Part C (Insurance Required for the Train Warranty Period) of this schedule 13 for the Part B and Part C insurances respectively.

4. **Insurance to be in joint names and for several interest**

The Manufacturer shall ensure that each policy or contract of the Required Insurances (except for the PI Insurance) shall:

- (a) severally insure each of the Insureds named in paragraph 1 of Part B: (Insurance Required from the Commencement Date in respect of the Works) and paragraph 1 of Part C (Insurance Required for the Train Warranty Period) and, subject to the prior consent of the Purchaser, others nominated by the Manufacturer;
- (b) contain a multiple-insured clause providing that the insured under the policy are insured on a composite basis applying to each insured as if, save only for limits of liability and/or amount, they were separately and individually insured; and
- (c) contain a non-vitiating clause whereby the vitiating act of one insured party shall not prejudice the right to indemnity of any other insured which has an insurable interest and has not committed any vitiating act,

in the case of paragraphs (b) and (c), in the form of Endorsement 2 in Part E: (Endorsements) of this schedule 13, or such other terms as may be expressly approved by the Purchaser in accordance with paragraph 6.2.

5. Rights of subrogation

The parties shall procure that all Required Insurances under which the Purchaser, the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1) or Financiers in connection with the Project, are not named as an insured contain a term to the effect that the insurers have agreed to waive all rights of subrogation against such persons, in the form of Endorsement 2 in Part E: (Endorsements) of this schedule 13, or such other terms as may be expressly approved by the Purchaser in accordance with paragraph 6.2.

6. Terms of policies and insurers

6.1 Each policy of Required Insurance shall:

- (a) provide cover denominated in Sterling;
- (b) be in accordance with normal industry practice of persons engaged in the design, manufacture, testing, certification and commissioning of similar rolling stock, associated equipment and special tools in similar circumstances;
- (c) unless otherwise approved by the Purchaser in its absolute discretion, be placed and maintained with insurers with a Standard & Poor's Corporation long-term credit rating of at least A- (or an equivalent rating from another rating agency of equal repute) including replacing any insurer whose credit rating falls below such rating with an insurer that does meet such rating; and
- (d) be in such form and substance, consistent with the obligations of the Manufacturer under this Agreement as may be approved in writing from time to time by the Purchaser (such approval not to be unreasonably withheld or delayed).

6.2 No later than 15 Working Days prior to effecting any such policy or contract of insurance, the Manufacturer shall submit to the Purchaser and the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1) for its approval:

- (a) the identity of the proposed insurer(s); and
- (b) the principal terms, conditions and warranties of the proposed insurance (including extensions, exclusions and levels of deductibles) or any revision to such insurance.

7. Cancellation or limitation of cover

All Required Insurances shall contain an endorsement whereby the Purchaser and the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1) receives from the insurer in writing:

- (a) not less than 30 days' notice of cancellation or non-renewal for any reason;
- (b) not less than 30 days' notice of any reduction in limit or restriction in coverage or any increase in deductibles, whether at the instance of the insurer or the insured (which, in the case of any such reduction, restriction or increase required by the insured shall not be implemented without the agreement of the Purchaser (not to be unreasonably withheld));
- (c) advice of any default in payment of any premium payable under the policy; and

- (d) advice of any act or omission, including but not limited to known breaches of warranty, or of any event of which the insurer has knowledge and which might invalidate or render a policy void or voidable at the insurer's discretion,

in the form of Endorsement 1 in Part E: (Endorsements) of this schedule 13, or such other terms as may be expressly approved by the Purchaser in accordance with paragraph 6.2.

8. Loss Payee Provisions

8.1 All Required Insurances shall provide that claim proceeds, whether interim or final shall be paid to the Purchaser, or, at the Purchaser's discretion, to other parties and where such other party is the Manufacturer, the proceeds being released to the Manufacturer against its undertaking to reinstate such loss or damage with such supporting information as the Purchaser may reasonably require:

- (a) in respect of loss or damage to the Trains or the Equipment (prior to Acceptance of the relevant Train or item of Equipment, or prior to delivery of the relevant item of Further Equipment with a Certificate of Conformance), to be applied in reinstatement of the insured asset in question;
- (b) in respect of loss of or damage to LUL property, to be retained by the Purchaser; and
- (c) in respect of insurances against liabilities to third parties, to be applied to the aggrieved party or, where that liability has been met by an insured party pursuant to an indemnity or express contractual obligation under this Agreement, shall be paid to the indemnifier or the person liable for such obligations.

8.2 All policies for the Required Insurances shall be endorsed so as to be paid without deduction or set-off, whether in respect of unpaid premiums or otherwise.

9. Law and jurisdiction

All policies maintained or procured pursuant to this schedule 13 shall be subject to English law and the exclusive jurisdiction of the English courts.

10. Payment of Premiums

The Manufacturer shall procure the due and punctual payment of all premiums payable in respect of each policy or contract of insurance taken out in accordance with paragraph 1 (Required Manufacturer Insurances).

11. Manufacturer to supply insurance policies

Promptly following any request from the Purchaser, the Manufacturer shall provide to the Purchaser for inspection a copy of the certificates and policies of insurance maintained in compliance with paragraph 1 (Required Manufacturer Insurances) together with evidence satisfactory to the Purchaser that all premiums payable in respect of such insurances have been paid in full and that such insurances are in full force and effect.

12. Compliance with Requirements

The Parties shall (and the Manufacturer shall procure that its Subcontractors shall) comply with all reasonable requirements of the insurers and shall not do or cause to be done anything which might render void or voidable any policy of insurance effected in accordance with paragraph 1 (Required Manufacturer Insurances) or as a result of which payment of insurance proceeds may be withheld in whole or in part.

13. Purchaser's Right to Insure

13.1 If and to the extent that any of the Required Insurances are not taken out and maintained as contemplated by this schedule 13, the Purchaser may, without prejudice to any other rights under this Agreement, itself arrange the relevant policies or contracts of insurance. The Manufacturer shall indemnify the Purchaser against all premiums and other Losses payable by the Purchaser in exercising its rights under this paragraph 13.1, together with Default Interest from the date on which premiums are paid or other costs incurred until the date of payment by the Manufacturer to the Purchaser.

13.2 If the Purchaser procures an insurance policy or policies pursuant to this paragraph 13, the Purchaser shall be entitled to deduct the amount due from the Manufacturer to the Purchaser under paragraph 13.1 from the next Milestone Payment payable to the Manufacturer, in accordance with Part B: (Milestones) of schedule 10 (Milestones and Security).

14. **Notification of claims**

The Manufacturer shall give to the Purchaser prompt notification of any incident which may reasonably be expected to result in a claim in excess of £150,000 (Indexed), and any incident which may reasonably be expected to result in claims arising from that incident exceeding in aggregate £500,000 (Indexed) in any 12-month period in each case under any of the insurances referred to in paragraph 1 (Required Manufacturer Insurances) accompanied by full details of the said incident.

15. **Loss Mitigation**

The Manufacturer is responsible for ensuring that, in the event of an incident, all reasonable steps are taken to mitigate further loss. This will include any necessary emergency repairs to property damaged in order to mitigate further damage or for reasons of safety. These repairs must be reasonable in relation to the loss or damage that has been suffered.

16. **Unavailability of Insurance**

16.1 Nothing in this Agreement shall oblige the Manufacturer to take out insurance in respect of a risk which is Uninsurable save where the predominant cause of the risk being Uninsurable is any actions, breaches, omissions or defaults of the Manufacturer or a Subcontractor.

16.2 If a risk usually covered by the insurance taken out pursuant to this schedule 13 or by statutory insurance, in each case required under this Agreement, becomes Uninsurable then:

- (a) the Manufacturer shall notify the Purchaser of any risk becoming Uninsurable within five (5) Working Days of becoming aware of the same and in any event at least five (5) Working Days before expiry or cancellation of any existing insurance in respect of that risk;
- (b) if both Parties agree, or it is determined in accordance with the Dispute Resolution Procedure, that the risk is Uninsurable and that:
 - (i) the risk being Uninsurable is not caused by the actions, breaches, omissions or defaults of the Manufacturer or a Subcontractor; and
 - (ii) the Manufacturer has demonstrated to the Purchaser that the Manufacturer and a prudent board of directors of a company operating the same or substantially similar businesses in the United Kingdom to that operated by the Manufacturer would in similar circumstances (in the absence of the type of relief envisaged by this paragraph) be acting reasonably and in the best interests of the company if they resolved to cease to operate such

businesses as a result of that risk becoming Uninsurable, taking into account amongst other things (and without limitation) the likelihood of the Uninsurable risk occurring (if it has not already occurred), the financial consequences for such company if such Uninsurable risk did occur (or has occurred) and other mitigants against such consequences which may be available to such company,

then the Parties shall meet to discuss the means by which the risk should be managed or shared (including considering the issue of self-insurance by either Party).

16.3 For the purposes of this schedule 13 **"Uninsurable"** means, in relation to a risk, either that:

- (a) insurance is not available to the Manufacturer in respect of the Project in the worldwide insurance market with reputable insurers of good standing in respect of that risk; or
- (b) the insurance premium payable for insuring that risk is at such a level that the risk is not general being insured against in the worldwide insurance market with reputable insurer of good standing by contractors in the United Kingdom.

17. **Broker's Letter of Undertaking**

The Manufacturer shall procure that the insurance broker appointed by the Manufacturer to place the Required Insurances delivers to the Purchaser and/or the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1) a letter substantially in the form set out in Part D: (Broker's Letter of Undertaking) of this schedule 13 in respect of each insurance policy or contract effected as part of the Required Insurances required under Parts A and B of this schedule 13, as soon as possible but in any event before the Commencement Date and (where applicable) the subsequent renewal of each such policy.

18. **Saving Provision**

None of:

- (a) the Manufacturer's compliance or failure to comply with its obligations under this schedule 13;
- (b) the existence of the Required Insurances or any other insurance procured by the Manufacturer or the absence (in whole or in part) of them; or
- (c) the terms of any policy or contract of insurance, including the limits of indemnity amounts referred to in Part B: (Insurance required from the Commencement Date in respect of the Works) and Part C: (Insurance Required for the Train Warranty Period) of this schedule 13,

shall relieve or limit the Manufacturer of its liabilities and obligations under this Agreement.

Part B: Insurance required from the Commencement Date in respect of the Works**1. Common to each policy in this Part B:****1.1 Insureds**

- (a) the Manufacturer;
- (b) the Purchaser;
- (c) the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1);
- (d) any Financier;
- (e) Subcontractors of any tier to the Manufacturer;
- (f) Consultants for the site activities only,

each for their respective rights and interests in the Project.

1.2 For the purposes of this Part B:, a Subcontractor may either be: (a) named as an additional insured, or (b) the subject of difference in conditions/difference in limits cover to more specific insurance of the Subcontractor. Where (b) applies the Manufacturer will indemnify any Subcontractor employed by the Manufacturer for the performance of this Agreement:

- (a) in respect of liability which is not the subject of indemnity under any more specific valid and collectible insurance effected by or on behalf of the Subcontractor; and
- (b) in respect of the difference between the limit of indemnity under any more specific valid and collectable insurance offered by or on behalf of the Sub-Contractor and the Limit of Indemnity under this policy.

2. Contractors' "All Risks" Insurance**2.1 Insured Property**

- (a) The Trains and Equipment (including any Part removed from any Train or item of Equipment for maintenance or warranty work), and any other property, including property of the Purchaser, the Manufacturer (including any temporary works for which the Manufacturer is responsible at any Designated Depot), and the directors, employees, officers, servants or agents of any of them, for incorporation in or use in connection with the construction, integration, commissioning, testing and completion of the Trains and Equipment (including testing on the LUL Network in tunnel and in depot) in respect of each Train before operational handover which shall be the relevant date of Acceptance.
- (b) Storage of Trains and Equipment until Provisional Acceptance.

2.2 Coverage

"All risks" of physical loss or damage to the Insured Property unless otherwise excluded.

2.3 Sum Insured

At all times an amount not less than the full reinstatement or replacement value of the Insured Property, plus provision to include extensions as appropriate.

2.4 **Maximum Deductible**

£100,000 (Indexed) each and every claim, increased to £250,000 (Indexed) each and every claim for defective workmanship/design claims.

2.5 **Territorial Limits**

Worldwide including offsite storage and whilst in transit by land, air, rail, sea and inland waterway the interpretation of the policy must be under English law.

2.6 **Period of Insurance**

From the date of this Agreement until Provisional Acceptance of the last Train.

2.7 **Cover Features and Extensions**

- (a) Terrorism
- (b) Munitions of war clause
- (c) Additional costs of completion
- (d) Professional fees clause (including the Purchaser's advisers' fees incurred during any period of reinstatement)
- (e) Debris removal clause
- (f) 72 hour clause
- (g) European Union local authorities clause
- (h) Free issue materials clause
- (i) 15 per cent escalation clause
- (j) Automatic reinstatement of sum insured clause
- (k) Loss minimisation
- (l) Testing/commissioning

2.8 **Principal Exclusions**

- (a) LEG 2
- (b) War and related perils (UK market agreed wording)
- (c) Nuclear/radioactive risks (UK market agreed wording)
- (d) Pressure waves caused by aircraft and other aerial devices travelling at sonic or supersonic speeds
- (e) Wear, tear and gradual deterioration
- (f) Consequential financial losses
- (g) Cyber risks other than physical damage arising from fire, explosion or collision or derailment of rail vehicles resulting from cyber risks
- (h) Inventory losses, fraud and employee dishonesty

3. **Third Party Public and Products Liability Insurance**

3.1 **Interest**

To indemnify the Insureds in respect of all sums that they may become legally liable to pay (including claimant's costs and expenses) as damages in respect of accidental:

- (a) bodily injury, illness, death, disease contracted by any person;
- (b) loss or damage to property; or
- (c) interference to property or any easement right of air, light, water or way or the enjoyment or use thereof by obstruction, trespass, nuisance, loss of amenities, or any like cause,

happening during the Period of Insurance and arising out of or in connection with the Works.

3.2 **Limit of Indemnity**

Not less than £155,000,000 (or such higher amount required by the Office of Rail and Road or its successors for operators of railway assets) in respect of any one occurrence, the number of occurrences being unlimited, but in the aggregate in respect of pollution and products liability.

3.3 **Maximum Deductible**

£25,000 (Indexed) for each and every occurrence of property damage, escalated periodically as appropriate. (Personal injury claims will be paid in full.)

3.4 **Territorial Limits**

Worldwide. The interpretation of the policy must be under English Law.

3.5 **Jurisdiction**

Worldwide.

3.6 **Period of Insurance**

Up to (and including) the later to occur of:

- (a) the expiry of the design life warranty under clause 20.1 in respect of the last Train; and
- (b) the expiry of the Component Life Warranty of all Major Components.

3.7 **Cover Features and Extensions**

- (a) Munitions of war
- (b) Cross liability clause
- (c) Contingent motor liability
- (d) Defence Costs in respect of Health and Safety at Work Legislation
- (e) Corporate Manslaughter defence costs

- (f) Full indemnity for the Purchaser, Owner (when Insureds) and Subcontractor to the extent that the Manufacturer is legally liable
- (g) Automatic reinstatement of sum insured clause on at least one occasion for an annual period

3.8 **Principal Exclusions**

- (a) Liability for death, illness, disease or bodily injury sustained by employees of the Insured.
- (b) Liability arising out of the use of mechanically propelled vehicles whilst required to be compulsorily insured by Legislation in respect of such vehicles.
- (c) Liability in respect of predetermined penalties or liquidated damages imposed under any contract entered into by the Insured.
- (d) Liability in respect of loss or damage to property in the care, custody and control of the Insured but this exclusion is not to apply to all property belonging to Purchaser that is in the care, custody and control of another Insured.
- (e) Liability arising out of technical or professional advice (given for a fee) other than in respect of death or bodily injury to persons or damage to third party property.
- (f) Losses under the insurances referred to in paragraph 2 of this Part B: of schedule 13.
- (g) Liability arising from the ownership, possession or use of any aircraft or marine vessel.
- (h) Liability arising from seepage and pollution unless caused by a sudden, identifiable, unintended and unexpected occurrence.

Part C: Insurance required for the Train Warranty Period

1. Common to all policies in this Part C:

1.1 Insureds

- (a) the Manufacturer;
- (b) the Purchaser;
- (c) the Owner (where it is not the Purchaser and has been notified to the Manufacturer pursuant to clause 44.1);
- (d) any Financier;
- (e) Subcontractors of any tier to the Manufacturer,

each for their respective rights and interests in the Project.

1.2 For the purposes of this Part C:, a Subcontractor may either be: (a) named as an additional insured, or (b) the subject of difference in conditions/difference in limits cover to more specific insurance of the Subcontractor. Where (b) applies the Manufacturer will indemnify any Subcontractor employed by the Manufacturer for the performance of this Agreement:

- (a) in respect of liability which is not the subject of indemnity under any more specific valid and collectible insurance effected by or on behalf of the Subcontractor; and
- (b) in respect of the difference between the limit of indemnity under any more specific valid and collectable insurance offered by or on behalf of the Sub-Contractor and the Limit of Indemnity under this policy.

2. Property Damage Insurance

2.1 Insured Property

- (a) The Trains and Equipment on and following the Provisional Acceptance of such Train and Equipment Acceptance, or (where permitted by this Agreement) delivery with a Certificate of Conformance, of each relevant item of Equipment (including any Part removed from any Train or item of Equipment for maintenance or warranty work), and
- (b) any other property, including property of the Purchaser, the Manufacturer, and the directors, employees, officers, servants or agents of any of them, for incorporation in or use in connection with the carrying out of works to the Trains or Parts thereof (including testing on the LUL Network in tunnel and in depot)

save that in each case only in so far as and whenever such item is not located on the LUL Network or on any other property of the Purchaser because it has been removed therefrom by the Manufacturer or a Subcontractor.

2.2 Coverage

"All risks" of physical loss or damage to the Insured Property from any cause not excluded.

2.3 **Sum Insured**

At all times an amount not less than the total reinstatement or replacement value of the Insured Property plus provision to include other extensions as appropriate.

2.4 **Maximum Deductible**

£100,000 (Indexed) each and every claim, increased to £250,000 (Indexed) each and every claim for defective workmanship/design claims.

2.5 **Territorial Limits**

Worldwide.

2.6 **Period of Insurance**

The Train Warranty Period.

2.7 **Cover Features and Extensions**

- (a) Terrorism.
- (b) Automatic reinstatement of sum insured.
- (c) Capital additions clause.
- (d) 72 hour clause.
- (e) European Union local authorities clause.
- (f) Professional fees.
- (g) Debris removal.
- (h) Pollution and contamination to the Insured Property arising from an event which itself is not otherwise excluded. To include pollution or contamination resulting from accidental damage.
- (i) Repair/reinstatement basis of claims settlement with cash option for non-reinstatement.

2.8 **Principal Exclusions**

- (a) War and related perils (UK market agreed wording).
- (b) Nuclear/radioactive risks (UK market agreed wording).
- (c) Pressure waves caused by aircraft and other aerial devices travelling at sonic or supersonic speeds.
- (d) Wear, tear and gradual deterioration.
- (e) Consequential financial losses.
- (f) Cyber risks other than physical damage arising from fire, explosion or collision or derailment of rail vehicles resulting from cyber risks.

3. **Third Party Public and Products Liability Insurance**

3.1 **Interest**

To indemnify the Insured in respect of all sums that they may become legally liable to pay (including claimant's costs and expenses) as damages in respect of accidental:

- (a) death, or bodily injury, illness, death, disease contracted by any person;
- (b) loss or damage to property; or
- (c) interference to property or any easement right of air, light, water or way or the enjoyment or use thereof by obstruction, trespass, nuisance, loss of amenities, or any like cause,

happening during the Period of Insurance and arising out of or in connection with the Project and the provision of the warranty services during the Train Warranty Period.

3.2 **Limit of Indemnity**

Not less than £155,000,000 (or such higher amount required by the Office of Rail and Road or its successor for operators of Railway assets) in respect of any one occurrence, the number of occurrences being unlimited, but in the aggregate in respect of pollution and products liability.

3.3 **Maximum Deductible**

£25,000 (Indexed) for each and every occurrence of property damage, escalated periodically as appropriate. (Personal injury claims will be paid in full.)

3.4 **Territorial Limits**

UK only.

3.5 **Jurisdiction**

Worldwide.

3.6 **Period of Insurance**

Up to (and including) the later to occur of:

- (a) the expiry of the design life warranty under clause 20.1 in respect of the last Train; and
- (b) the expiry of the Component Life Warranty of all Major Components.

3.7 **Cover Features and Extensions**

- (a) Munitions of war
- (b) Cross liability clause
- (c) Contingent motor liability
- (d) Defence costs in respect of Health and Safety at Work Legislation
- (e) Corporate Manslaughter defence costs
- (f) Full indemnity for the Purchaser, Owner (when Insureds) and Subcontractor to the extent that the Manufacturer is legally liable
- (g) Automatic reinstatement of sum insured on at least one occasion for an annual period

3.8 **Principal Exclusions**

- (a) Liability for death, illness, disease or bodily injury sustained by employees of the Insured.
- (b) Liability arising out of the use of mechanically propelled vehicles whilst required to be compulsorily insured by Legislation in respect of such vehicles.
- (c) Liability in respect of predetermined penalties or liquidated damages imposed under any contract entered into by the Insured.
- (d) Liability in respect of loss or damage to property in the care, custody and control of the Insured but this exclusion is not to apply to all property belonging to the Purchaser including Trains and Equipment after Provisional Acceptance that is in the care, custody and control of another Insured.
- (e) Liability arising out of technical or professional advice (given for a fee) other than in respect of death or bodily injury to persons or damage to third party property.
- (f) Losses under the Insurances referred to in paragraph 2 of this Part C.
- (g) Liability arising from the ownership, possession or use of any aircraft or marine vessel.
- (h) Liability arising from seepage and pollution unless caused by a sudden, identifiable, unintended and unexpected occurrence.

4. **PI Insurance**

- 4.1 The Manufacturer undertakes itself to, and to procure that Subcontractor(s) take out and maintain in force professional indemnity insurance with worldwide jurisdiction ("**PI Insurance**").
- 4.2 Without prejudice to the other provisions of this Agreement, the Manufacturer shall provide evidence satisfactory to (as and when reasonably required by) the Purchaser of the PI Insurance being in full force and effect from the date of this Agreement until the date 12 years from and including the completion of all the services to be provided by the Manufacturer during the Train Warranty Period as appropriate such evidence to include details of the cover including confirmation of territorial limits, confirmation that coverage includes breach of intellectual property rights, levels of excess, insurers, policy number and indemnity limit which shall be a minimum of ten million pounds (£10,000,000) (Indexed) per event and with an excess not greater than five hundred thousand pounds (£500,000) (Indexed) for each and every loss and otherwise to be on terms satisfactory to the Purchaser.
- 4.3 The Manufacturer shall provide the Purchaser with notice of:
 - (a) any cancellation of the PI Insurance not less than 30 days prior to the relevant cancellation date; and
 - (b) any adverse material changes (including, for the avoidance of doubt, any changes to the excess levels) to or suspension of cover relevant to the Project not less than 30 days prior to the relevant change or suspension.
- 4.4 The Manufacturer shall inform the Purchaser as soon as reasonably practicable of any third party claim under the PI Insurance in respect of the Project in excess of five hundred thousand pounds (£500,000) (Indexed) and provide such information to the Purchaser as the Purchaser may reasonably require in relation to such claim and provide notice of any potential breach of the aggregate limit.

Part D: Broker's Letter of Undertaking

To: London Underground Limited

Dear Sir/Madam

Manufacturer and Supply Agreement dated [] entered into between Siemens Mobility Limited (the "Manufacturer") and London Underground Limited (the "Purchaser") (the "Agreement")

We refer to the Agreement. Unless the context otherwise requires, terms defined in the Agreement shall have the same meaning in this letter.

1. We act as insurance broker to the Manufacturer in respect of the Required Insurances and in that capacity we confirm that the Required Insurances which are required to be procured pursuant to clause 19 and schedule 13 of the Agreement:
 - (a) where appropriate name you and such other persons as are required to be named pursuant to the Agreement for their respective interests;
 - (b) are, in our reasonable opinion as insurance brokers, as at today's date, in full force and effect;
 - (c) all premiums due to date in respect of the Required Insurances are paid and the Required Insurances are, to the best of our knowledge and belief, placed with and maintained with insurers with a Standard & Poor's Corporation long-term credit rating of at least A- (or an equivalent rating from another rating agency of equal repute). We do not however make any representations regarding such insurers' current or future solvency, or ability to pay claims; and that
 - (d) the endorsements set out in Part E: (Endorsements) of schedule 13 of the Agreement which is attached hereto are in our reasonable opinion as at today's date in full force and effect in respect of the Required Insurances.
2. We further confirm that the attached cover notes confirm this position.
3. Pursuant to instructions received from the Manufacturer and in consideration of your approving our appointment or continuing appointment as brokers in connection with the Required Insurances, we hereby undertake in relation to the Required Insurances:
 - (a) **Notification Obligations**
 - (i) notify you at least 30 days prior to the expiry of any of the Required Insurances if we have not received instructions from the Manufacturer to negotiate renewal and in the event of our receiving instructions to renew, to advise you promptly of the details thereof;
 - (ii) to notify you at least 30 days prior to ceasing to act as brokers in relation to the Required Insurances unless, due to circumstances beyond our control, we are unable to do so in which case we shall notify you as soon as practicable;
 - (iii) to notify you as soon as reasonably practicable if the long-term credit rating of any insurer of the Required Insurances falls below the level referred to in clause 1(c) of this letter; and

- (iv) to pay without set off or deduction of any kind for any reason all payments in respect of claims received by us from insurers in relation to the Required Insurances specified in Part A: (Manufacturer Obligations) of schedule 13 of the Agreement in accordance with the loss payable clause endorsed on the policy as set out in Part E: (Endorsements) of schedule 13 of the Agreement.

(b) **Advisory Obligations**

- (i) to notify you as soon as reasonably practicable of any default in the payment of any premium for any of the Required Insurances;
- (ii) to notify you if any insurer cancels or gives notification of cancellation of any of the Required Insurances to us, at least 30 days before such cancellation is to take effect or as soon as reasonably practicable in the event that notification of cancellation takes place less than 30 days before it is to take effect;
- (iii) to notify you as soon as reasonably practicable of any act or omission, breach or default of which we have been notified which in our reasonable opinion would either, invalidate or render unenforceable in whole or in part any of the Required Insurances or, would otherwise materially impact on the extent of cover provided under the Required Insurances; and
- (iv) in accordance with our duty to the Manufacturer to notify the Manufacturer of its pre-contractual duties of disclosure to insurers, including the duty to disclose all information that would be considered material in the context of such duty.

(c) **Disclosure Obligations**

- (i) subject to the prior written consent of the Manufacturer (and we undertake to notify you as soon as reasonably practicable if such consent is withheld) to disclose to insurers all information provided to those of our employees directly involved with the placement of the Required Insurances in our capacity as insurance broker to the Manufacturer, including any fact, change of circumstance or occurrence notified to such employees, which in our reasonable opinion is material to the risks insured against under the Required Insurances and which properly should be disclosed to insurers, or in accordance with the policy terms and conditions of the relevant Required Insurance, as soon as reasonably practicable after we are in receipt of such information, fact, change of circumstance or occurrence whether prior to inception or renewal or otherwise.
- (ii) to treat as confidential all information so marked or otherwise stated to be confidential and supplied to us by or on behalf of the Manufacturer or the Purchaser and not to disclose such information, without the prior written consent of the supplier, to any third party other than those persons who, in our reasonable opinion have a need to have access to such information from time to time, and for the purpose of disclosure to the insurers or their agents in respect of the Required Insurances. Our obligations of confidentiality shall not conflict with our duties owed to the Manufacturer and shall not apply to disclosure required by an order of a court of competent jurisdiction, or pursuant to any applicable law, governmental or regulatory authority having the force of law or to information which is in the public domain.

(d) Administrative Obligations

- (i) to hold copies of all documents relating to or evidencing the Required Insurances, including but without prejudice to the generality of the foregoing, insurance slips, contracts, policies, endorsements and copies of all documents evidencing renewal of the Required Insurances, payment of premiums and presentation and receipt of claims;
- (ii) to supply to the Purchaser and/or its insurance advisers (or the Purchaser's or its insurance advisers' authorised representatives) promptly on written request copies of the documents set out in clause 3(d)(i) of this letter, and to the extent available, to make available to such persons promptly upon the Purchaser's request the originals of such documents;
- (iii) to administer the payment of premiums due pursuant to the Required Insurances such that, in so far as we hold appropriate funds, all such premiums shall be paid to insurers in accordance with the terms of the Required Insurances;
- (iv) to administer the payment of claims from insurers in respect of the Required Insurances (the "**Insurance Claims**") including:
 - (A) negotiating settlement of Insurance Claims presented in respect of the Required Insurances;
 - (B) collating and presenting all information required by insurers in relation to Insurance Claims presented in respect of the Required Insurances; and
- (v) in so far as it is relevant and practicable, liaising and reporting to the Purchaser throughout the settlement, payment and administration of such Insurance Claims;
- (vi) to advise the Purchaser as soon as reasonably practicable upon receipt of notice of any material changes which we are instructed by the Manufacturer to make in the terms of the Required Insurances and which, if effected, in our reasonable opinion as Insurance Brokers would result in any material reduction in limits or coverage or increase in deductibles, exclusions or exceptions; and
- (vii) to use our reasonable endeavours to have endorsed on each and every policy evidencing the Required Insurances (when the same is issued) endorsements substantially in the form set out in Part E: of schedule 13 of the Agreement.

4. Notification Details

Our obligations at clause 3 of this letter to notify or inform you shall be discharged by providing the requisite information in hard copy to:

55 Broadway, London, United Kingdom, SW1H 0BD.

5. Save insofar as we have given agreements or representations in this letter, it is to be understood by the Purchaser that they may not rely on any advice which we have given to the Manufacturer, and we do not represent that the Required Insurances are suitable or sufficient to meet the needs of the Purchaser which must take steps and advice of its own as it considers necessary in order to protect its own position.

6. The representations and obligations set out in this letter are subject to our continuing appointment as insurance brokers to the Manufacturer in relation to the Required Insurances concerned, and following termination of such appointment our immediate release from all our obligations set out in this letter to the extent those obligations arise on or after the termination, and subject to any right of lien we may have over the policy and policy documents regarding the Required Insurances, arising through common law or otherwise.
7. Our aggregate liability to any persons, companies or organisation who acts in reliance on this letter, or any other broker's letter of undertaking issued by us in respect of the insurances for the Project, for any and all matters arising from it and the contents hereof shall in any and all events be limited to the sum of £5,000,000, even if we are negligent. We do not limit liability for our fraud.
8. This letter is given by us on the instructions of the Manufacturer and with their full knowledge and consent as to its terms.

Yours faithfully

For and on behalf of [*Manufacturer's broker*]

We consent to the giving of this Letter of Undertaking by our insurance brokers

For and on behalf of
Siemens Mobility Limited

Part E: Endorsements

Endorsement 1

Cancellation

This policy shall not be cancelled or terminated before the original expiry date is to take effect except in respect of non-payment of premium.

The insurer shall by written notice advise the Purchaser:

- (a) at least 30 days before any such cancellation or termination is to take effect;
- (b) at least 30 days before any reduction in limits or coverage or any increase in deductibles is to take effect;
- (c) of any act or omission or any event of which the insurer has knowledge and which might invalidate or render unenforceable in whole or in part this policy;
- (d) of any default in payment or any premium payable under the policy; and
- (e) of any act or omission, including but not limited to known breaches of warranty, or of any event of which the insurer has knowledge and which might invalidate or render a policy void or voidable at the insurer's discretion.

Endorsement 2

Multiple Insured / Subrogation / Non-Vitiating clause (not applicable to the PI Insurance)

Each of the Parties comprising the insured shall for the purpose of this policy be considered a separate co-insured entity, insured on a composite basis, with the words "the insured" applying to each as if they were separately and individually insured provided that the total liability of the insurers under each section of this policy to the insured collectively shall not (unless the policy specifically permits otherwise) exceed the limit of indemnity or amount stated to be insured under that section or policy. Accordingly, the liability of the insurers under this policy to any one insured shall not be conditional upon the due observance and fulfilment by any other insured party of the terms and conditions of this policy or of any duties imposed upon that insured party relating thereto, and shall not be affected by any failure in such observance or fulfilment by any such other insured party.

It is understood and agreed that any payment or payments by insurers to any one or more of the insureds shall reduce, to the extent of that payment, insurers' liability to all such parties arising from any one event giving rise to a claim under this policy and (if applicable) in the aggregate.

Insurers shall be entitled to avoid liability to or (as may be appropriate) claim damages from any insured party in circumstances of fraud misrepresentation non-disclosure or material breach of warranty or condition of this policy (each referred to in this clause as a "**Vitiating Act**") committed by that insured party save where such misrepresentation non-disclosure or breach of warranty or condition was committed innocently and in good faith.

For the avoidance of doubt it is however agreed that a Vitiating Act committed by one insured party shall not prejudice the right to indemnity of any other insured who has an insurable interest and who has not committed the Vitiating Act.

Insurers hereby agree to waive all rights of subrogation and/or recourse which they may have or acquire against any insured party (together with their employees and agents) except where the rights of subrogation or recourse are acquired in consequence of a Vitiating Act in which circumstances insurers may enforce such rights against the insured responsible for the Vitiating Act notwithstanding the continuing or former status of the vitiating party as an insured.

Notwithstanding any other provision of this policy or any other document or any act and/or omission by any insured party insurers agree that:

- (a) no party other than the Purchaser has any authority to make any warranty, disclosure or representation in connection with this policy on behalf of Purchaser;
- (b) where any warranty, disclosure or representation is required from the Purchaser in connection with this policy insurers will contact the Purchaser in writing (in accordance with Endorsement 3 to the Agreement) and set out expressly the warranty, disclosure and/or representation required within a reasonable period of time from the Purchaser (regarding itself); and
- (c) save as set out in a request from insurers to the Purchaser in accordance with (b) above, the Purchaser shall have no duty to disclose any fact or matter to insurers in connection with this policy save to the extent that for the Purchaser not to disclose a fact or matter would constitute fraudulent misrepresentation and/or fraudulent non-disclosure.

Endorsement 3

Communications

All notices or other communications under or in connection with this policy shall be given to each insured (and the Purchaser) in writing or by facsimile. Any such notice will be deemed to be given as follows:

- (a) if in writing, when delivered
- (b) if by facsimile, when transmitted but only if, immediately after transmission, the sender's facsimile machine records a successful transmission has occurred.

The address and facsimile number of the Purchaser for all notices under or in connection with this policy are those notified from time to time by the Purchaser for this purpose to the Contractor's insurance broker at the relevant time. The initial address and facsimile number of the Purchaser is as follows:

London Underground Limited:

Address: 55 Broadway, London, United Kingdom, SW1H 0BD

Facsimile No: +44 (0) 20 7126 4598

Attention: Company Secretary

It is further agreed that a notice of claim given by the Purchaser or any other insured shall in the absence of any manifest error be accepted by the insurer as a valid notification of a claim on behalf of all insureds.

Endorsement 4

Loss Payee (applicable only to the Contractors' "All Risks" Policies)

All Required Insurances shall provide that claim proceeds, whether interim or final unless and until the insurers receive written notice from the Manufacturer and the Purchaser directing otherwise, shall be paid to the Purchaser, or, at the Purchaser's discretion, to other parties and where such other party is the Manufacturer, the proceeds being released to the Manufacturer against its undertaking to reinstate such loss or damage with such supporting information as the Purchaser may reasonably require:

- (a) in respect of loss or damage to the Trains or the Equipment (prior to Acceptance of the relevant Train or item of Equipment, or prior to delivery of the relevant item of Further Equipment with a Certificate of Conformance), to be applied in reinstatement of the insured asset in question;
- (b) in respect of loss of or damage to LUL Property, to be retained by the Purchaser; and
- (c) in respect of insurances against liabilities to third parties, to be applied to the aggrieved party or, where that liability has been met by an insured party pursuant to an indemnity or express contractual obligation under this Agreement, shall be paid to the indemnifier or the person liable for such obligations.

and shall be payable without deduction or set-off from the agreed claim.

Endorsement 5

Primary Insurance

It is expressly understood and agreed that this policy provides primary cover for the insured parties and that in the event of loss destruction damage or liability covered by this policy which is covered either in whole or in part under any other policy or policies of insurance effected by or on behalf of any of the insured parties the insurers will indemnify the insured parties as if such other policy or policies of insurance were not in force and the insurers waive their rights of recourse if any against the insurers of such other policy or policies of insurance.

Endorsement 6

Claims Negotiation Rights

Notwithstanding any claim conditions contained herein insurers agree that the Purchaser has the right to settle and negotiate any claims received from third parties subject to prior consent of insurers. If the Purchaser takes or fails to take any action as a direct result of which insurers' liability is increased then the liability of insurers to provide an indemnity is reduced to such an extent.

Endorsement 7

Ringfencing

The level of any indemnity available to an insured party under this policy in relation to any claim(s) concerning the Works shall not be affected and/or reduced by any claim(s) unrelated to the Works.

SCHEDULE 14

Responsible Procurement

1. INTRODUCTION

1.1 General

- (a) The Manufacturer is required to implement Responsible Procurement through this Agreement and its requirements for this are set out in this schedule 14.
- (b) The Manufacturer shall comply and shall ensure that its Subcontractors comply with this schedule 14.

1.2 Definitions

"Apprentice" means an individual employed for a minimum of 16 hours a week who is undertaking a sector skills council/standard setting body recognised structures programme of training leading to the completion of a full apprenticeship;

"Black, Asian and Minority Ethnic" or **"BAME"** means a business in which 51 per cent or more of the share capital is owned by members of one or more Minority Ethnic Groups;

"Child" means any person less than 15 years of age unless local minimum age law stipulates a higher age for work or mandatory schooling, in which case the higher age shall apply. If however, local minimum age law is set at 14 years of age in accordance with developing country exceptions under ILO Convention No. 138, the lower age will apply;

"Child Labour" means a Child or Young Person, which does not comply with the provisions of the relevant ILO standards, and any work that is likely to be hazardous or to interfere with the Child's or Young Person's education, or to be harmful to the Child's or Young Person's health or physical, mental, spiritual, moral or social development;

"Ethical Sourcing Practices" has the meaning given to such term in paragraph 2.7(a) of this schedule 14;

"Graduate" means an individual employed for 16 hours or more a week who has completed their undergraduate degree within the last 12 months and who is beginning an employment position on a formal graduate trainee scheme with a minimum duration of six (6) months;

"ILO" means the International Labour Organisation;

"Job Start" means an individual employed for 16 hours a week or more beginning a position of employment with a minimum duration of six (6) months;

"London Borough" means a borough within the administrative area of Greater London (plus the City of London), which comprises 33 boroughs;

"London Living Wage" means the basic hourly wage of £9.15 (before tax, other deductions and any increase for overtime) determined by the Greater London Authority for employees working full time on the Works within one of the London Boroughs, as may be updated from time to time;

"Minority Ethnic Groups" means those who have classified themselves as members of ethnic groups other than 'white British';

"Placement Position" means a position intended to enable an individual to learn, develop or enhance their knowledge and skills in relation to the employment market that lasts between 11 days and 100 days and which includes elements of job coaching and support;

"Relevant Employment Vacancy" means an employment vacancy within the Manufacturer's organisation for a member of the Manufacturer's personnel and, where relevant, Subcontractors;

"Responsible Procurement" means compliance with the GLA Responsible Procurement Policy dated March 2006 (as amended in January 2008 and as may be further amended from time to time);

"Responsible Procurement Plan" means the plan developed by the Manufacturer which describes the management processes and procedures for achieving compliance with the requirements set out in this schedule 14;

"Responsible Procurement Progress Report" has the meaning given to such term in paragraph 2.3(a) of this schedule 14;

"Responsible Procurement Representative" means the person appointed by the Manufacturer pursuant to paragraph 2.1(a) of this schedule 14;

"Responsible Procurement Schedule" has the meaning given to such term in Appendix 3 to this schedule 14;

"Skills and Employment Strategy" means the TfL Group's 10 year skills and employment strategy dated December 2011 as amended from time to time;

"SI Academy" means the Purchaser's Systems Integration Academy;

"SLNT" has the meaning given to such term in paragraph 2.5(b)(i) of this schedule 14;

"Small and Medium Enterprise" or "SME" means a business which meets at least two of the following criteria:

- (a) turnover per annum of up to £22.8 million;
- (b) balance sheet net asset value of no more than £11.4 million;
- (c) 250 employees or fewer,

and the criteria in (b) and (c) will also be applied to group accounts where the turnover for the group does not exceed the figure stated in (a);

"STEM Ambassador Programme" means the Purchaser's and TfL's STEM Ambassador Programme;

"STEM" means Science, Technology, Engineering and Mathematics;

"Strategic Labour Needs and Training Plan" or "SLNT Plan" means the plan in Appendix 4 consistent with the requirements of paragraph 2.5 of this schedule 14;

"Suppliers demonstrating a diverse workforce" means a workforce where 51 per cent or more is representative of Minority Ethnic Groups, Suppliers from under-represented groups or Suppliers from protected groups;

"Suppliers from protected groups" means groups in which 51 per cent or more of the share capital is owned by members of a group for which protection is provided by anti-discriminatory legislation;

"Suppliers from under-represented groups" means groups in which 51 per cent or more of the share capital is owned by members of one or more of the following groups:

- (a) gender – women;
- (b) disability – people with physical and sensory impairments, learning difficulties and mental health requirements;
- (c) sexual orientation – lesbians, gay men, bisexual and transgender people;
- (d) age – older people (aged 60 or over), young adults (aged 24 or under);

"Trainee" means an individual on a placement position;

"Work Force Skills" means workforce training or development activity for full time employed individuals that forms part of an accredited course of learning and development; and

"Young Person" means any worker over the age of a Child and under the age of 18.

2. **MANAGEMENT REQUIREMENTS**

2.1 **Responsible Procurement Representative**

- (a) The Manufacturer shall appoint a representative (the **"Responsible Procurement Representative"**) who shall:
 - (i) be the primary contact for all Responsible Procurement related matters under this Agreement;
 - (ii) be responsible for production, implementation, management and updating of the Responsible Procurement Plan and any further deliverables required by the plan;
 - (iii) have responsibility for ensuring that the Manufacturer's Responsible Procurement obligations are met in accordance with this Agreement; and
 - (iv) co-operate with the Purchaser in providing evidence and records in support of Responsible Procurement including evidence and records from Subcontractors employed in relation to the Works.

2.2 **Responsible Procurement Plan**

- (a) Within four (4) weeks of the Commencement Date, the Manufacturer shall produce a Responsible Procurement Plan and submit it to the Purchaser for Approval. All subsequent revisions of such plan shall be submitted to the Purchaser for Approval in accordance with paragraph 2.2(d) below.
- (b) The Responsible Procurement Plan shall:
 - (i) describe the management processes and procedures for achieving compliance with all the Responsible Procurement requirements detailed within this schedule 14 and include the Strategic Labour Needs and Training Plan;

- (ii) demonstrate how the processes and procedures for achieving compliance with the Responsible Procurement requirements will be imposed on Subcontractors to ensure compliance throughout the supply chain; and
- (iii) include a programme of activities to support the Responsible Procurement Plan with proposed dates for commencement and completion, including but not limited to:
 - (A) proposed training programme and dates;
 - (B) progress report submittal dates;
 - (C) progress meeting scheduled dates; and
 - (D) dates for site inspections and internal audits required to evidence progress achieved.
- (c) The Manufacturer shall manage the Works in compliance with the Approved Responsible Procurement Plan.
- (d) The Manufacturer shall review and update the Responsible Procurement Plan as necessary and in a timely way as the Works progress to ensure it reflects the current status of the Works. Revised versions of the Responsible Procurement Plan shall be submitted to the Purchaser for Approval.
- (e) The Manufacturer shall inform all employees and Subcontractors, with direct or indirect responsibilities under the Responsible Procurement Plan, of the contents of the plan that apply to their services.

2.3 Monitoring, Reporting and Management

Responsible Procurement Progress Report

- (a) The Manufacturer shall submit a quarterly Responsible Procurement progress report ("**Responsible Procurement Progress Report**") to the Purchaser.
- (b) The Responsible Procurement Progress Report shall include the following:
 - (i) a performance review and action plan (in the format detailed in Appendix 1 to this schedule 14 (*Responsible Procurement Performance Review and Action Plan Template*));
 - (ii) areas of concern / areas where guidance from the Purchaser is required;
 - (iii) the strategic labour needs and training monitoring report (in the format detailed in Appendix 2 to this schedule 14 (*Strategic Labour Needs and Training Monitoring Report Template*));
 - (iv) an updated Responsible Procurement Schedule including the Manufacturer's use of "CompeteFor";
 - (v) updated Responsible Procurement Schedules submitted by Subcontractors to the Manufacturer in accordance with Appendix 3 to this schedule 14 (Responsible Procurement Schedule Requirements); and
 - (vi) reporting against the Responsible Procurement requirements detailed below.

(c) **Supplier Diversity Reporting**

(i) The Manufacturer shall report the following:

(A) The number of the Manufacturer's Subcontractors that are:

	Subcontractors (No.)
SME	
BAME	
Suppliers from other under-represented or protected groups	
Suppliers demonstrating a diverse workforce composition	

(B) The level of spend, to date, with the Manufacturer's Subcontractors that are:

	Subcontractors	
	Level of spend (£)	Proportion of total subcontract spend (%)
SME		
BAME		
Suppliers from other under-represented or protected groups		
Suppliers demonstrating a diverse workforce composition		

(d) **Equality and Diversity Reporting**

The Manufacturer shall report the number of the Manufacturer's employees and, to the extent reasonably possible, of the employees of its Subcontractors engaged in the performance of this Agreement who are:

	Manufacturer	Subcontractors
Female		
People from Minority Ethnic Group communities		
Aged under 25		
Disabled		
Total Workforce		

(e) **Strategic Labour Needs and Training Reporting**

The Manufacturer shall provide to the Purchaser reports in relation to strategic labour needs and training in the form of each of the templates in Appendix 1 to this schedule 14 (*Responsible Procurement Performance Review and Action Plan Template*) and Appendix 2 to this schedule 14 (*Strategic Labour Needs and Training Monitoring Report Template*).

(f) **Ethical Sourcing Practices Reporting**

The Manufacturer shall report on ethical sourcing practices in accordance with the Responsible Procurement Performance Review and Action Plan template in Appendix 1 (*Responsible Procurement Performance Review and Action Plan Template*). Unless specific risks are identified following the risk analysis which then

require further management and monitoring which shall be agreed by the Manufacturer and the Purchaser if required.

(g) **Responsible Procurement Progress Meeting**

The Manufacturer, its Subcontractors (where deemed required by the Purchaser) engaged on the Works and the Purchaser shall meet one week following receipt of the Responsible Procurement Progress Report to review Responsible Procurement activity under this Agreement. The objective of the meeting shall be to verify that work is proceeding in accordance with the Responsible Procurement Plan.

(h) **External Audits**

(i) Without prejudice to clause 9 (Manufacturing Facilities and Rights of Audit):

- (A) the Purchaser (or its nominated representative) shall undertake audits of the Manufacturer and Subcontractors working on the Works with regard to Responsible Procurement;
- (B) The Manufacturer shall be given notice of the proposed external audit date and shall cooperate in relation to any audit, including providing or procuring full access to premises used in the Manufacturer's or Subcontractor's performance of the Works;
- (C) The Manufacturer and its Subcontractors shall assist with these audits and make personnel and records available as required; and
- (D) The Manufacturer and its Subcontractors shall maintain and retain records relating to the Responsible Procurement provisions of this part of this Agreement for a minimum of seven (7) years.

2.4 **Responsible Procurement Requirements**

(a) **Encouraging a Diverse Base of Suppliers**

For the purposes of this schedule 14, the term "**Diverse Suppliers**" shall comprise the following four sub-sets:

- (i) Small and Medium Enterprises;
 - (ii) Black, Asian and Minority Ethnic businesses;
 - (iii) Suppliers from other under-represented or protected groups; and
 - (iv) Suppliers demonstrating a diverse workforce composition.
- (b) The Manufacturer shall demonstrate actual and planned compliance with these targets through its supplier diversity reporting and by providing and maintaining a detailed Responsible Procurement Schedule which meets the requirements set out in Appendix 3 to this schedule 14 (Responsible Procurement Schedule Requirements).
- (c) To the extent that the Manufacturer intends to use Subcontractors in jurisdictions other than the United Kingdom, the Manufacturer must:
- (i) interpret this schedule 14 using equivalent definitions applicable in those jurisdictions or, where there are no equivalent definitions, provide an explanation and propose an alternative approach that reasonably approximates with the approach described in this schedule 14; and

- (ii) comply with the equality and diversity requirements to the greatest extent permitted by the laws of their applicable jurisdiction and, where the legislation of that jurisdiction does not permit a reasonable approximation of the approach described in this schedule 14, provide an explanation and propose an alternative approach that reasonably approximates with the approach described in this schedule 14.
- (d) The monitoring of ethnic classification groups used for monitoring purposes are:
 - (i) White British;
 - (ii) Irish;
 - (iii) any other White background;
 - (iv) Mixed White & Black Caribbean;
 - (v) White & Black African;
 - (vi) White & Asian;
 - (vii) any other Mixed background;
 - (viii) Asian or Asian British Indian;
 - (ix) Pakistani;
 - (x) Bangladeshi;
 - (xi) any other Asian background;
 - (xii) Black or Black British Caribbean;
 - (xiii) African;
 - (xiv) any other Black background;
 - (xv) Chinese or other Ethnic Group Chinese; and
 - (xvi) any other Ethnic Group.
- (e) **Meet the Buyer Event**

The Manufacturer shall participate in "Meet the Buyer Events" as and when organised by either TfL, the Purchaser, the Purchaser's Affiliates and/or any of their subsidiaries or nominees.

2.5 Meeting Strategic Labour Needs and Enabling Training Opportunities

(a) Strategic Labour Needs and Training Plan

The Manufacturer shall develop and implement a Strategic Labour Needs and Training Plan (the "**SLNT Plan**") for this Agreement. The SLNT Plan shall form part of the Responsible Procurement Plan. The SLNT Plan shall state the Manufacturer's strategic labour needs and training objectives and the means by which the objectives shall be achieved. The Manufacturer shall update the SLNT Plan as necessary, and at least on an annual basis, and shall submit all revisions of such plan to the Purchaser for Approval.

(b) The SLNT Plan shall include:

- (i) the Manufacturer's proposals to deliver the strategic labour needs and training ("**SLNT**") for the performance of the Works in accordance with this Agreement including delivery against the following priority areas:
 - (A) the qualifications and training programmes identified;
 - (B) named staff resource to be deployed to support the activity;
 - (C) external funding streams identified to support the activity;
 - (D) assumptions made in proposing the activities; and
 - (E) any input required from the Purchaser to undertake these activities;
- (ii) the Manufacturer's processes for ensuring the SLNT requirements will be met through the Manufacturer's Subcontractors, where they are responsible for delivering part of the Works, including:
 - (A) how SLNT considerations will be included in the selection, contracting and management of Subcontractors;
 - (B) how the Manufacturer plans to make Subcontractors aware of any services and government support and funding streams for any SLNT activity to be undertaken towards the Manufacturer's proposed SLNT outputs; and
 - (C) how the Manufacturer will facilitate engagement between the Purchaser and the Manufacturer's supply chain to ensure that available funding streams and training programmes can be maximised;
- (iii) the Manufacturer's outline of its processes for monitoring and co-ordinating the delivery of the SLNT outputs, which shall include:
 - (A) details of the personnel responsible for implementing, managing and reporting SLNT activity within the Manufacturer's organisation; and
 - (B) the administrative and management arrangements that will be operated in relation to the Manufacturer's SLNT activity;
- (iv) the Manufacturer's outline of its arrangements to put the SLNT Plan into action following Approval, which shall include the following:
 - (A) engagement with the Purchaser to develop the SLNT Plan within the Responsible Procurement Plan;
 - (B) the required administration, management and reporting structures; and
 - (C) how the Manufacturer will attract, develop and retain personnel with the skills (including numeracy and literacy) necessary to deliver the Works;
- (v) The Manufacturer's approach to supporting initiatives to promote STEM education and careers including:
 - (A) establishing relationships with schools and the London Transport Museum and supporting the STEM Ambassador Programme to facilitate the promotion of careers in the engineering sector;

- (B) providing 100 volunteer hours per annum during the term of this Agreement to the STEM Ambassador Programme; and
- (C) directly supporting the delivery of educational events, materials in primary schools, nurseries and other educational settings; and
- (vi) the Manufacturer's approach to supporting the SI Academy including:
 - (A) enhancing systems integration training material and provisions with Train related material to facilitate knowledge transfer of systems integration tools and techniques;
 - (B) supporting the development of specific course content, enhancing existing courses, provision of examples, facilitation of and enabling the gathering of real world experience;
 - (C) undertaking learning development through the SI Academy to achieve systems integration competencies to reduce systems integration risks and improve knowledge transfer between the Purchaser and its suppliers, provided that all training costs shall be borne by the Manufacturer; and
 - (D) providing Train specific equipment that supports the attainment of systems integration knowledge.

2.6 Strategic Labour Needs and Training Output Breakdown

The Manufacturer shall deliver the SLNT requirements for this Agreement in accordance with this schedule 14. The Manufacturer shall deliver the following minimum requirements for SLNT:

- (a) where an apprenticeship training is for longer than one year, the Purchaser will allow each subsequent training year to count against the Manufacturer's overall SLNT requirement i.e. if the Manufacturer has an SLNT target of 12, this could either equate to 12 Apprentices each undertaking a year Apprenticeship or alternatively four Apprentices undertaking a three-year Apprenticeship;
- (b) during delivery of the Works, the Manufacturer shall employ at least three (3) Graduates and five (5) Apprentices per annum in connection with the design or management of the Works. For the avoidance of doubt, this requirement shall be calculated as follows:
 - (i) 3 graduates per annum x (the number of years from the Commencement Date to the end of the Train Warranty Period for the last Fleet to be procured pursuant to a Whole Line Option);
 - (ii) 5 Apprentices per annum x (the number of years from the Commencement Date to the end of the Train Warranty Period for the last Fleet to be procured pursuant to a Whole Line Option).

The profile for delivery of this requirement in is set out in the Strategic Labour Needs and Training Plan in Appendix 4 (*SLNT Plan*).

2.7 Ethical Sourcing Practices

- (a) The Manufacturer shall ensure that in carrying out its obligations under this Agreement, it complies with the following minimum requirements (derived from the Ethical Trading Initiative (ETI) Base Code) (the "**Ethical Sourcing Practices**")

and shall use reasonable endeavours to ensure that Subcontractors comply with these minimum requirements:

- (i) employment is freely chosen:
 - (A) there is no forced, bonded or involuntary prison labour;
 - (B) workers are not required to lodge deposits or their identity papers with their employer and are free to leave their employer after reasonable notice;
- (ii) freedom of association and the right to collective bargaining are respected:
 - (A) workers, without distinction, have the right to join or form trade unions of their own choosing and to bargain collectively;
 - (B) the employer adopts an open attitude towards the activities of trade unions and their organisational activities;
 - (C) workers' representatives are not discriminated against and have access to carry out their representative functions in the workplace; and
 - (D) where the right to freedom of association and collective bargaining is restricted under law, the employer facilitates, and does not hinder, the development of parallel means for independent and free association and bargaining;
- (iii) working conditions are safe and hygienic:
 - (A) a safe and hygienic working environment shall be provided, bearing in mind the prevailing knowledge of the industry and of any specific hazards. Adequate steps shall be taken to prevent accidents and injury to health arising out of, associated with, or occurring in the course of work, by minimising, so far as is reasonably practicable, the causes of hazards inherent in the working environment;
 - (B) workers shall receive regular and recorded health, safety and environment training, and such training shall be repeated for new or reassigned workers;
 - (C) access to clean toilet facilities and to potable water, and, if appropriate, sanitary facilities for food storage shall be provided;
 - (D) accommodation, where provided, shall be clean, safe, and meet the basic needs of the workers; and
 - (E) the company observing the code shall assign responsibility for health, safety and environment to a senior management representative;
- (iv) Child Labour shall not be used:
 - (A) there shall be no recruitment of Child Labour;
 - (B) companies shall develop or participate in and contribute to policies and programmes which provide for the transition of any Child found to be performing Child Labour to enable him to attend and remain in quality education until no longer a Child;

- (C) Children and Young Persons shall not be employed at night or in hazardous conditions; and
 - (D) these policies and programmes shall conform to the provisions of the relevant ILO standards;
- (v) living wages are paid:
- (A) wages and benefits paid for a standard working week meet, at a minimum, national legal standards or industry benchmark standards, whichever is higher. In any event wages should always be enough to meet basic needs and to provide some discretionary income;
 - (B) all workers shall be provided with written and understandable information about their employment conditions in respect to wages before they enter employment and about the particulars of their wages for the pay period concerned each time that they are paid; and
 - (C) deductions from wages as a disciplinary measure shall not be permitted nor shall any deductions from wages not provided for by national law be permitted without the expressed permission of the worker concerned. All disciplinary measures should be recorded;
- (vi) working hours are not excessive:
- (A) working hours comply with national laws and benchmark industry standards, whichever affords greater protection;
- (vii) no discrimination is practised:
- (A) there is no discrimination in hiring, compensation, access to training, promotion, termination or retirement based on race, caste, national origin, religion, age, disability, gender, marital status, sexual orientation, union membership or political affiliation;
- (viii) regular employment is provided:
- (A) to every extent possible work performed must be on the basis of recognised employment relationships established through national law and practice. For the avoidance of any doubt, this requires the Manufacturer to engage its workforce by using contracts of employment (i.e. a contract of service and not any other kind of contract for the provision of services) wherever possible. The creation of some relationship other than that of a contract of employment will not be justified by the worker in question expressing a preference for that other kind of relationship, unless no other appropriately skilled workers could be engaged; and
 - (B) obligations to employees under labour or social security laws and regulations arising from the regular employment relationship shall not be avoided through the use of labour-only contracting, subcontracting, or home-working arrangements, or through apprenticeship schemes where there is no real intent to impart skills or provide regular employment, nor shall any such obligations be avoided through the excessive use of fixed-term contracts of employment; and

- (ix) no harsh or inhumane treatment is allowed, and physical abuse or discipline, the threat of physical abuse, sexual or other harassment and verbal abuse or other forms of intimidation shall be prohibited.
- (b) The Manufacturer shall manage and monitor adherence to these minimum requirements throughout its supply chain and report any non-compliance and remedial actions to the Purchaser.
- (c) The Manufacturer shall comply with national and other applicable law and, where the provisions of law and these provisions address the same subject, the provision which affords the greater protection should be applied. These principles shall not dilute any other related provisions under this Agreement.
- (d) The Manufacturer shall undertake a risk analysis of its supply chain to identify any areas where unethical labour practices may occur. In the event that areas of risk are identified by the Manufacturer, the Manufacturer shall detail in the Responsible Procurement Plan the action that will be undertaken by the Manufacturer to map the at-risk supply chains and provide information on the labour conditions at relevant production sites. The Manufacturer shall then, in conjunction with the Purchaser, detail what remedial action will be undertaken to achieve compliance in accordance with Ethical Sourcing Practices. Where risks are identified the Manufacturer shall undertake social audits of production sites.
- (e) As soon as practicable following the Commencement Date, the Manufacturer shall register itself with an ethical supplier database, such as SEDEX (Supplier Ethical Data Exchange). The Manufacturer agrees that for the duration of this Agreement, it shall permit and enable the Purchaser to have access to the information in relation to the Manufacturer that subsists in such ethical supplier database.
- (f) During the course of this Agreement, the Purchaser has the right to request that the Manufacturer carries out one or more audits using a reputable auditor to verify whether the Manufacturer is complying with the Ethical Sourcing Practices. The identity of the auditor is to be approved by the Purchaser, such approval not to be unreasonably withheld or delayed. The costs of the audit shall be borne by the Purchaser.
- (g) If the Purchaser has reasonable cause to believe that the Manufacturer is not complying with any of the Ethical Sourcing Practices, then the Purchaser shall notify the Manufacturer and the Parties shall agree an action plan with appropriate timeframes for compliance by the Manufacturer (the "**Action Plan**"), such Action Plan to be agreed by the Parties by no later than one calendar month from the date of the Purchaser notifying the Manufacturer that remedial action is required or such other period as the Parties may otherwise agree in writing. The costs of the creation and implementation of the Action Plan shall be borne by the Manufacturer.

2.8 **London Living Wage**

- (a) Without prejudice to any other provision of this Agreement, the Manufacturer shall, and shall use reasonable endeavours to ensure that Subcontractors shall, pay their employees an hourly wage (or equivalent of an hourly wage) of not less than the London Living Wage where those employees are spending all of their working time on the Works within one of the London Boroughs.
- (b) The Manufacturer shall audit the records of its Subcontractors to ensure compliance with payment of the London Living Wage and notify the Purchaser of any non-compliance.

- (c) The Manufacturer shall, and shall use reasonable endeavours to procure that its Subcontractors shall, allow the Purchaser access to their records for the purposes of auditing compliance with the requirement to pay employees the London Living Wage.
- (d) In the event that the Manufacturer or the Purchaser discovers any non-compliance with the requirements of this paragraph 2, the Manufacturer shall co-operate fully with the Purchaser to resolve the non-compliance.
- (e) The Manufacturer shall disseminate on behalf of the Purchaser to its employees and Subcontractors engaged in provision of the Works such perception questionnaires as the Purchaser may reasonably require from time to time and promptly (and, in the case of any Subcontractor, use reasonable endeavours to ensure that such Subcontractor will) collate and return to the Purchaser responses to such questionnaires.
- (f) Apprentices will be excluded from payment of the London Living Wage and will be paid as a minimum the normal rate for an Apprentice as defined in the appropriate national agreement or other similar document.

3. **WORK RELATED ROAD RISK**

3.1 **Definitions**

For the purposes of this paragraph 3, the following definitions shall apply:

"Bronze Accreditation" means 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" means 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" means a report detailing all collisions during the previous 12 months involving injuries to persons or fatalities;

"Delivery and Servicing Vehicle" means a Lorry, a Van or a Car-derived Van;

"Driver" means any employee of the Manufacturer and any Subcontractor (including an agency driver) who operates Delivery and Servicing Vehicles on behalf of the Manufacturer while engaged in or in relation to the provision of the Works;

"DVLA" means the Driver and Vehicle Licensing Agency;

"FORS" means the Fleet Operator Recognition Scheme, which is an accreditation scheme for businesses operating van and lorry fleets. It is free to join and offers impartial, independent advice and guidance to motivate companies to improve their compliance with relevant laws and their environment, social and economic performance;

"FORS Standard" means 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" means the highest level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk;

"Lorry" means a vehicle with a MAM exceeding 3,500 kilograms;

"MAM" means 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" means 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; and

"Silver Accreditation" means the intermediate level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk; and

"Van" means a vehicle with a MAM not exceeding 3,500 kilograms.

3.2 **Fleet Operator Recognition Scheme Accreditation**

The Manufacturer shall within 90 Working Days of the Commencement Date:

- (a) (unless already registered) register for FORS or a scheme which in the reasonable opinion of the Purchaser is an acceptable substitute to FORS (the **"Alternative Scheme"**); and
- (b) (unless already accredited) have attained the standard of Bronze Accreditation (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 Manufacturer has attained Silver Accreditation or Gold Accreditation the maintenance requirements shall be undertaken in accordance with the periods set out in the FORS Standard.

3.3 **Safety Equipment on Vehicles**

The Manufacturer shall ensure that every Lorry which is used to provide the Works shall:

- (a) have Side Guards, unless it can be demonstrated, to the reasonable satisfaction of the Purchaser, that the Lorry will not perform the function for which it was built if Side Guards are fitted;
- (b) have 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;
- (c) have equipment fitted with an audible means of warning other road users of the Lorry's left manoeuvre; and
- (d) have 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.

3.4 **Driver Licence Checks**

The Manufacturer shall ensure that:

- (a) it has a system in place to ensure all 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; and
- (b) each Driver 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 Manufacturer's risk scale, provided that the Manufacturer's risk scale has been Approved by the Purchaser in the previous 12 months. Points incurred on a driving licence within 12 months of any check:

0 - 3 points - annual checks;

4 - 8 points - six (6) monthly checks;

9 - 11 points - quarterly checks;

12 or more points - monthly checks.

3.5 **Driver Training**

The Manufacturer shall ensure that each Driver 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 life of this Agreement.

3.6 **Collision Investigations, Collision Reports and FORS Reports**

- (a) From the Commencement Date, in the event of a collision involving the Manufacturer's freight vehicles, the Manufacturer shall:
 - (i) provide an initial Collision Report to the Purchaser Contract Manager and a copy to the Purchaser as soon as is practicable after the collision and in any case not more than 24 hours after the collision;
 - (ii) undertake a collision investigation as soon as practicable after the collision; and
 - (iii) provide a Collision Report to the Purchaser Contract Manager and a copy to the Purchaser within a reasonable time following the collision and in any case within 21 days of the conclusion of the collision investigation.
- (b) The Manufacturer shall within 30 days of becoming a FORS Bronze member or, if an existing member, within 30 days of the Commencement Date:
 - (i) make a written report to the Purchaser providing a copy to the Purchaser Contract Manager, detailing the use of any Subcontractors of any tier and compliance with the requirements in paragraphs 3.3 (Safety Equipment on Vehicles), 3.4 (Driver Licence Checks) and 3.5 (Driver Training); and
 - (ii) provide updates of the report to the Purchaser, as well as providing a copy to the Purchaser Contract Manager, every three (3) months following the Manufacturer's initial report.

3.7 **Self-Certification of Compliance**

The Manufacturer shall, before any freight movements are undertaken under this Agreement, and no later than 90 Working Days from the Commencement Date, make a written report to the Purchaser detailing its compliance with paragraph 3 of this schedule 14 (the "**WRRR Self-certification Report**"). The Manufacturer shall provide updates of the WRRR Self-certification Report to the Purchaser on each three (3) month anniversary of its submission of the initial WRRR Self-certification Report.

3.8 **Collision Reporting**

From the Commencement Date, the Manufacturer shall:

- (a) ensure 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
- (b) within 15 Working Days of the Commencement Date provide a Collision Report to the Purchaser. The Manufacturer shall provide to the Purchaser an updated Collision Report within five (5) Working Days of a written request from the Purchaser.

3.9 **Duty of the Manufacturer relating to Subcontractors**

The Manufacturer shall ensure that each Subcontract in relation to this Agreement contains provisions passing down the requirements set out in this paragraph 3.

3.10 **Failure to comply with any work related road risk requirements**

Without limiting the effect of any other provision of this Agreement relating to termination, if the Manufacturer or any Subcontractor fails to comply with any of the requirements set out in this schedule 14:

- (a) the Manufacturer has committed a material breach of this Agreement; and
- (b) the Manufacturer, its employees, agents and Delivery and Servicing Vehicles, operated by the Manufacturer or any Subcontractor, may be refused entry to any property that is owned, occupied, managed by, or under the responsibility of the Purchaser and no relief shall be provided to the Manufacturer under this Agreement.

4. **SUPPLY CHAIN MANAGEMENT**

4.1 **CompeteFor**

- (a) The Manufacturer shall use the "CompeteFor" web-sourcing portal, or any successor system, to advertise all 'appropriate Subcontracts' and supplier opportunities which arise through this Agreement. **"Appropriate Subcontracts"** in this context means those Subcontract opportunities that do not have preferred Key Subcontractors as specified by the Manufacturer in the Manufacturer Train Proposal.
- (b) Unless otherwise agreed with the Purchaser, the Manufacturer shall only publish a 'Contract Opportunity' when posting opportunities on "CompeteFor".
- (c) The Manufacturer shall use a naming convention as specified by the Purchaser for all opportunities the Manufacturer posts on "CompeteFor".
- (d) The Manufacturer shall use reasonable endeavours to ensure that Subcontractors use the "CompeteFor" web-sourcing portal, or any successor system, to advertise further opportunities within the Manufacturer's supply chain.
- (e) The Manufacturer shall monitor the number, type and value of "CompeteFor" contract opportunities advertised and awarded in its supply chain.

APPENDIX 1**Responsible Procurement Performance Review and Action Plan Template**

Agreement Title:				
Agreement Description:				
Manufacturer Name:				
Requirement Description	Manufacturer's statement of compliance with requirement	Action taken by Manufacturer since previous TfL Period	Proposed action to be taken by Manufacturer during next TfL Period	Action taken by Manufacturer within supply chain to implement this requirement during previous TfL Period
"CompeteFor"				
Meet the Buyer Event				
Community Relations				
Strategic Labour Needs and Training Plan (including submittal of the Strategic Labour Needs and Training Monitoring Report)				
Ethical Sourcing Practices				

APPENDIX 2

Strategic Labour Needs and Training Monitoring Report Template

Organisation
TfL Contract/Project
Date
SLNT Reporting Period

SLNT Category	TfL Priority	Numbers				Additional Detail/Information
		Annual Target	Annual Forecast	Outputs this Period	Outputs to Date	
Worklessness						
- Apprentices (FTE)	Y					
- Job Starts (FTE)	Y					
- Placement Positions (Nos)	Y					
New Entrants						
- Apprentices (FTE)	Y					
- Job Starts (FTE)						
- Graduates (FTE)						
Trainees						
- Placement Positions (Nos)						
- Taster Positions (Nos)						
Current Workforce						
- Adult Apprentices (FTE)	Y					
- Workforce Skills (Days)						
Educational Activities (days)						
Additional Information						
Highlights						
Issues/Concerns/Risks						

APPENDIX 3

Responsible Procurement Schedule Requirements

The Manufacturer shall provide and maintain a detailed procurement schedule in Excel format, unless agreed otherwise with the Purchaser, substantially in the form below (the "**Responsible Procurement Schedule**") identifying:

- all packages, proposed and actualised purchase orders, Subcontracts, supplies and service orders including training;
- work scope / packages proposed to be performed direct by the Manufacturer;
- planned, forecast and actualised milestone dates for each of the procurement activities;
- estimated or actual values of the planned packages; and
- all other relevant information as required by the Responsible Procurement Schedule template. For all Key Subcontractors the Manufacturer shall complete all fields of the Responsible Procurement Schedule. For all other Subcontractors the Manufacturer may choose not to complete fields F, G, H and M.

For Subcontracts where significant subcontracting by Subcontractors is anticipated, the Manufacturer shall unless otherwise agreed by the Purchaser, ensure that Subcontractors similarly complete, submit to the Manufacturer and keep updated a Responsible Procurement Schedule in respect of their part of the Works, which shall reflect the same level of information in respect of subcontractor procurement as that required under this Agreement.

Responsible Procurement Schedule

A	B	C	D	E	F	G	H
Package/ Contract No.	Work Package Description	Package Value (£) Estimated/ Actual	Possible Subcontractor(s) or In-house	Company Registration Number(s)	Procurement Route (ITT/SS)	"Compete For" (Y/N)	"CompeteFor"- Opportunity posting date

I	J	K	L	M	N	O	P	Q	R
Contract Status	ITT Issue Date	Awarded Subcontractor	Target / Actual Award Date	Form of Contract	Contract Start Date (on site)	Target / Actual Completion Date	Country and Post Code where Works or Services will be undertake n	SME?	Comments

APPENDIX 4

SLNT Plan

SCHEDULE 15

Open Book Accounting

1. The Manufacturer shall maintain on a current and accurate basis, books of account relating to the performance of this Agreement, and in so doing shall observe and comply with such accounting conventions, policies and requirements as the Purchaser may from time to time specify after consultation with the Manufacturer, provided that these are compatible with generally accepted accounting practice in the UK and Good Industry Practice.
2. In relation to any Compensation Event, Change in Law or Change (for the purposes of this schedule 15, "**Eligible Changes**") the Manufacturer shall adopt a system of "open book" accounting which permits all components of income, costs, overheads, depreciation, taxes, tax allowances, discounts, provisions, and other financial adjustments and profit in relation to the same to be separately identified and allocated and shall make such information available to the Purchaser.
3. The Manufacturer shall further:
 - 3.1 nominate an individual with specific responsibility for the preparation and maintenance of financial, commercial and management information required under this Agreement; and
 - 3.2 maintain and provide that information in a form required by this Agreement and provide any summary of that information as reasonably required by the Purchaser.
4. In relation to any Eligible Changes, the Manufacturer shall afford or procure for the Purchaser (including advisers, consultants and agents acting on behalf of the Purchaser) and any party entitled under any law to audit or review this Agreement such access to such information, books of account, records and documentation (including any stored in digital form) and personnel of the Manufacturer as relates to such matters and as it or they reasonably consider necessary for the performance of their duties and shall provide copies of the same on demand, at the Purchaser's cost.
5. The Purchaser may nominate representatives to undertake any financial or management audit of the Manufacturer. These nominees shall be allowed direct access to both the Manufacturer's personnel and all management information (including computer stored data and systems). The Manufacturer shall at its own expense provide all reasonable support to those nominees in the discharge of their functions.
6. Subject to and in accordance with the provisions of this Agreement, the Purchaser may at any time and on reasonable prior notice undertake any inspection, audit or check of any aspect of the Manufacturer's performance of this Agreement as required by the Purchaser or TfL. The Manufacturer shall at its own expense promptly provide all reasonable co-operation in relation to any inspection, audit or check including:
 - 6.1 making any documents and records available for inspection and at the Purchaser's cost, providing a reasonable number of copies of any documents or records requested and/or granting copying facilities for the purposes of making such copies; and
 - 6.2 complying with the Purchaser's reasonable request for access to personnel engaged in the Manufacturer's performance of this Agreement.
7. The Manufacturer shall keep and operate in an appropriately secure environment, fitted with reliable user authentication and access control mechanisms in accordance with Good Industry Practice, all information technology systems or networks which process financial data where the modification or destruction of such data might give rise to a fraud or financial impropriety. The Manufacturer shall consult with the Purchaser on such systems prior to their use in respect of information belonging to the Purchaser, and the

Manufacturer shall implement any systems in relation to the same as reasonably required by the Purchaser.

8. The Manufacturer shall provide such other routine or special written or oral financial and management reports as the Purchaser reasonably considers necessary in respect of a part or the whole of the Manufacturer's activities under this Agreement.

SCHEDULE 16

Health, Safety and Environment

1. GENERAL

- 1.1 The Manufacturer shall have responsibility for all health, safety and welfare matters associated with the Works. The Manufacturer shall also be responsible for liaison with the Purchaser and its industry partners on health and safety matters affecting the Works.
- 1.2 The Manufacturer shall nominate a senior director ("**Health and Safety Director**") (typically a director identified as responsible for health and safety) and respond promptly if the Purchaser requests a meeting with a senior representative from the Manufacturer to discuss any notifiable or reportable event, adverse trends or other evidence of a serious non-compliance with legislation or health and safety requirements.
- 1.3 The Manufacturer shall take cognisance of good practice guidance and other publications produced by the Purchaser, TfL, ORR, RSSB, Network Rail or any other Competent Authority relevant to health, safety and welfare in terms of its activities. The Manufacturer shall participate in relevant health, safety and environment forums, developed by these partners, for sharing good practice during the Works.
- 1.4 The Manufacturer shall provide to the Purchaser until Acceptance of the last Train in each Fleet an annual report detailing its assessment of its health and safety performance for the previous year, including details of any significant health, safety and environment accidents or incidents and the improvement actions it intends to implement to improve the performance during the following year.
- 1.5 The Manufacturer shall ensure that all Subcontractors either:
 - (a) comply with the Manufacturer's own health and safety management systems as detailed in paragraphs 2.2 and 2.3 below; or
 - (b) comply with their own health and safety systems which in themselves shall be consistent with and covers all aspects of the requirements set out in paragraphs 2.2 and 2.3 below.

2. HEALTH AND SAFETY PLAN

- 2.1 The Manufacturer shall develop and implement a health and safety plan ("**H&S Plan**") which shall be consistent with the following provisions:
 - (a) the Manufacturer's own health and safety management systems detailed in paragraphs 2.2 and 2.3 below;
 - (b) the Rail and Underground Health, Safety and Environment Policy; and
 - (c) the CPD Health, Safety and Environmental Strategy.
- 2.2 The Manufacturer's health and safety systems shall comply with all relevant statutory health, safety and welfare requirements and shall develop processes and programmes for delivery of excellence in health and safety performance (the "**H&S Programme**"). The H&S Programme should seek to continually improve performance. Specific areas for development within the H&S Programme shall include, but are not be limited to, the following in pursuit of good industry practices:
 - (a) design, manufacture and construction management;
 - (b) procurement of people, plant and materials;

- (c) competence management of staff and contractors;
- (d) maintenance of plant and equipment;
- (e) proactive occupational health management of staff and contractors;
- (f) cooperation and coordination with the Purchaser and its industry partners; and
- (g) delivery of Trains to the Delivery Depot.

2.3 The Manufacturer shall:

- (a) have in place at all times an appropriate occupational health and safety management system that complies with BS OHSAS 18001 or equivalent at the Manufacturer's Premises, any other principal Train manufacturing sites, and all relevant testing sites;
- (b) develop and implement a drugs and alcohol policy consistent with LUL Standard S1251 "Alcohol and Work" and LUL Standard S1257 "Drugs and Work"; and
- (c) develop and implement a workplace violence policy which is consistent with the principles of LUL Standard S5265 "Workplace Violence Standard".

2.4 Promptly upon a request from the Purchaser, the Manufacturer shall provide evidence satisfactory to the Purchaser of such health, safety and welfare systems.

2.5 The Manufacturer shall submit the H&S Plan to the Purchaser for Approval no later than 3 months after the Commencement Date.

2.6 The Manufacturer shall develop and submit annually (or more frequently as the Purchaser may in its absolute discretion determine) to the Purchaser for Approval, an updated H&S Plan which shall as a minimum include:

- (a) any updates to the previously Approved H&S Plan;
- (b) a summary of the previous period's health and safety performance data, showing both leading and lagging indicators, including inter alia, details of any significant health and safety accidents or incidents and the improvement actions undertaken or planned to be undertaken; and
- (c) proposed health and safety improvement targets together with commentary on the achievement of the previous period's improvement objectives.

2.7 The Manufacturer acknowledges that the Purchaser sets its contractors a number of health and safety objectives which are in line with the CPD Health, Safety and Environment Strategy. Each objective is associated with a number of performance areas and quality criteria which allow the Purchaser to systematically measure contractor's health and safety performance against set objectives.

2.8 The Purchaser may, on a quarterly basis, carry out "Supplier Maturity Assessments" with the Manufacturer using the applicable criteria. The results shall be discussed and shared with the Manufacturer and the Manufacturer will be required to work with the Purchaser to achieve the health and safety objectives.

3. **TRAIN DELIVERY HEALTH AND SAFETY PLAN**

3.1 The Manufacturer shall develop and implement Train delivery health and safety plans ("**Delivery H&S Plans**"), which shall be consistent with the following provisions:

- (a) the Manufacturer's own health and safety management systems as detailed in paragraphs 2.2 and 2.3 above;
 - (b) the Rail and Underground Health, Safety and Environment Policy; and
 - (c) all applicable elements of the Contract QUENSH Conditions as stated in LUL Standard S1552 and summarised in the QUENSH Contract Menu using the template set out in Appendix 1 to this schedule 16 (as deemed appropriate by the Purchaser).
- 3.2 Each Delivery H&S Plan shall include as a minimum the following:
- (a) method statements and risk assessments that demonstrate a safe system of work in the delivery and handover of the Trains to the Delivery Depot;
 - (b) all necessary statutory notices required to transport the Trains; and
 - (c) a detailed programme of activities required to meet the Delivery H&S Plan.
- 3.3 The Manufacturer shall submit each Delivery H&S Plan to the Purchaser for Approval no later than 6 months prior to delivery of the relevant Train.
- 3.4 The Manufacturer shall submit an updated Delivery H&S Plan to the Purchaser for Approval on the occurrence of any of the following:
- (a) any material change in the Delivery H&S Plan requirements;
 - (b) any delay in any relevant Contractual Acceptance Date; or
 - (c) any incident that affects the Delivery Depot, the Purchaser's staff or contractors or that requires investigation by the HSE or ORR.
- 3.5 Without prejudice to the Manufacturer's obligation to obtain consent from the Purchaser, should a Delivery H&S Plan require the Manufacturer to undertake temporary works on any Delivery Depot then for the duration of the temporary works, the Manufacturer shall ensure it:
- (a) adheres to all health and safety requirements for such Delivery Depot;
 - (b) collates and submits to the Purchaser health and safety performance data in relation to any RIDDOR incidents and/or Lost time incidents that occur in relation to the Delivery H&S Plan Works (this information shall be submitted every Tfl Period); and
 - (c) conducts proactive inspections and monitoring of the Designated Depot for the duration of the temporary works. This information shall be submitted every Tfl Period.

Appendix 1
QUENSH Contract Menu

Appendix 2

Environmental Plan

1. Environmental Plan

- 1.1 The Manufacturer shall develop and implement an environmental plan ("**Environmental Plan**") which shall be consistent with the provisions of the following:
- (a) the Manufacturer's own environmental management systems, which shall be certified to BS EN ISO14001 by a United Kingdom Accreditation Service ("**UKAS**") (or equivalent) accredited certification body;
 - (b) the Rail and Underground Health, Safety and Environment Policy; and
 - (c) the TfL Corporate Environment Framework.
- 1.2 The Manufacturer shall ensure that the scope of the UKAS certification covers the Works. If any proposed or actual changes to the status of the UKAS certification occurs, the Manufacturer shall immediately inform the Purchaser.
- 1.3 The Environmental Plan shall include:
- (a) the Manufacturer's environmental policy statement, endorsed by the Chief Executive Officer or equivalent board member of the Manufacturer, setting out the Manufacturer's environmental objectives for the term of this Agreement and demonstrating a commitment to the management of environmental matters in accordance with this Agreement;
 - (b) a copy of the Manufacturer's ISO 14001 certification or equivalent;
 - (c) a description of the Manufacturer's environmental management system structure, which shall be consistent with the principles of BS EN ISO 14001 or equivalent standard, together with the systems and processes that are employed for ensuring that environmental and sustainability aspects are considered and, where practicable, incorporated into the design and manufacture of the Train;
 - (d) proposals for undertaking environmental appraisals during design development, particularly in respect of the key performance indicators set out in paragraph 1.3(i) below, together with any improvement processes resultant on the findings of such appraisals;
 - (e) an environmental staffing plan describing the Manufacturer's environmental management organisation structure, identifying roles, accountabilities and responsibilities, and points of liaison with the Purchaser;
 - (f) a description of how the Manufacturer shall ensure that its Subcontractors either:
 - (i) comply with the Environmental Plan; or
 - (ii) comply with their own environmental management system;
 - (g) an Environmental Product Declaration ("**EPD**"), in accordance with the international standard ISO 14025 (Type III Environmental Declarations).
 - (h) consideration of the use of products that qualify for Enhanced Capital Allowances by purchasing or hiring energy efficient (including fuel efficient) equipment where it is cost effective and chosen from the Energy Technology List; and

- (i) the Manufacturer's key sustainability goals and associated environmental key performance indicators together with proposed incentive programmes which meet or are aligned to the objectives within the TfL Corporate Environment Framework, the key themes of which are:
 - (i) carbon, energy and climate resilience;
 - (ii) indicating how it will minimise dust release into the atmosphere;
 - (iii) attenuation of air borne noise in service;
 - (iv) materials and resources management; and
 - (v) the avoidance of hazardous materials and the prevention of pollution, including but not limited to paints/thinners containing volatile organic compounds, or products containing rare earth metals.
- 2. The Manufacturer shall submit the Environmental Plan to the Purchaser for Approval no later than 3 months after the Commencement Date.
- 3. The Manufacturer shall develop and submit annually to the Purchaser for Approval, an updated Environmental Plan which shall as a minimum include:
 - 3.1 any updates to the previously Approved Environmental Plan;
 - 3.2 a summary of the environmental statistics for the previous year, including inter alia, environmental reviews and a schedule of products eligible for Enhanced Capital Allowances; and
 - 3.3 proposed environmental improvement targets together with commentary on the previous year's improvement targets (including details of performance against the improvement targets).

Appendix 3

Rail and Underground Health, Safety and Environment Policy

Included on CD entitled "DTUP – MSA LUL Documents".

Appendix 4

CPD Health, Safety and Environmental Strategy

Included on CD entitled "DTUP – MSA LUL Documents".

Appendix 5

TfL Corporate Environment Framework

Included on CD entitled "DTUP – MSA LUL Documents".

SCHEDULE 17

Design Management

1. INTRODUCTION

- 1.1 The Manufacturer shall design the Trains and Equipment with all due skill, care, diligence, prudence and foresight to be expected of appropriately qualified and experienced professional designers and engineers with experience in carrying out work of a similar scope, type, nature and complexity to that required under this Agreement.
- 1.2 The Manufacturer shall ensure that the Train and Equipment Design is:
- (a) planned and managed in accordance with a formal, structured, documented and auditable process;
 - (b) undertaken by competent personnel;
 - (c) subject to regular planned Train and Equipment Design reviews; and
 - (d) checked by the Manufacturer at all stages of the Train and Equipment Design using persons who were not directly responsible for producing the Train and Equipment Design.
- 1.3 The Train and Equipment Design process shall take into account the full life cycle of the Train and Equipment including, but not limited to:
- (a) manufacture;
 - (b) testing and commissioning;
 - (c) hand-over and acceptance;
 - (d) deployment, including mixed fleet operation with the Purchaser's existing rolling stock;
 - (e) condition monitoring;
 - (f) maintenance;
 - (g) storage;
 - (h) refurbishment;
 - (i) disposal and recyclability;
 - (j) making provision to collect service performance, fault and defect information to be made available in an appropriate format to support the efficient maintenance and operation of the Trains and Equipment; and
 - (k) Obsolescence, particularly regarding safety-related items, microcomputers, microprocessors, integrated circuits and software.
- 1.4 The Manufacturer shall, from the Commencement Date until at least to the end of the Concept Design Phase, carry out "Day In the Life Of The Train" exercises with the Purchaser to enable the Manufacturer to better understand the intended operation and maintenance of the Trains and Equipment, including by reference to the relevant Designated Depots (or other locations where Equipment is to be operated and maintained,

as appropriate), on the assumption that the Purchaser Depot Works have been completed. The findings from this exercise shall be incorporated into the Train and Equipment Design.

2. **DESIGN MANAGEMENT PLAN**

2.1 The Manufacturer shall prepare an updated version of the Design Management Plan and submit this to the Purchaser for Approval within six (6) months of the Commencement Date. The updated Design Management Plan shall be consistent with previous versions of the Design Management Plan and shall reflect:

- (a) the Train and Equipment Design strategy, which will describe how the Manufacturer will produce an integrated, assured and certified Train and Equipment Design and how this will be translated into consistent Train and Equipment manufacture;
- (b) the Train and Equipment Design organisation the Manufacturer plans to put in place to undertake the Train and Equipment Design;
- (c) the programme for Design Submissions required pursuant to paragraphs 4.2 and 5 to 8 of this schedule 17;
- (d) the "Day In The Life Of The Train" exercises referred to in paragraph 1.4 above;
- (e) the Train and Equipment Design review and verification procedures and the link with the Assurance Stage reviews and the Assurance Submissions; and
- (f) management processes for:
 - (i) configuration management;
 - (ii) technical change control;
 - (iii) defect and corrective action reporting;
 - (iv) hazard management;
 - (v) Interface management;
 - (vi) Standards management;
 - (vii) systems engineering;
 - (viii) requirements management; and
 - (ix) document management.

2.2 The Manufacturer shall keep the Design Management Plan up to date and any revisions to it shall be submitted by the Manufacturer to the Purchaser for Approval.

3. **ENGINEERING "V" LIFE CYCLE**

3.1 The Manufacturer shall implement systems engineering techniques to identify, control and reduce the risks associated with the interaction between the Trains, LUL Network, all other Interfaces and their effective integration. The Manufacturer shall perform its obligations under this Agreement in a manner that minimises, to the extent reasonably practicable, such risks and facilitates the Acceptance of the Trains and Equipment.

3.2 In performing its obligations under this Agreement, the Manufacturer shall implement an engineering "V" life-cycle model in accordance with BS EN 50126: (Railway Applications – The specification and demonstration of Reliability, Availability, Maintainability and Safety).

- 3.3 In complying with paragraph 3.2 the Manufacturer shall conduct a review at the end of each of the stages that it has identified in its engineering "V" life-cycle model in respect of the design, manufacture, testing, commissioning and supply of the Trains and Equipment so as to demonstrate that the Works are being conducted effectively and correctly. The Manufacturer will notify the Purchaser not less than ten (10) Working Days in advance of each review and will:
- (a) permit the Purchaser to observe any aspect of the review; and
 - (b) submit to the Purchaser for information in advance of each review, any documentation, information, design, drawing, calculation, schedule, sample, pattern or model relating to that review.
- 3.4 As a minimum the Manufacturer shall conduct a review referred to in paragraph 3.3 above at the end of each of the following stages:
- (a) for the Base Order, Concept Design (as described in paragraph 6);
 - (b) for the Base Order, Preliminary Design (as described in paragraph 7);
 - (c) for each Fleet, Final Design (as described in paragraph 8);
 - (d) at the end of each of the Assurance Stages;
 - (e) Provisional Acceptance of the first Train to be Provisionally Accepted;
 - (f) Final Acceptance of the first Train in each Fleet to be Finally Accepted; and
 - (g) Fleet Acceptance of each Fleet.
- 3.5 The Manufacturer shall prepare a report to confirm the acceptable status of engineering management activities. This report shall be updated as necessary and presented as part of the review.
- 3.6 The Manufacturer shall notify the Purchaser in writing when it has completed a review and shall send the results of the review to the Purchaser for Approval.

4. **REVIEWS AND SUBMISSIONS**

Consultation

- 4.1 Without prejudice to the formal submission process for Approval referred to in paragraph 4.2 below, the Parties may, prior to the formal submission, consult in the following manner:
- (a) provision of draft documents for the Purchaser's information and comment to achieve a level of understanding of each Design Submission's content to facilitate a timely formal review; and
 - (b) between the Train and Equipment Design review meetings referred to in paragraph 9, the Parties shall maintain an informed dialogue with each other.

Formal submission process for Approval

- 4.2 The Parties shall, notwithstanding paragraph 4.1 above, use the following submission process to exchange Train and Equipment Design information, and allow the Purchaser to review Design Submissions and Approve the relevant Assurance Submissions:

- (a) Design Submissions and reviews on parts of the Train and Equipment, which can take place at any time during Train and Equipment Design;
- (b) Concept Design Submission, Preliminary Design Submission and Final Design Submission and reviews, each of which shall cover all aspects of the Train and all aspects of each item of Equipment. These will draw together the Design Submissions; and
- (c) Assurance Submissions pursuant to schedule 6 (Assurance).

5. SUBMISSION OF DESIGN INFORMATION

5.1 The Manufacturer shall submit Design Submissions to the Purchaser for review and Approval during the Train and Equipment Design to enable each of the Manufacturer and Purchaser to have confidence that the Train and Equipment Design is progressing correctly in accordance with the requirements. The Manufacturer acknowledges that, for the period up to Final Design Submission (and in relation to each design deliverable due during that period):

- (a) there will be up to two PDPs for the Interface(s) relating to Train-Borne Signalling and that references in this Agreement to the PDP in respect of the Interface(s) relating to Train-Borne Signalling shall be construed as and include references to up to two PDPs in respect of the Interface(s) relating to Train-Borne Signalling; and
- (b) it shall (unless otherwise agreed by the Purchaser) (i) submit separate Design Submissions required by this schedule 17 which are compatible with the signalling system proposed by each PDP in respect of the Interface(s) relating to Train-Borne Signalling (where there are two) indicating to which PDP they relate and (ii) liaise with each such PDP.

5.2 The Manufacturer shall ensure that each of the Design Submissions submitted to the Purchaser shall be progressively revised where necessary to include additional information and/or evidence that have been obtained during Train and Equipment Design activities. Any changes made to the previously Approved Design Submissions shall be resubmitted for Approval.

5.3 The Manufacturer shall ensure that each Design Submission includes:

- (a) identification of the Manufacturer's checking and approval entities required pursuant to paragraph 1.2(d) above;
- (b) a description of the methods followed; and
- (c) a description of the formal analyses undertaken.

5.4 Design Submissions shall demonstrate that:

- (a) the requirements of the Purchaser under this Agreement have been adequately captured and verified;
- (b) the requirements have been embodied in the Train and Equipment Design and confirmed throughout the Train and Equipment Design process;
- (c) consideration has been given to the effect that the scope of the Design Submission has, where relevant, on all other parts of the Train, Equipment or other interfacing assets (in relation to interfacing assets, in accordance with schedule 26 (Systems Integration)); and

- (d) where the Train and Equipment Design has been undertaken by a Subcontractor the proposed Train and Equipment Design solution is fully validated by the Manufacturer.
- 5.5 The Manufacturer shall ensure that all Design Submissions confirm and demonstrate, where appropriate, that:
- (a) the proposed Train and Equipment Design can be consistently and reliably achieved in production and be able to be maintained for its design life;
 - (b) the Train and Equipment Design will optimise reliability, availability, maintainability and safety having regard for the requirements set out in this Agreement;
 - (c) human factors, pursuant to paragraph 19 below, the Train Technical Specification and the Human Factors Integration Management Plan, are an integral part of the Works;
 - (d) the reliability, availability, maintainability and safety of the Train and its components are achievable and verifiable. The Manufacturer must demonstrate compliance with this requirement using recognised methods; and
 - (e) information for the LU Corporate Risk Model has been provided to enable the assessment of the risk from major hazards with the potential to cause fatality to customers and other members of the public has been considered, pursuant to paragraph 17 of this schedule 17.
- 5.6 The Manufacturer shall ensure that the Design Submissions are identified by a logical, sequential numbering system.
- 5.7 The Manufacturer shall ensure that there is a regular flow of Design Submissions to avoid delays to the Project Programme and Key Programme Dates arising from an uneven workload.
- 5.8 The Manufacturer shall review and approve design submissions from its Subcontractors before submission of these to the Purchaser for review. These design submissions shall be in the same format and level of detail as agreed between the Purchaser and the Manufacturer.
- 5.9 The Manufacturer shall submit the Concept Design Submission, Preliminary Design Submission and Final Design Submission to achieve Approval by the Purchaser on the dates shown in the Key Programme Dates.
- 5.10 In undertaking a review of a Design Submission, Concept Design Submission, Preliminary Design Submission or Final Design Submission, the Purchaser shall be entitled to review all evidence included or referenced in that Design Submission and on request by the Purchaser, the Manufacturer shall provide copies of such evidence to the Purchaser in a timely manner.
- 5.11 The Manufacturer shall produce a completion report which shall accompany and be an integral part of each of the Concept Design Submission, Preliminary Design Submission and Final Design Submission. The completion report shall list all individual submissions, their Approval status, compliance with requirements and any other information to support the Design Submission process. The Manufacturer and the Purchaser shall agree the format and content of the completion report prior to formal submission of the completion report.
- 5.12 The Manufacturer shall ensure that each of the Concept Design Submission, Preliminary Design Submission and Final Design Submission reference the applicable Sections of the

Train Technical Specification, all Applicable Laws and Standards and the Manufacturer's quality procedures as required.

- 5.13 The Manufacturer shall ensure that all Design Submissions are in a format which allows the Purchaser to use a search facility.
- 5.14 The Manufacturer shall produce and submit the following failure mode assessments as a minimum and update the documents as required throughout the Train and Equipment Design process and also before the Final Design Submission:
- (a) An assessment of the likely failure modes, and measures to reduce all risks to ALARP.
 - (b) An assessment that confirms, where practicable, that no single point failure shall disable the Train.
 - (c) The measures taken to provide secondary security and retention where appropriate (and a full justification if none is provided), and a structural assessment of them.
 - (d) An assessment of all single point failures and common mode failures and a full description of the mitigation measures adopted to eliminate or control all consequences.
 - (e) Recovery procedures for all credible failure modes.
 - (f) A demonstration of how dormant failures within systems are identified, addressed and reduced to ALARP.

6. **CONCEPT DESIGN SUBMISSION**

- 6.1 The Manufacturer shall submit a Concept Design Submission which shall address all specified Train Technical Requirements for the Trains and Equipment, and the Manufacturer shall ensure that it contains, as a minimum the following:
- (a) a clear explanation of the scope of each section of the submission, for example, "This is the complete Concept Design Submission for the bogie frame";
 - (b) clear drawings, schematics, 3-D models, any documentation, information, design, calculation, parts list, sample, pattern or model relating to that review to the Purchaser for Approval as appropriate, to illustrate the Part being reviewed;
 - (c) sufficient text explanation and description of the subject together with calculations, where applicable, to indicate how requirements of the Train Technical Requirements and Applicable Standards will be met;
 - (d) a clear statement that compliance with the Train Technical Requirements and Applicable Standards will be achieved;
 - (e) a clear statement that the proposed Train and Equipment Design will be safe, fit for purpose and meet the specified reliability and life expectancy requirements;
 - (f) a response to each requirement of the Train Technical Specification and all Applicable Laws and Standards;
 - (g) the Manufacturer's Technical Principles Document pursuant to paragraph 1 of schedule 28 (Technical Information);

- (h) a clear indication of any items which will not be compliant with the Train Technical Specification and Applicable Standards and an explanation of the basis for concession requests to be considered or proposed under the Change Procedure;
- (i) confirmation that specified reliability and maintainability requirements will be achieved by the proposed Train and Equipment Design;
- (j) a draft Train Maintenance Regime;
- (k) an updated Train Maintenance Plan;
- (l) a list of Safety Critical Components pursuant to the Train Technical Specification;
- (m) a draft Reliability Case pursuant to paragraph 12 of this schedule 17;
- (n) confirmation that Interfaces are agreed and defined in terms of design, scope of supply and programme pursuant to schedule 26 (Systems Integration);
- (o) energy conservation measures;
- (p) a list of all notifications and alerts created by the Train monitoring and diagnostics systems (including those relating to condition monitoring) that the Train will make available for use by an on-board operator or for immediate off-train transmission. As a minimum, the list shall state the notification and/or alert text or other method of representation and describe how this information will assist in the speedy and effective resolution of actual or potential issues or failures; and
- (q) information which identifies whether a Hybrid Cooling System can be incorporated into the Train and Equipment Design.

7. PRELIMINARY DESIGN SUBMISSION

- 7.1 The Manufacturer shall submit a Preliminary Design Submission which shall contain evidence of the development of the Train and Equipment Design since Approval of the Concept Design Submission, a clear statement that compliance with the Train Technical Requirements will be achieved and a clear statement that the proposed Train and Equipment Design will be safe, fit for purpose and any risks verified as ALARP.
- 7.2 The Manufacturer shall ensure that the Preliminary Design Submission contains, as a minimum, the following:
 - (a) a clear explanation of the scope of each section of the submission, for example "This is the complete Preliminary Design Submission for the auxiliary supply system";
 - (b) a clear statement of any changes to the Train and Equipment Design as presented at Concept Design Submission that have occurred since Approval of the Concept Design Submission with a full explanation, including appropriate evidence, to demonstrate that compliance with the Train Technical Requirements, Applicable Standards and fitness for purpose is maintained;
 - (c) sufficient clear general arrangement drawings of the Part being reviewed, showing interfaces with and clearances to adjacent equipment, together with sufficient detailed drawings to validate the calculations;
 - (d) sufficient text explanation and description of the subject to indicate how the detailed requirements of the Train Technical Specification will be met;

- (e) a response to each of the requirements of the Train Technical Specification and all referenced Applicable Laws and Standards ;
- (f) a description of the maintenance and overhaul which will be required on the Part under review;
- (g) draft Testing and Inspection Strategy, Schedule of Tests and Inspections and Testing and Inspection Programme in accordance with schedule 7 (Testing and Inspection);
- (h) an update of the Reliability Case that was submitted for Concept Design;
- (i) an updated confirmation that Interfaces are agreed and defined in terms of design, scope of supply and programme pursuant to schedule 26 (Systems Integration);
- (j) the strategy for integration of the Train onto the LUL Network, including all necessary testing and in accordance with schedule 7 (Testing and Inspection);
- (k) a statement defining the design provisions for cyber security pursuant to schedule 27 (Cyber Security);
- (l) a list of all notifications and alerts created by the Train monitoring and diagnostics systems (including those relating to condition monitoring) that the Train will make available for use by an on-board operator or for immediate off-train transmission. As a minimum, the list shall state the notification and/or alert text or other method of representation and describe how this information will assist in the speedy and effective resolution of actual or potential issues or failures; and
- (m) sections on proposed Type Testing and Routine Testing for the Equipment under review.

8. FINAL DESIGN SUBMISSION

- 8.1 The Manufacturer shall submit a Final Design Submission for each Fleet which shall contain evidence of the development of the Train and Equipment Design since Approval of the Preliminary Design Submission or, in the case of WLO Trains, since Approval of the Final Design Submission of the previous Fleet to be Accepted and a clear indication of compliance with the Train Technical Specification and Applicable Standards, with full supporting documentation and a clear statement that the proposed Train and Equipment Design will be safe, fit for purpose and any risks verified as ALARP.
- 8.2 The Manufacturer shall ensure that the Final Design Submission contains, as a minimum, the following:
- (a) any items which are no longer compliant with the Train Technical Specification and Applicable Standards and requests for concessions to be considered or proposed under the Change Procedure;
 - (b) a clear explanation of the scope of each section of the submission;
 - (c) a clear statement of any changes to the Train and Equipment Design as presented at Preliminary Design Submission that have occurred since Approval of the Preliminary Design Submission, with a full explanation, including calculations where applicable;
 - (d) for WLO Trains only, a clear statement of any changes that need to be made to the Train and Equipment Design as contained in any Approved Design Submissions for the Base Order Fleet;

- (e) all relevant Technical Documents;
- (f) a response to each of the requirements of the Train Technical Specification and all referenced Applicable Laws and Standards;
- (g) reports that specifically confirm:
 - (i) compliance with all requirements including Train recovery;
 - (ii) full compliance with all the Train performance requirements; and
 - (iii) that all Interface Control Documents for equipment supplied by PDPs are accepted and approved by all relevant PDPs in accordance with schedule 26 (Systems Integration).
- (h) a clear statement that compliance with the Train Technical Specification has been achieved on a Section by Section basis and a clear statement that the proposed Train and Equipment Design is safe, fit for purpose and risk is ALARP;
- (i) a clear statement that compliance with the Applicable Standards has been achieved;
- (j) a clear statement that the specified reliability, availability and design life of the Train and component life will be achieved by the Train and Equipment Design;
- (k) a clear statement of the measures adopted to conserve energy;
- (l) all necessary documentation to support the Assurance Stage 1 – Design Completion Submission pursuant to schedule 6 (Assurance);
- (m) an up to date and Approved version of the Interface Management Plan;
- (n) an updated version of the Train Maintenance Regime detailing all maintenance requirements, cleaning requirements and documentation in accordance with the requirements of Section 21 of the Train Technical Specification and schedule 28 (Technical Information);
- (o) an updated version of the Train Maintenance Plan that was updated for the Concept Design Submission;
- (p) an update of the Reliability Case submitted at Preliminary Design Submission;
- (q) an updated confirmation that Interfaces are agreed and defined in terms of design, scope of supply and programme pursuant to schedule 26 (Systems Integration);
- (r) evidence that the requirements for cyber security set out in schedule 27 (Cyber Security) have been achieved;
- (s) a list of all notifications and alerts created by the Train monitoring and diagnostics systems (including those relating to condition monitoring) that the Train will make available for use by an on-board operator or for immediate off-train transmission. As a minimum, the list shall state the notification and/or alert text or other method of representation and describe how this information will assist in the speedy and effective resolution of actual or potential issues or failures; and
- (t) sections on proposed Type Testing and Routine Testing for the Equipment under review.

9. **TRAIN AND EQUIPMENT DESIGN REVIEW MEETINGS**

- 9.1 The Parties shall hold Train and Equipment Design review meetings, which shall:
- (a) be used to agree the content and scope of all Design Submissions;
 - (b) ensure that the Train Technical Requirements have been comprehensively captured and presented in a format acceptable to the Purchaser;
 - (c) ratify the methodology of Train and Equipment Design validation and verification;
 - (d) check Train and Equipment Design calculations and testing to be undertaken as part of validation;
 - (e) identify any inherent functionality that is not directly linked to a requirement;
 - (f) identify any aspects of the Train and Equipment Design which the Manufacturer proposes to improve in a subsequent submission and how this will be managed via an auditable change control system;
 - (g) any other Train and Equipment Design related issues; and
 - (h) be fully minuted, recording all proceedings, proposals, conclusions and actions.
- 9.2 Meetings shall not be held more frequently than one meeting per week unless agreed by the Parties acting reasonably.
- 9.3 The meetings will be held at the offices of the Purchaser, unless the Purchaser notifies the Manufacturer otherwise.
- 9.4 The meetings to review the Design Submissions (excluding the Concept Design Submission, Preliminary Design Submission and Final Design Submission) shall be chaired by the Manufacturer.
- 9.5 The meetings to review the Concept Design Submission, Preliminary Design Submission and Final Design Submission shall be chaired by the Purchaser.
- 9.6 Where the scope of the Train and Equipment Design review meeting includes equipment supplied by a Key Subcontractor or PDP, the Manufacturer shall procure that the relevant Key Subcontractor, or the Purchaser shall procure that the relevant PDP, attends the Train and Equipment Design review meeting.
- 9.7 The agenda for the Train and Equipment Design meeting, conclusions reached in the meeting and actions for the Purchaser or the Manufacturer shall be recorded by the party chairing the meeting.
- ## 10. **DESIGN SUBMISSION APPROVALS**
- 10.1 The Purchaser shall either Approve a Design Submission or reject it together with reasons for the rejection and identify what the Manufacturer must do to achieve Approval.
- 10.2 Where there is a need to consider the effect the Train and Equipment Design of one Subsystem has on another Subsystem, the submission of which may be received at a different time, Approval may be granted "subject to" satisfactory review of another Subsystem, which shall be at the Purchaser's discretion.

11. **RELIABILITY, AVAILABILITY, MAINTAINABILITY AND SAFETY ("RAMS")-GENERAL**

11.1 The Manufacturer shall produce: (a) a Reliability, Availability and Maintainability Plan ("**RAM Plan**"); and (b) a safety plan ("**Safety Plan**"), which demonstrate how the Trains and Equipment will meet the RAMS requirements of this Agreement.

11.2 The Manufacturer shall ensure that the RAM Plan:

- (a) describes the activities which shall be conducted to demonstrate how the reliability targets shall be met;
- (b) includes a reliability prediction (which will be no worse than the reliability requirements stated in clause 15 of this Agreement) for each TfL Period from the first TfL Period after the TfL Period in which the first Train is scheduled to commence testing on the Test Track Facilities;
- (c) states how confidence in the reliability will be developed through the Train and Equipment Design, manufacture and test stages such that a high level of confidence in the reliability of the Train is achieved prior to introduction into service;
- (d) states how confidence in the reliability will be developed from that achieved during the initial permitted reliability growth period to achieving the full Service Affecting Failure levels pursuant to clause 15 of this Agreement;
- (e) includes a forecast distribution of event type versus time delay for all Train systems and the effect of these on the reliability targets;
- (f) shows how all areas of the Train shall be subjected to RAM analysis based on internationally recognised methods;
- (g) details how the Manufacturer will comply with the RAM requirements of BS EN 50126;
- (h) identifies the process for demonstrating that the RAM requirements are met and the identity of the RAM methods to be used;
- (i) sets out the arrangements for reliability growth pursuant to clause 15 of this Agreement;
- (j) describes how operational experience will be incorporated back into the production manufacture;
- (k) describes how the documentation produced will satisfy the requirements of LUL Standard 1-212;
- (l) describes the organisation of the RAM team including the position within the Manufacturer's organisation for the Works;
- (m) describes the management of all RAM-related interfaces, including those with PDP provided equipment;
- (n) defines the planned RAM assessments to demonstrate that the system RAM requirements are met by the Train and Equipment Design;
- (o) describes the management of Subcontractors' RAM requirements;
- (p) describes the verification and validation of assessments, including data;

- (q) states the process for validation of RAM requirements during manufacture, installation, commissioning and maintenance;
 - (r) lists the schedule of deliverables for demonstration of reliability, availability and maintainability as described by the RAM Plan;
 - (s) is updated and submitted to the Purchaser for Approval within six (6) months of the Commencement Date; and
 - (t) is regularly updated as the Works progresses (at least as frequently as prior to each Assurance Stage and Design Submission stage) and re-submitted to the Purchaser for Approval.
- 11.3 The Manufacturer shall include in the RAM Plan a hierarchy of degraded conditions which shall as a minimum include the following:
- (a) Train is able to remain in passenger use (Remain);
 - (b) Train is able to remain in passenger use for only a limited period (In service to Designated Depot);
 - (c) Train is able to be taken out of service without passengers being conveyed (Withdraw); and
 - (d) Train is not able to operate, requiring rescue (Sit down).
- 11.4 The Manufacturer shall ensure that the Maintainability Plan element of the RAM Plan describes the activities which shall be conducted to demonstrate how the maintenance targets shall be met.
- 11.5 The Manufacturer shall ensure that each of the RAM Plan and Safety Plan describes any dependencies, links and influences with the other (relevant) Plans.
- 11.6 The Manufacturer shall feed back the findings of the Reliability, Availability and Maintainability analysis conducted iteratively throughout the programme lifecycle (from product design through introduction and service operation) into the Train and Equipment Design as necessary to deliver the required performance.
- 11.7 The Manufacturer shall verify the final reliability, availability and maintainability predictions as far as is practicable by testing after system design has been completed.
- 11.8 The Manufacturer shall demonstrate the reliability of all aspects of the Trains and Equipment under conditions representative of service conditions.
- 11.9 The Manufacturer shall ensure that failure rates when stabled (for example, de-energised, energised-but-unstressed) are shown separately from those when in service (for example, stressed).
- 11.10 In the event that the RAM data indicates a shortfall in the required reliability of the Train the Manufacturer shall immediately undertake all necessary actions to ensure the cause of the deficiency is identified and remedial action taken to ensure the target figure is achieved. The Manufacturer shall, on all these occasions, notify the Purchaser and confirm how the shortfall has been satisfactorily resolved.
12. **RELIABILITY AND MAINTAINABILITY**
- 12.1 The Manufacturer shall produce and maintain a reliability case ("**Reliability Case**") in accordance with the requirements of LUL Standard 1-212 A1 "Production of a Reliability Case".

- 12.2 The Manufacturer shall ensure that all Parts are assigned a failure category taking full account of the risks and hazards to which staff and passengers would be exposed, in the event of failure in adverse circumstances, such as in a tunnel between stations.

The categories of failure are as follows:

- (a) causing no delay;
 - (b) causing a delay of 120 seconds or more to the service;
 - (c) causing a delay of 15 minutes or more to the service;
 - (d) causing Train withdrawal; or
 - (e) failure of the Train to enter service at the time-tabled time and place. This category applies to Trains which fail in the Designated Depot or on departure from the Designated Depot such that they do not disrupt the running lines.
- 12.3 The failure analysis produced by the Manufacturer shall include a categorisation of all failures in terms of:
- (a) consequence on Train function and/or performance;
 - (b) potential delay to the service, including initial and/or any cumulative delays due to any manual interventions being required on the Train or time for automatic mitigations to take effect and proposed categorisation as a Service Affecting Failure or a Technical Failure;
 - (c) description of any manual actions/interventions required to support continued Train operation;
 - (d) description of the fault report issued by the Train;
 - (e) time to diagnose a fault in the relevant Designated Depot and time to repair fault in the relevant Designated Depot, culminating in the "Mean Time to Repair"; and
 - (f) the cost of (any) Spare or Consumable replacement items.
- 12.4 The Manufacturer shall manage and document the analysis, conclusions and proposals arising from reliability assessments to a level that demonstrates that the Train will meet the reliability requirements.
- 12.5 The Manufacturer shall ensure that the source of failure data used is stated in all reliability predictions.
- 12.6 The Manufacturer shall ensure that the reliability figures used in the prediction as part of the Reliability Case referred to in paragraph 12.1 are based on information obtained from suitable service experience or from applicable generic data inter alia, in order of preference:
- (a) in-service data from similar equipment operating in the same environment as the Deep Tube Upgrade Programme;
 - (b) test data, from related projects with similar equipment;
 - (c) OEM data; and
 - (d) generic databases, e.g. MIL-HDBK-217 F notice 2, PRISM, or similar.

- 12.7 The Manufacturer shall identify all maintenance activities which take longer than the period between two peak services.
- 12.8 The Manufacturer shall demonstrate how condition monitoring can be optimised to increase the accuracy and efficiency of maintenance warnings as experience is gained in service.
- 12.9 The Manufacturer shall ensure that where the Reliability, Availability and Maintainability analysis identifies any areas of uncertainty with respect to achievement of the required level of service reliability, availability or maintainability, mechanisms for improving confidence are proposed and included in the programme of RAM activities. Such confidence building mechanisms may include Environmental Stress Screening, Accelerated Life Testing and In Service Trials.
- 12.10 The Manufacturer shall ensure that the Purchaser has the ability to change the logic and rules that are used to generate the alerts and notifications from the condition monitoring data.
- 12.11 The Manufacturer shall carry out maintainability demonstrations on Parts, as required by the Purchaser.
- 12.12 The Manufacturer shall deliver maintainability demonstrations sufficiently early in the Train and Equipment Design cycle to permit comments received from the Purchaser to be incorporated in the Final Design Submission.
- 12.13 The Manufacturer shall ensure that the maintainability demonstration process used by the Manufacturer contains a combination of off-train physical mock-ups, computer simulations, CAD modelling and on-train proving exercises. The analysis shall take place throughout the phases of the evolving Train and Equipment Design, and shall:
- (a) prove associated on and off-train tooling and maintenance devices;
 - (b) support training of Purchaser staff and movement towards mature maintenance practices;
 - (c) demonstrate that the possibility of errors during maintenance have been designed out by the Manufacturer as far as is practicable;
 - (d) demonstrate that the proposed Train and Equipment Design can be maintained by the intended user population using only the tools specified in the maintenance manual;
 - (e) demonstrate that all maintenance tasks are capable of being performed safely with negligible risk of unsafe working practices;
 - (f) demonstrate that the Train can be maintained within the constraints of the Designated Depot; and
 - (g) demonstrate that the Train can be maintained within the time and processes stated in the Train Maintenance Regime and the Train Maintenance Plan.

13. **ENGINEERING SAFETY MANAGEMENT**

- 13.1 The Manufacturer shall ensure that the Trains and Equipment are safe, reliable and fit for the purpose of operating in accordance with their Permitted Use. All safety risks shall be eliminated or demonstrated to be ALARP.
- 13.2 The Manufacturer shall submit the Engineering Safety Management Plan to the Purchaser for review and Approval within six (6) months of the Commencement Date. The

Manufacturer shall regularly update the Engineering Safety Management Plan with the Concept Design Submission, Preliminary Design Submission and Final Design Submission, and at each Assurance Stage.

- 13.3 The Manufacturer shall ensure that the Engineering Safety Management Plan:
- (a) is consistent with the Engineering Safety Case and shall consist of the contents set out in Appendix 1 (Engineering Safety Management Plan – Contents) of this schedule 17; and
 - (b) describes the activities which shall be conducted to demonstrate how the safety targets set out in the Train Technical Specification and this schedule 17 shall be met.
- 13.4 Suitable and sufficient risk assessments shall be prepared by the Manufacturer throughout the Project as are necessary to support the required safety deliverables in Appendix 1 to this schedule 17 and the Train Technical Specification. Risk assessment strategies shall be included in the Engineering Safety Management Plan.
- 13.5 Safety reviews shall be conducted by the Manufacturer utilising a structured systems approach to assess all areas of the Train and Equipment Design and the maintenance of the Trains and Equipment to identify, quantify and reduce the risks to be ALARP in accordance with LUL Standard S1521. They shall include:
- (a) Hazard Identification;
 - (b) Hazard Analysis;
 - (c) Risk Assessments and Risk Reduction Assessments; and
 - (d) Failures Modes and Effects Criticality Analysis ("**FMECA**") and Fault Tree Analysis ("**FTA**") to enable the updating of London Underground's Quantitative Risk Assessment ("**LUQRA**").
- 13.6 The Manufacturer shall include within the Engineering Safety Management Plan a schedule of expected engineering safety case submissions.
- 13.7 The Manufacturer shall describe within the Engineering Safety Management Plan how the relationships with the following are to be managed and coordinated:
- (a) the commonality between engineering safety and reliability, availability and maintenance in line with BS EN 50126;
 - (b) how human factors integration, together with the supporting analyses, will be accounted for within the engineering safety management activities; and
 - (c) how the safety of the Train and Equipment is to be demonstrated prior to each Assurance Stage.
- 13.8 The Manufacturer shall, at its own cost, establish and implement independent safety auditing and assessments of its work and practices in accordance with all Applicable Laws and Standards.
- 13.9 The Manufacturer shall have carried out an independent review of all engineering safety case submissions. An independent review is required for Train and Equipment Design and final engineering safety justifications prepared by the Manufacturer. These arrangements shall be described in the Engineering Safety Management Plan.

- 13.10 All safety related analyses and electronic and programmable electronic sub-systems identified to have a SIL 4 safety requirement as defined in the Yellow Book, shall be subject to an assessment by an Independent Safety Assessor ("**ISA**") from a third party organisation appointed by the Manufacturer. The terms of reference for the ISA shall be defined by the Manufacturer and be subject to agreement by the Purchaser.

14. **DRACAS / FRACAS**

- 14.1 The Manufacturer shall establish, document and maintain procedures for, and operate, a DRACAS / FRACAS covering their scope of supply. Intervals between reviews of failures shall not exceed three (3) months.
- 14.2 The Manufacturer shall ensure that DRACAS / FRACAS is used to gather information on the types and causes of faults found in equipment, documentation or software to enable action to correct the faults to be taken in a controlled and timely manner.
- 14.3 The Manufacturer shall ensure that DRACAS / FRACAS is established during the Final Design Phase and is then be applied for each Fleet until the later to occur of (i) the end of the Train Warranty Period for the final Train in that Fleet; and (ii) Fleet Acceptance for that Fleet.
- 14.4 The Manufacturer shall ensure that it records all actual or suspected errors, non-conformances, failures, defects, incidents and accidents arising in relation to, or in connection with, any Trains or item of Equipment and/or any process relating to the design, manufacture, testing, commissioning and supply of any Train or item of Equipment together with details of any remedial actions taken by the Manufacturer and/or any Subcontractor and such information shall be provided to the Purchaser on request.
- 14.5 The Manufacturer shall provide all DRACAS / FRACAS reports, covering faults recorded and actions taken to correct faults, to the Purchaser in order to enable the Purchaser to correct faults, and such reports shall be jointly agreed at the Manufacturer's cost and risk.
- 14.6 The Manufacturer shall ensure that the RAM Plan and the Engineering Safety Management Plan describes the process for such DRACAS / FRACAS.

15. **HAZARD MANAGEMENT**

- 15.1 Each Party shall establish a hazard log as the means of managing all hazards and safety risks (the "**Hazard Log**"). Each Party shall retain possession of their Hazard Log and shall provide reasonable access to the other Party to such Hazard Log upon being given reasonable prior written notice (and in any event not to be less than two (2) Working Days from the date of receipt of such notice).
- 15.2 Each Party shall use their Hazard Log in accordance with the DTUP Hazard Log Procedure to track and manage those hazards which have been properly allocated to it in accordance with the DTUP Hazard Log Procedure. During the Train Warranty Period, each Party shall submit to the other Party any new hazards identified in accordance with the DTUP Hazard Log Procedure.

16. **HAZARD ALLOCATION AND THE ALARP PRINCIPLE**

- 16.1 Where a hazard has been allocated in accordance with the DTUP Hazard Log Procedure as being the sole responsibility of the Manufacturer, the Manufacturer shall be required, in accordance with the requirements of this Agreement to demonstrate that it has managed the risks associated with the hazard such that those risks are "as low as reasonably practicable" ("**ALARP**").
- 16.2 Where a hazard has been allocated in accordance with the DTUP Hazard Log Procedure as being the responsibility of the Manufacturer and another person Including PDPs, the

Manufacturer shall be responsible for co-operating and acting reasonably to reach agreement with that other person or PDPs as to an appropriate strategy for managing the risks associated with the hazard such that those risks are ALARP.

17. **LU CORPORATE RISK MODEL**

- 17.1 The Manufacturer shall contribute information to assist the Purchaser in updating the LU Corporate Risk Model as a consequence of the introduction of the new Train.
- 17.2 The information for the LU Corporate Risk Model shall be supplied by the Manufacturer in a format suitable for import to the ISOGRAPH Reliability Workbench software.
- 17.3 The information for the LU Corporate Risk Model shall be created by the Manufacturer by taking each of the top event risks ("**Top Event Risks**") set out in paragraph 18 and producing Fault and Event Trees for each Top Event Risk resulting from the introduction of the Train.
- 17.4 The information for the LU Corporate Risk Model shall be provided by the Manufacturer at each formal Design Submission stage and shall be updated thereafter as the Train and Equipment Design matures.

18. **TOP EVENT RISKS**

- 18.1 The hazards associated with the following Top Event Risks shall be explicitly addressed by the Manufacturer in the Train and Equipment Design:
 - (a) arcing;
 - (b) collision between Trains;
 - (c) collisions other than between Trains;
 - (d) derailment;
 - (e) explosion;
 - (f) Platform Train Interface;
 - (g) power failure;
 - (h) Train fire; and
 - (i) ventilation.
- 18.2 Controls shall be applied by the Manufacturer to mitigate the following specific risk events:
 - (a) passenger door incident;
 - (b) passenger accident;
 - (c) structural failure of Train component or of car structural member;
 - (d) stalled Train;
 - (e) failure of emergency lighting and ventilation;
 - (f) failure of external lights;
 - (g) failure of warning horn or whistle;

- (h) communications failure; or
- (i) brake failure.

18.3 The following systems and components shall also be considered by the Manufacturer when assessing hazards associated with Top Event Risks:

- (a) those involved in mitigating the risk of platform train interface incidents (including: flooring, doors, and door opening and closing systems, Correct Side Door Enable, OPO CCTV, Passenger Emergency Alarm Brake);
- (b) those involved in mitigating the risk of derailment (including: wheels, bogies, bearings, axles, suspension, mountings, brakes, braking systems and controls);
- (c) those involved in mitigating the risk of collision (including: speed systems, propulsion and their control systems, direction control, Electromagnetic Compatibility ("**EMC**"), brakes, braking systems and controls, interface with signalling);
- (d) those involved in mitigating the risk of fire (virtually everything);
- (e) those involved in mitigating the risk of arcing (virtually everything but specifically protection);
- (f) those involved in mitigating the risk of ventilation failure;
- (g) software in safety systems;
- (h) communication systems;
- (i) auxiliary systems;
- (j) lighting systems;
- (k) any potential disabling failure.

19. **HUMAN FACTORS**

19.1 The Manufacturer shall provide the Human Factors Integration Management Plan pursuant to LUL Standard S1217 Issue A2 with the Preliminary Design Submission for Approval by the Purchaser.

19.2 Human factors assessments shall be conducted by the Manufacturer in accordance with the Human Factors Integration Plan as part of the Train and Equipment Design process, which shall consider the full life cycle of the Train with reference to all:

- (a) relevant personnel, including, the Purchaser's operators and maintainers along with other personnel, including security, breakdown and emergency services;
- (b) normal, abnormal, degraded and emergency modes of operation;
- (c) times of the day and night; and
- (d) climatic conditions.

19.3 Recommendations from the human factors assessments shall be implemented by the Manufacturer or otherwise formally closed with appropriate justification.

20. **STANDARDS MANAGEMENT**

- 20.1 The Manufacturer shall establish and implement a Standards management process that:
- (a) includes the creation and maintenance of a matrix ("**Standards Matrix**") that lists all Standards that apply to the performance by the Manufacturer of its obligations under this Agreement, including Specified Standards; and
 - (b) enables evidence of compliance by the Manufacturer with each of the Standards listed in the Standards Matrix to be provided as part of each Design Submission.
- 20.2 Where a specific clause/section of a Specified Standard is called up in a requirement in the Train Technical Specification, the Manufacturer shall submit in each Design Submission a clause-by-clause or section-by-section response to that clause/section of each Specified Standard as part of the response to that requirement.
- 20.3 Without prejudice to paragraph 20.2, for each British Standard and European Standard, the Manufacturer shall submit in each Design Submission a general "we comply" statement against each Applicable Standard. Any non-compliance with specific clauses shall be highlighted and justified. There is no requirement to submit responses against each clause in each British Standard and European Standard.

21. **REQUIREMENTS MANAGEMENT**

- 21.1 The Manufacturer shall establish and implement a management system that records the Manufacturer's compliance with each of the requirements set out in the Train Technical Specification and, where appropriate, generates more detailed requirements to be used in the Train and Equipment Design. This shall be described in the Requirements Management Plan ("**RMP**").
- 21.2 The Manufacturer shall detail in the RMP how the Manufacturer will manage, validate and verify all of the requirements provided within the Train Technical Specification and any requirements that will be developed within the scope of the Works.

22. **DESIGN FOR RECOVERY IN EMERGENCIES**

- 22.1 Following the Concept Design Submission, but prior to Preliminary Design Submission, the Manufacturer shall participate in a familiarisation exercise with the ERU to learn the different techniques used by the ERU to recover Trains.
- 22.2 The Manufacturer shall use the lessons learned from the familiarisation exercise in paragraph 22.1 to influence the Train and Equipment Design so that the Train can be easily recovered by the ERU anywhere on the LUL Network.

Appendix 1

Engineering Safety Management Plan – Contents

Listed below are the suggested contents of the Engineering Safety Management Plan to be prepared by the Manufacturer.

The Manufacturer may implement an alternative structure of headings provided that the requirements of the listed contents are addressed and this is agreed by the Purchaser.

Where appropriate, the Manufacturer may make reference to existing internal processes for engineering safety management and in such instances copies of such internal processes shall be provided with the Engineering Safety Management Plan.

1. **Safety Policy and Strategy** – brief outline of the Manufacturer's own safety policy, strategy and arrangements for achieving engineering safety for the Works.
2. **Scope of the Plan** - what is covered, and what is not covered, by the Engineering Safety Management Plan and with reference to the scope of the Works. Any constraints or assumptions relating to the scope of the Safety Engineering Plan should be described.

Explanation should be given of how the relationships between engineering safety, RAM, EMC/EMI, human factors, testing and commissioning activities will be managed by the Manufacturer. Reference shall be made to the Manufacturer documentation, plans or strategies for managing these activities. The Engineering Safety Management Plan shall include a system software safety plan prepared in accordance with BS EN 50128.

3. **Management** - The arrangements for execution of the processes and methods that deliver system safety. The organisation for implementing the Engineering Safety Management Plan.

Arrangements for delivering Engineering Safety Management Plan within the scope of the Manufacturer's programme are detailed in this section. Processes and methods of working that affect system safety are detailed in this section.

4. **Safety Requirements** – a description of how the system(s) safety requirements (including safety integrity levels (SILs), where appropriate) are to be derived from the Train Technical Specification, standards and other sources, and how and where compliance will be demonstrated.

The Manufacturer is required to prepare a separate Safety Requirements Specification at the start of Train and Equipment Design for Approval by the Purchaser. Alternatively, the Manufacturer may choose, with prior agreement of the Purchaser, to identify safety requirements as part of the overall system requirements traceability strategy and not prepare a separate Safety Requirements Specification.

Include a demonstration of design SILs for safety related functions including, doors, traction runaway, variable parameters errors (for example, TE curve, Regen voltage limit).

5. **Safety Management Principles** – defines the principles, criteria and approach to the risk assessment and ALARP demonstration that the safety management framework is implementing. The tools and techniques to be applied during engineering safety assessment will depend on the complexity of the system(s), the perceived magnitude of the safety risks and whether the Train and Equipment Design is new/novel or bespoke. This section of the Engineering Safety Management Plan shall describe those safety analysis processes the Manufacturer intends to implement with reference to recognised standards or internal procedures. This may include, but is not limited to:

- (a) hazard management
 - (b) hazard identification (e.g. HAZOP, HAZID)
 - (c) interface hazard analysis (e.g. IHA)
 - (d) semi-quantitative risk assessment (e.g. Risk Matrix)
 - (e) quantitative risk assessment (e.g. FMECA, FTA, ETA)
 - (f) engineering safety auditing (internal and external)
6. **Safety Justification Strategy** – description of the proposed content of safety justifications supporting engineering safety assurance and approvals and also describes the processes adopted by the Manufacturer to assure that the safety management activities are implemented effectively. To include:
- (a) component technical case(s) – in situations where it is necessary to seek pre-approval of new/novel or bespoke design equipment;
 - (b) stage gate engineering safety management reports of engineering safety cases; and
 - (c) system engineering safety justification(s) in the form of engineering safety cases – design and final;
 - (d) product safety cases where required to support type approval of products and equipment for use in the operational railway;
 - (e) generic and specific application engineering safety cases for each of the Migration States of the Train;
7. **Yellow Book** - The Engineering Safety Management Plan shall demonstrate compliance with the guidance given in Yellow Book 4 where the scope of supply includes equipment or systems that are safety related or safety critical.
8. **Approval Process** – description of the internal verification, validation and approvals process for the engineering safety deliverables. Explanation shall be given regarding the requirement for, and proposed involvement of, any independent reviewers.
9. **Safety Approval of Modifications** – explanation of how engineering safety implications of design modifications and value engineering are to be assured and approved throughout the delivery of the Works (i.e. control of design changes).
10. **Operation and Maintenance Performance** – summary of the process for analysing operation and maintenance performance to ensure realised safety is compliant with service performance data and operational requirements.
- It is expected that the Manufacturer will run appropriate HAZOPs or similar studies, involving the Purchaser and others, to ensure operational and maintenance issues are adequately addressed.
11. **Control of Safety Interfaces** – identification of, and description of the process for, engineering safety management activities at internal and external interfaces, in particular those interfaces relating to systems integration requirements arising from the operation of Trains on the LUL Network.

The Manufacturer will prepare an IHA to confirm the engineering safety implications at internal and external interfaces have been adequately addressed and managed. The IHA will involve the Purchaser and all relevant interfacing PDPs and third parties.

The IHA will take cognisance of the systems engineering requirements related to the integration of the Trains with other systems on the LUL Network.

12. **Subcontractor Safety Management** – explanation of how the engineering safety management arrangements of Subcontractors will be managed to be compatible with the Engineering Safety Management Plan.

Appendix 2

Hybrid Cooling

1. Introduction

- 1.1 The Purchaser acknowledges that a proven Hybrid Cooling solution suitable for the DTUP does not currently exist, and that further development of the concept is desirable and wishes to fund a Hybrid Cooling Development Project.
- 1.2 If the Hybrid Cooling Development Project demonstrates that the system performance and cost/benefit ratio of the Hybrid Cooling System is favourable then the Purchaser shall have the option pursuant to paragraph 5 below to specify that the Manufacturer implements Hybrid Cooling instead of Conventional Cooling for the DTUP.
- 1.3 The Purchaser acknowledges that Hybrid Cooling will require more space than Conventional Cooling and the Manufacturer will be required to demonstrate the viability of accommodating a Hybrid Cooling System on the Train to the Purchaser prior to commencing the Hybrid Cooling Development Project.

2. Hybrid Cooling - General

- 2.1 During the Concept Design Phase, the Manufacturer shall proactively engage in discussions with the Purchaser to develop a joint understanding of the factors associated with the implementation of Hybrid Cooling.
- 2.2 Within six (6) weeks of the commencement of the Concept Design Phase, the Manufacturer shall provide sufficient information to the Purchaser to enable the Purchaser to form an opinion on the viability of Hybrid Cooling in order for the Purchaser to consider its option to submit a Purchaser Change Notice pursuant to clause 10.6(c). Factors to be considered by the Manufacturer shall specifically include:
 - (a) the physical space for Hybrid Cooling; and
 - (b) how a larger below car saloon cooling unit may impact on other equipment on the Train.
- 2.3 Where any Trains are already in service with Conventional Cooling when the Hybrid Cooling Development Project begins, it is acknowledged by the Parties that any requirement to fit Hybrid Cooling Units to such Trains will require the submission of a Purchaser Change Notice. It is further acknowledged that where a Purchaser Change Notice is not submitted, such Trains will retain Conventional Cooling for the useful life of the cooling system.

3. Hybrid Cooling - Technical Requirements

- 3.1 This paragraph 3 shall apply if the Purchaser exercises its option to require the Manufacturer to progress the Hybrid Cooling Development Project pursuant to clause 10.6(c).
- 3.2 The Manufacturer shall ensure that the design of the Hybrid Cooling System complies with the requirements in this Appendix 2 to schedule 17, as well as all the HVAC requirements described in the Train Technical Requirements. Where there is a conflict between this Appendix 2 and the Train Technical Requirements, the requirements of this Appendix 2 shall prevail.
- 3.3 The Manufacturer shall ensure that, to the greatest extent practicable, a Hybrid Cooling System is capable of being adopted without significant changes to the Trains, including ensuring that the connections to the in-car ductwork and power supply to the saloon

cooling do not require significant modification if and when the Purchaser requires Conventional Cooling to be removed and Hybrid Cooling installed.

3.4 It is acknowledged by the Parties that:

- (a) based on prior studies, the Purchaser considers that ice would be a reasonable candidate phase change medium and that energy storage would be at the evaporator;
- (b) it is not mandated that ice be used, or indeed that the energy storage must be via phase change;
- (c) if a phase change medium other than ice is proposed by the Manufacturer, all flammability, toxicity and corrosivity issues and considerations shall be identified by the Manufacturer and credible mitigation strategies identified and agreed with the Purchaser at the outset of the Concept Design Phase; and
- (d) based on prior studies, the Purchaser anticipates that a Hybrid Cooling below car unit would be up to 500mm longer and 400 kg heavier than a Conventional Cooling below car unit, assuming one unit per car and a car length of approximately 10.5m.

3.5 The Manufacturer shall ensure that:

- (a) the Hybrid Cooling System includes an internal component able to store and discharge thermal energy;
- (b) thermal energy is capable of being stored when residual capacity exists within the vapour compression cycle and where the heat rejection from the vapour compression system would not be undesirable;
- (c) thermal energy shall be capable of being taken (discharged) from the energy store in locations where heat rejection from the vapour compression cycle would be undesirable;
- (d) when the Train is inside a warm tunnel, cooling is preferentially taken from the energy store;
- (e) when the Train is outside of tunnels, cooling is preferentially given to recharging the energy store and/or providing direct cooling;
- (f) at times when the energy store is being discharged, direct cooling is inhibited;
- (g) at times when the energy store is being charged, the Hybrid Cooling System is capable of coincidentally charging the energy store and providing a reduced amount of direct cooling to the saloon;
- (h) the Hybrid Cooling System interfaces with the Train Control and Management System to understand the location of the Train;
- (i) the charge and discharge of the energy store is controlled based on a pre-determined map of locations where the use of the energy in the energy store is preferable;
- (j) it is possible for an authorised person on behalf of the Purchaser to readily adjust the map of designated locations where Hybrid Cooling (charging or discharging) is required;
- (k) the parts of the line/journey preferable for energy store discharge are determined by the Parties based on their assessment of the benefits of minimising heat

rejection in key locations (it is acknowledged that there are potentially sequences of three stations in a row and biased towards the central London stations that are warm and potentially challenging to cool via infrastructure cooling schemes);

- (l) the Hybrid Cooling System senses the overall state of charge of the energy store;
- (m) when the Hybrid Cooling System determines that the energy store is unlikely to be fully discharged during any round trip journey cycle, that use of stored energy occurs for an increased proportion of the tunnelled journey;
- (n) when the Hybrid Cooling System determines that the energy store is likely to be fully discharged during any round trip journey cycle, that the Hybrid Cooling System reverts to direct cooling (although, subject to agreement with the Purchaser, it shall be acceptable for the in-car conditions to occasionally increase above the target temperatures when the Hybrid Cooling Unit is charging the store);
- (o) a saloon upper temperature threshold is assigned with agreement from the Purchaser and if the saloon upper temperature threshold is exceeded during charging, the Hybrid Cooling System reverts to direct cooling until the temperature has reduced to an acceptable level;
- (p) the power demand of the combined heating and Hybrid Cooling System is measured and evaluated;
- (q) during winter, the maximum power demand from a combination of heating the saloon and charging of the store does not exceed the calculated peak heating power demand of the Train, and that if this situation arises store charging is inhibited in preference to heating;
- (r) the Hybrid Cooling System is capable of storing sufficient energy to provide an average of not less than 10.5kW of cooling for a duration of 21 minutes;
- (s) the maximum cooling capacity of the Hybrid Cooling Unit is no more than 15% higher than the maximum cooling capacity of the equivalent Conventional Cooling unit. This cap is to prevent development of solutions which are physically too big to be viable. There shall be no requirement on the Manufacturer to provide the full cooling output of the Conventional Cooling system to the saloon at the same time as charging the energy store;
- (t) the Hybrid Cooling System is capable of providing 8.5 kW of direct cooling to each saloon during the charge process;
- (u) the final cooling capacities dedicated to the saloon and store respectively are reviewed by the Manufacturer during the design process and amended to suit the preferred Hybrid Cooling System configuration;
- (v) the Hybrid Cooling Unit's coefficient of performance during charging of the phase change medium are not less than 2.3 based on the maximum cooling output;
- (w) the heat rejection from the Hybrid Cooling System is minimised during the energy store discharge phase;
- (x) when the Train detects a Stalled Train Event and the Hybrid Cooling System enters stalled mode, the Hybrid Cooling System discharges the energy store until the energy store is depleted;
- (y) the Hybrid Cooling System accounts for the cyclic stresses caused by the operation of Hybrid Cooling every operational hour of every year;

- (z) the Mean Time Between Failures (all failures) for the hybrid saloon HVAC system is not less than 15,000 hours per Hybrid Cooling Unit;
- (aa) the Hybrid Cooling System maximises the availability of cooling to any carriage of the Train in the event of cooling system component failures; and
- (bb) the time before a major overhaul of each Hybrid Cooling Unit is similar to that of Conventional Cooling.

4. **Hybrid Cooling Development Project**

4.1 **General**

- (a) If the Purchaser exercises its option to require the Manufacturer to progress the Hybrid Cooling Development Project pursuant to clause 10.6(c), the Manufacturer shall ensure that the Train and Equipment Design initially made for Conventional Cooling provides additional space to accommodate Hybrid Cooling.
- (b) The Hybrid Cooling Development Project shall operate in parallel to the development of Conventional Cooling.
- (c) The Manufacturer shall allocate separate resources for the Hybrid Development Project so as to not negatively impact the delivery of Conventional Cooling.
- (d) The Hybrid Cooling Development Project shall be managed by the Manufacturer.
- (e) The Development Project shall be broken down into four (4) stages: (i) concept design stage; (ii) prototype testing stage; (iii) final design stage; and (iv) final testing stage (each a "**project stage**").
- (f) Key technical decisions in relation to the Hybrid Cooling Development Project shall be jointly agreed by the Parties.
- (g) The decision relating to the maturity of the Hybrid Cooling Development Project in order to progress to the next project stage shall be a joint decision of the Parties.
- (h) At each project stage of the Hybrid Cooling Development Project the Manufacturer shall provide the Purchaser with a cost estimate for the supply of Hybrid Cooling for the Base Order Fleet and each Fleet for a Whole Line Option. The Manufacturer shall ensure that the cost estimate increases in accuracy as the Hybrid Cooling Development Project progresses and at the end of the project shall represent the final costs for supply. The cost estimate shall be broken down by the Manufacturer into key component costs.
- (i) The price for the Hybrid Cooling Development Project shall be broken down by the Manufacturer into costs for each project stage.
- (j) Payment of the costs for each project stage shall be made by the Purchaser at the agreed completion of each project stage.
- (k) The Purchaser reserves the right to terminate the Hybrid Cooling Development Project at the end of any project stage and for any reason without incurring further costs.
- (l) The Manufacturer shall grant to the Purchaser an irrevocable, perpetual, cost-free and non-exclusive licence (or sub-licence, as applicable) to use the IPR associated with Hybrid Cooling for any future TfL project in the United Kingdom and with any alternative supplier or sub supplier for subsequent fleets or end of life replacement.

- (m) The Manufacturer shall adopt an approach that progressively builds detail and confidence in the concept and system arrangement through each of the project stages.
- (n) Design and progress meetings shall be held during the Hybrid Cooling Development Project. The frequency of the meetings shall be determined between the Parties but shall be at least monthly.
- (o) The Manufacturer shall, at a workshop at the end of each project stage, present information and the Parties shall discuss issues and progress.
- (p) The Manufacturer shall host Hybrid Cooling Development Project workshops and meetings if it is agreed by all Parties that there would be benefits in adopting such a location. Otherwise, workshops and review meetings shall be held at the Purchaser's offices in London.
- (q) The Manufacturer shall develop and maintain logs identifying Hybrid Cooling Development Project risks, opportunities, assumptions and hazards.
- (r) The Manufacturer shall develop a detailed schedule for the Hybrid Cooling Development Project and manage the delivery of the works against that schedule.
- (s) The Manufacturer shall report to the Purchaser on the progress of the Hybrid Cooling Development Project and produce a monthly summary report which shall be sent to the Purchaser.
- (t) The Manufacturer shall develop and manage a comments and issues log throughout the Hybrid Cooling Development Project. Comments and issues shall be graded in terms of severity and the log shall be used to inform the decision of the Parties to progress between project stages.

4.2 **Concept Design Stage**

- (a) The Purchaser shall make available to the Purchaser any commercially non-sensitive information related to its initial investigations into Hybrid Cooling. The Manufacturer may adopt prior information and learning for the Hybrid Cooling Development Project, at its own risk.
- (b) The concept design stage shall be developed in not less than three interim submission stages.
- (c) The overall duration of the concept design stage shall not exceed nine (9) consecutive calendar months.
- (d) At the completion of the concept design stage, the Manufacturer shall ensure that the design provides confidence in Hybrid Cooling in relation to physical size, weight, fabrication methods, theoretical thermal performance, method of control, different operating modes, method of managing thermal expansion, electrical requirements, integration with Conventional Cooling ductwork and theoretical reliability and availability, maintainability and safety.
- (e) The Manufacturer shall submit calculations, models, reports and drawings to the Purchaser describing the concept design and the works undertaken.
- (f) The Manufacturer shall perform and submit detailed heat transfer and thermodynamic calculations to support the development of the concept design of the Hybrid Cooling System. These shall include, but not be limited to:

- (i) calculations to verify the air-side and refrigerant side heat transfer at the energy store and at any Conventional Cooling coils;
 - (ii) calculations to verify the phase changing rates for foreseeable operating cycles;
 - (iii) refrigeration cycle thermal performance calculations;
 - (iv) coefficient of performance calculations;
 - (v) calculations to predict and manage the thermal expansion;
 - (vi) calculations to predict the in-car conditions when the system is in use; and
 - (vii) calculations to determine the extent of phase change medium available at each stage of representative Piccadilly line journeys under a range of plausible usage scenarios.
- (g) The Manufacturer shall perform and submit detailed structural calculations to support the development of the concept design. These calculations shall include, but not be limited to, calculations to determine materials, support selections and thicknesses and that demonstrate the acceptability of the materials used in the Hybrid Cooling Unit under static and dynamic fatigue loading.
 - (h) The Manufacturer shall perform and submit detailed airflow calculations to determine the airflows within the Hybrid Cooling Unit and shall use computational fluid dynamics as a tool to assist in the optimisation of internal airflows.
 - (i) The Manufacturer shall develop detailed calculations to predict the reliability, availability, maintenance approach and maintenance costs associated with Hybrid Cooling.
 - (j) The Manufacturer shall undertake safety analyses commensurate with that developed for Conventional Cooling and shall include hazard identification workshops and risk reviews to identify mitigations and safety requirements to manage any risks to as low as reasonably practicable.
 - (k) The Manufacturer shall provide simplified relationships that allow the saloon cooling and heating loads and Hybrid Cooling System coefficient of performance to be estimated based on external conditions and passenger loading.
 - (l) The Purchaser will provide to the Manufacturer calculation models advising of the run times, passenger loading and frequency of occurrence of ambient conditions. The Manufacturer's thermal demand and coefficient of performance data will be inputted into this model to allow determination by the Purchaser of the preferred operating modes.
 - (m) The Parties shall jointly determine an optimum operating profile for the Hybrid Cooling Development Project.
 - (n) The Manufacturer shall develop a control concept that allows flexibility and efficiency in the use of the Hybrid Cooling System.
 - (o) The Manufacturer shall submit dimensioned drawings showing the weight and size of the concept design.
 - (p) The Manufacturer shall develop interface requirements with the Train and Train systems.

- (q) The Manufacturer shall provide to the Purchaser Equipment selection details and technical literature for key components including cooling coils, compressors, evaporator fans and condenser fans.
- (r) Detailed requirements for prototype testing shall be identified and agreed between the Parties during the concept design stage in accordance with the minimum requirements set out in paragraph 4.3 below.

4.3 **Prototype Testing Stage**

- (a) The overall duration of the prototype testing stage shall not exceed 15 consecutive calendar months.
- (b) The prototype testing stage shall be used to reduce key uncertainties to a level sufficient to allow final design to be able to take place.
- (c) At the completion of the prototype testing stage the Manufacturer shall ensure that the steady state and transient thermal performance is understood to an accuracy of not greater than +/-10%.
- (d) At least two (2) weeks prior to any testing the Manufacturer shall have developed and gained Approval by the Purchaser to testing plans that identify the objectives of the tests, test procedure, test location, measurement methods and instrumentation, required measurement accuracy, pass/fail criterion, actions on pass/fail, test durations and test locations.
- (e) The Purchaser shall have the right to attend or not attend any test or group of tests.
- (f) Items requiring re-testing or subsequent additional testing shall be undertaken by the Manufacturer at no additional cost to the Purchaser.
- (g) The prototype testing shall include tests of the phase change medium heat exchanger, including:
 - (i) tests to verify the rate of phase change in a static and dynamic environment;
 - (ii) tests to determine the pattern of solidification of the phase change medium within the heat exchanger and methods to optimise this to avoid uneven solidification and localised stresses;
 - (iii) tests to determine the method of sensing the extent of solidification or melting;
 - (iv) tests to optimise the refrigerant pipe arrangements associated with the heat exchanger;
 - (v) tests to determine the pressures and stresses within any heat exchanger;
 - (vi) tests to determine the strain within the materials; and
 - (vii) tests to determine the air side heat transfer and tests to determine the air-side airflow resistance.
- (h) The prototype testing shall include tests of the heat exchanger integrated into the overall saloon cooling unit. These tests shall be used to verify:
 - (i) the overall integrated operation and control of the unit;

- (ii) the cooling output in Conventional Cooling and Hybrid Cooling modes;
 - (iii) the electrical power consumption;
 - (iv) interface considerations and issues;
 - (v) design integration; and
 - (vi) methods of managing condensate and airflows and air resistance.
- (i) The Manufacturer shall produce reports describing the tests, lessons learned and key requirements and design modifications that were found to be necessary or are recommended by the Manufacturer for any subsequent project stage.

4.4 **Final Design Stage**

- (a) The final design shall develop the Hybrid Cooling Unit to a state where it is considered fit for manufacture, installation and delivery into service for on-Train testing on the LUL Network.
- (b) The duration of the final design stage shall not exceed six (6) consecutive calendar months.
- (c) The final design of the Hybrid Cooling System shall include development of designs for any required modifications or improvements to the Train to accommodate Hybrid Cooling.
- (d) The final design stage shall include the development of the plans and requirements for the final testing stages.
- (e) Detailed requirements for final testing shall be identified and agreed by the Parties during the final design stage in accordance with the minimum requirements for final testing set out in paragraph 4.5 below.

4.5 **Final Testing Stage**

- (a) Pre-production versions of the Hybrid Cooling Unit shall be developed by the Manufacturer prior to final testing.
- (b) At least six (6) weeks prior to any final testing, the Manufacturer shall have developed and gained the Purchaser's Approval to testing plans that identify the objectives of the tests, test procedure, test location, measurement methods and instrumentation, required measurement accuracy, pass/fail criterion, actions on pass/fail, test durations and test locations.
- (c) A final Hybrid Cooling Unit shall be subject to the same Type Tests as specified in schedule 7 (Testing and Inspection) of this Agreement for Conventional Cooling.
- (d) Final Hybrid Cooling Units shall be fitted to a Base Order Train (the "**Test Train**") for integrated testing on the LUL Network.
- (e) The final Hybrid Cooling Units and Test Train shall be subject to inspections and integration tests prior to use on the LUL Network, which shall be based on those specified and delivered for Conventional Cooling and shall be carried out to verify that the Hybrid Cooling System is safe for use.
- (f) The timetable of the final testing shall be agreed by the Parties prior to progressing, taking account of the prevailing situation around the development and delivery of the early series Trains in the Base Order Fleet.

- (g) At least three Hybrid Cooling Units shall be fitted to four (4) cars at the end of the Test Train. Conventional Cooling units shall be fitted to the remainder of the Test Train.
 - (h) The performance of Hybrid Cooling shall be compared to the design parameters and specifications and also to those of Conventional Cooling at the opposite end of the Test Train.
 - (i) The final testing shall include periods of running in tunnel and outside of tunnel and include a continuous period between May and September.
 - (j) The final testing shall verify the in-car thermal conditions; electrical energy usage; reliability, failure rates and corrective actions; stability of automatic control and transient performance of the system. The usage of the Test Train and Test Train exterior thermal environmental conditions shall also be observed.
 - (k) A template for final testing results shall be agreed by the Parties prior to the tests.
 - (l) The Manufacturer shall collect and process data at least every two (2) weeks during the tests and report updates issued not more than one week after the collection of data.
 - (m) The Parties shall meet at not less than two (2) week intervals during the final testing to review the results and discuss and agree any potential modifications to improve performance.
 - (n) The Manufacturer shall make agreed modifications to the Hybrid Cooling Units and the Test Train during the final testing stage.
 - (o) At the end of the final testing stage, the Manufacturer shall deliver a comprehensive final testing report to the Purchaser.
 - (p) At the end of the final testing stage, the Manufacturer shall modify the design to account for any changes that are agreed to improve the performance of the Hybrid Cooling Unit.
5. Once the final testing stage has been completed, the Purchaser shall be entitled to issue a Purchaser Change Notice to require the Manufacturer to fit Hybrid Cooling Units to the Trains in accordance with the terms set out in such Purchaser Change Notice and schedule 12 (Change Procedure) shall apply, and if the Purchaser issues a Purchaser Change Notice, the Manufacturer shall not be entitled to deliver an Initial Change Appraisal pursuant to paragraph 3.1 of Part B: of schedule 12 (Change Procedure) which includes an opinion in the terms set out in paragraph 2.1(a) of Part B: of schedule 12.

SCHEDULE 18**Manufacturer Confidential Information**

	Column 1 Manufacturer Confidential Information	Column 2 For period ending on date
1.	Price breakdowns, including any financial models and supporting documents relating to this Agreement to the extent this reveals information about the Manufacturer's, any Key Subcontractors' or any of their Affiliates' costs, rates, build ups, forecasts and/or profit levels, but excluding Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) and Appendix 3 to schedule 25 (Whole Line Options).	Duration of the Agreement
2.	Information obtained from the Manufacturer relating to risks and pricing of the same to the extent this reveals information about the Manufacturer's, any Key Subcontractors' or any of their or Affiliates' costs, rates, build ups, forecasts and/or profit levels.	Duration of the Agreement
3.	Personal information relating to any of the Manufacturer's employees or employees of any Subcontractors to the extent it contains information exempt as personal data under section 40 of the Freedom of Information Act 2000 but without prejudice to the rights of access under the DPA.	Duration of the Agreement
4.	Manufacturer IPR referred to in Schedule 2 (Manufacturer Train Proposal).	Unlimited

SCHEDULE 19

Dispute Resolution Procedure

1. Disputes

Any Dispute shall be resolved in accordance with this schedule 19.

2. Senior Representatives

- 2.1 Each of the Parties shall use reasonable endeavours to negotiate in good faith to settle any Dispute before taking any further action.
- 2.2 Subject to paragraph 2.1, paragraph 3 (Expert Determination) and paragraph 4 (Adjudication), either Party shall refer a Dispute, by notice in writing to the other Party, to a managerial representative of each Party (together, the **"Senior Representatives"**) who shall meet and endeavour to resolve the Dispute between them. The joint written decision of the Senior Representatives shall be binding upon the Parties.
- 2.3 If the Senior Representatives are unable to resolve the Dispute within 14 days of the meeting referred to in paragraph 2.2, either Party may escalate the Dispute as follows:
 - (a) if the Dispute is an Expert Dispute, in accordance with paragraph 3 (Expert Determination) of this schedule 19; or
 - (b) if the Dispute is not an Expert Dispute, in accordance with paragraph 4 (Adjudication) of this schedule 19.

3. Expert Determination

- 3.1 Subject to paragraph 2 (Senior Representatives), if a Dispute is an Expert Dispute, either Party may give written notice to the other Party of its intention to refer the Dispute to expert determination in accordance with this paragraph 3. Such notice shall set out with adequate specificity the issue or issues to be investigated and resolved by the Expert appointed pursuant to paragraph 3.2 below (the **"Notice of Dispute"**).
- 3.2 The Parties shall use reasonable endeavours to agree upon an expert. If such agreement is not reached within eight (8) days of receipt of the Notice of Dispute (or within such further time as the Parties may agree), either Party may apply to the London Court of International Arbitration (**"LCIA"**) to appoint an expert, such appointment to be effected as quickly as possible and in any event within six (6) days of the application to the LCIA (such expert agreed by the Parties or appointed by the LCIA being the **"Expert"**).
- 3.3 Where the Expert has been appointed by the LCIA, the Parties shall, in the absence of direct agreement with the Expert, refer the terms of the remuneration of the Expert to the LCIA to be settled and binding upon the Parties by agreement between the LCIA and the Expert (provided that the level of the Expert's fees shall not exceed the level originally proposed to the Parties by the Expert following his appointment by the LCIA).
- 3.4 Forthwith upon the agreement or determination of the Expert's terms of appointment and remuneration between the Expert and the Parties, the Expert shall confirm his acceptance of the appointment (the **"Notice of Appointment"**).
- 3.5 Within seven (7) days of receipt of the Notice of Appointment, the referring Party shall serve on the Expert and the other Party a written submission which sets out the nature of its case and appends the supporting documentation which it considers relevant to the Expert Dispute. The submission shall, at a minimum:

- (a) set out with adequate specificity the issue or issues to be investigated and resolved by the Expert;
 - (b) be accompanied by any correspondence between the Parties that discusses the issues and the Parties' attempts to resolve them; and
 - (c) be accompanied by any relevant contractual documents, specifications and/or any technical documents or other data relevant to an initial understanding of the issue.
- 3.6 The other Party may, within seven (7) days of receipt of a submission pursuant to paragraph 3.5, serve on the Expert and the referring Party a submission in reply setting out its response to the referring Party's submission, clarifying or adding to the issues to be investigated and appending any additional supporting documentation upon which it wishes to rely.
- 3.7 The role of the Expert shall be to investigate using his professional skill and experience the issues raised by the Dispute and to determine for himself the correct answer to any disagreement or issue that is required to be resolved between the Parties to the Expert Dispute. The Expert shall not act in a judicial or quasi-judicial capacity, but instead will act on his own behalf and seek to determine on a wholly independent and objective basis his view of the correct answer or solution to any issues raised by the Parties. The Expert shall act as an expert and not as an arbitrator or adjudicator and the provisions of the Arbitration Act 1996 and the law relating to arbitration shall not apply to the Expert, his decision or the procedure by which he reached his decision.
- 3.8 The Parties agree and acknowledge that they shall act reasonably and co-operate promptly with the Expert, and shall provide (or, where applicable, shall use reasonable endeavours to procure that others provide) the Expert with such assistance and documentation as the Expert reasonably requires for the purpose of reaching his decision.
- 3.9 The Expert shall make his determination as expeditiously as reasonably practicable and in any event within 28 days of service of the Notice of Appointment or such other time as may be agreed between the Parties. The Expert shall provide, at the same time as his determination, a written set of conclusions including reasons for such conclusions, to the Parties.
- 3.10 Subject to paragraph 5.1(a), the Expert's determination shall be final and binding upon the Parties save in respect of:
- (a) error on a point of law which any Party reasonably believes materially affects the Expert's determination;
 - (b) fraud;
 - (c) manifest error; or
 - (d) matters outside the Expert's jurisdiction.

For the avoidance of doubt, the Parties may only challenge the Expert's determination on the basis of the grounds set out in this paragraph 3.10.

- 3.11 Subject to paragraph 3.12:
- (a) where the Expert has been appointed by the LCIA, the appointment fee of the LCIA shall be shared equally between the Parties, and if one Party pays the whole of the fee, the other Party shall pay its share of the fee upon demand; and
 - (b) the Expert's fees and any costs reasonably and properly incurred by him in arriving at his determination shall be shared between the Parties.

3.12 The Expert may direct that any legal costs and expenses incurred by a Party in respect of the determination and/or Expert Dispute shall be paid by the other Party to the determination and/or Expert Dispute on the general principle that costs should follow the event, except where it appears to the Expert that, in the circumstances, this is not appropriate in relation to the whole or part of such costs.

3.13 All matters concerning the process and result of the determination by the Expert, including but not limited to any documentation provided by the relevant Parties, to the extent that they are not otherwise in the public domain, shall be treated as confidential.

4. **Adjudication**

4.1 Save where a dispute is an Expert Dispute, and subject to paragraph 2 (Senior Representatives), either Party may at any time give the other notice of intention to refer the Dispute to adjudication in accordance with this paragraph 4.

4.2 When giving its notice of intention to refer the Dispute, the referring Party will nominate an adjudicator who must be approved by the non-referring Party. If such approval is not obtained within four (4) days, either Party shall have the right to apply to the Technology and Construction Bar Association (TECBAR) (or, in the event that TECBAR ceases to exist, by another nominating body agreed between the Parties within the four (4) day period), directing it to nominate an independent adjudicator within three (3) days.

4.3 Once appointed pursuant to paragraph 4.2, such adjudicator shall be the "**Adjudicator**" for the purposes of this Agreement and the Dispute shall be deemed to have been referred to the Adjudicator for the purposes of this paragraph 4.

4.4 The Party referring the Dispute to the Adjudicator shall, within seven (7) days of the appointment of the Adjudicator, provide its submission upon the Dispute to be considered by the Adjudicator with a copy by letter to the other Party. Any submission from the other Party to be considered by the Adjudicator shall be provided within seven (7) days from the first submission. The Parties shall comply with any request of the Adjudicator in relation to the Dispute.

4.5 Any communication between either Party and the Adjudicator shall be communicated contemporaneously also to the other Party.

4.6 In any event, the Adjudicator shall provide to both Parties his written decision on the Dispute within 28 days of the reference (or such longer period as the Parties may agree after the reference). The Adjudicator shall have the power to extend the period of 28 days by up to 14 days, with the consent of the Party which referred the Dispute. Unless the Parties otherwise agree, the Adjudicator shall give reasons for his decision. Unless and until the Dispute is finally determined by the Courts in accordance with paragraph 5 or by the agreement of the Parties, the Adjudicator's decision shall be binding on both Parties who shall forthwith give effect to the decision. The Adjudicator shall have the power to correct his decision so as to remove a clerical or typographical error arising by accident or omission.

4.7 The Adjudicator's costs of any reference shall be borne as the Adjudicator shall specify or, in default, equally by the Parties. The Parties may agree to allocate their own costs arising out of the reference, including legal costs and the costs and expenses of any witnesses.

4.8 The Adjudicator shall be deemed not to be an arbitrator but shall render his decision as an expert, and the provisions of the Arbitration Act 1996 and the law relating to arbitration shall not apply to the Adjudicator or his determination or the procedure by which he reached his determination.

4.9 The Adjudicator shall act impartially and may take the initiative in ascertaining the facts and the law. The Adjudicator shall have the power to open up, review and revise any

opinion, certificate, instruction, determination or decision of whatever nature given or made under this Agreement.

- 4.10 All information, data or documentation disclosed or delivered by a Party to the Adjudicator in consequence of or in connection with his appointment as Adjudicator shall be treated as confidential. The Adjudicator shall not, save as permitted by clause 38 (Confidentiality), disclose to any person or company any such information, data or documentation and all such information, data or documentation shall remain the property of the Party disclosing or delivering the same and all copies shall be returned to such Party on completion of the Adjudicator's work.
- 4.11 The Adjudicator is not liable for anything done or omitted in the discharge or purported discharge of his functions as Adjudicator unless the act or omission is in bad faith. Any employee or agent of the Adjudicator is similarly protected from liability.

5. **Reference to Court**

5.1 If:

- (a) one of the Parties is dissatisfied with the Expert's determination solely on the basis of any of the grounds set out in paragraph 3.10;
- (b) one of the Parties is dissatisfied with the decision after the Adjudicator notifies his decision; or
- (c) the Adjudicator has not notified his decision and the time provided by paragraph 4.6 has expired,

then either Party may:

- (i) within 35 days of receipt of the Expert's or Adjudicator's decision (as appropriate); or
- (ii) where the Adjudicator has not notified his decision and the time period set out in paragraph 4.6 has expired,

where appropriate, notify the other Party of its intention to refer the Dispute to the Courts of England and Wales (the "**Courts**") for final determination.

- 5.2 For the avoidance of doubt, if a Party fails to so notify the other Party pursuant to paragraph 5.1, it will be taken to have waived its right to refer the matter to the Courts and the determination of the Expert or decision of the Adjudicator will be final and binding. Otherwise, the Courts shall have the power to open up, review and revise any opinion, certificate, instruction, determination or decision of whatever nature given or made under this Agreement, to vary or cancel the decision of the Adjudicator and, where appropriate, to order financial compensation to be paid by one Party to the other.

6. **Continuing Obligations and Rights**

- 6.1 Unless this Agreement has already been repudiated or terminated, the Parties shall continue to comply with, observe and perform all of their obligations under this Agreement regardless of the nature of the dispute and notwithstanding the referral of the Dispute for resolution under this schedule 19 and shall give effect forthwith to every determination of the Expert or decision of the Adjudicator and the Courts delivered under this schedule 19. The provisions of this schedule 19 shall continue to apply to any Dispute notwithstanding the repudiation or termination of this Agreement.
- 6.2 No Party shall be prevented from, or delayed in, seeking any order for specific performance or for interim or final injunctive relief or for other equitable relief as a result

of the provisions of this schedule 19, nor shall this schedule 19 apply in respect of any circumstances where such remedies are sought.

SCHEDULE 20

Termination Payments

1. **Termination for Manufacturer Default, Safety Breach or Prohibited Act prior to Acceptance of the Fleet**

If this Agreement is terminated prior to Acceptance of all of the Trains and all of the Equipment relating to the Base Order and any Whole Line Options that have been exercised, as a result of:

- (a) the occurrence of a Manufacturer Event of Default in accordance with clause 30 in (Manufacturer Default); or
- (b) the occurrence of a Prohibited Act or Safety Breach in accordance with clause 34 (Prohibited Act and Safety Breach Termination),

the Purchaser shall, without prejudice to paragraph 2 (Termination Indemnity), be entitled (in its absolute discretion) to:

- (i) procure the completion by the Manufacturer or a third party of all partially complete Trains and/or other items of Equipment (including any Base Order Spares for the forthcoming 12 month period which the Manufacturer is obliged to provide to the Purchaser in accordance with clause 7.15) relating to the relevant Fleet such that they have satisfied the conditions necessary for the passing of title to the Purchaser and, upon Acceptance of all such Trains and Equipment and the passing of title to the Purchaser on the basis of clause 18.1, pay to the Manufacturer the relevant Milestone Payments for each such Train or other item of Equipment that are due but not yet paid as at the Termination Date, less (where the Purchaser has procured the completion by a third party), the cost of completion and the costs of the Purchaser's procurement of the same. Subject to clauses 37.5 and 37.6, where this gives rise to a negative figure, the corresponding positive amount will be paid by the Manufacturer to the Purchaser together with Default Interest (calculated from the Termination Date to the date of payment by the Manufacturer); or
- (ii) require the Manufacturer to reimburse the Purchaser (in which case the Manufacturer shall pay the Purchaser) in respect of all amounts paid to the Manufacturer in relation to the supply of Trains and Equipment in the relevant Fleet (other than in respect of Trains and Equipment where title has transferred to the Purchaser pursuant to clause 18 (Transfer of Title and Risk)). The amount to be reimbursed by the Manufacturer shall attract Default Interest (calculated from the date of the relevant payment by the Purchaser until the date on which such repayment is made).

2. **Termination Indemnity**

Subject to clauses 37.5 and 37.6, if this Agreement is terminated or Partially Terminated (i) prior to Acceptance of all of the Trains and all of the Equipment relating to the Base Order and any Whole Line Options that have been exercised, or (ii) after Acceptance of all of the Trains and Equipment in a Fleet, as a result of:

- (a) the occurrence of a Manufacturer Event of Default in accordance with clause 30 (Manufacturer Default);
- (b) the occurrence of a Prohibited Act or Safety Breach in accordance with clause 34 (Prohibited Act and Safety Breach Termination); or

(c) a Manufacturer Serious Infringement as referred to in clause 33.4(b)(i),

the Manufacturer shall, in addition to any amounts payable pursuant to paragraph 1 (Termination for Manufacturer Default, Safety Breach or Prohibited Act prior to Acceptance of the Fleet) above, be responsible for and release and indemnify the Indemnified Parties on demand on an after-Tax basis from and against all liability for the costs, losses and expenses suffered or incurred by the Indemnified Parties arising from the termination or Partial Termination of this Agreement including, but not limited to:

- (i) the costs of procuring a replacement contract and any associated contracts including any increase in the price of the replacement contract and all project management, legal and other professional costs and fees in relation to such replacement contract;
- (ii) all other reasonable direct losses, costs and claims of the Indemnified Parties (including but without limitation, project management, legal and other professional costs and fees);
- (iii) costs of redundancy and other demobilisation costs necessary as a result of the Purchaser operating a smaller Fleet (if appropriate);
- (iv) the costs of retraining, re-diagramming and retendering and losses and costs incurred as a result of the Purchaser operating a smaller Fleet (if appropriate);
- (v) the costs of the Purchaser procuring temporary replacement and/or cascaded Trains and Equipment (including the replenishment of Base Order Spares (and WLO Spares where any Whole Line Option has been exercised) in accordance with clause 7.15 for the Train Warranty Period and the period of 12 months following the end of the Train Warranty Period);
- (vi) the cost of satisfying any outstanding Pre-Provisional Preconditions or Preconditions relating to any Trains or Equipment (in the relevant Fleet) retained by or transferred to the Purchaser in accordance with paragraph 1; and
- (vii) an amount equal to the liquidated damages payable by the Manufacturer pursuant to clause 16 (if any) as a result of applying the tests set out in clause 16.5 on or around the date of termination (rather than on Fleet Acceptance), as such tests are adjusted to take into account of the size of the relevant Fleet at the time of termination (with any Acquired WIP).

3. **Consequences of Voluntary Termination or Termination for Purchaser Default / Force Majeure / Utilities Contracts Regulation**

3.1 If this Agreement is terminated or Partially Terminated prior to Acceptance of all of the Trains and all of the Equipment relating to the Base Order and any Whole Line Options that have been exercised, as a result of:

- (a) the occurrence of a Purchaser Event of Default in accordance with clause 31 (Purchaser Default);
- (b) Purchaser voluntary termination in accordance with clause 36.1;
- (c) a continuing Force Majeure Event in accordance with clause 32;
- (d) an order of a court of competent jurisdiction that there has been a Substantial Modification as referred to in clause 33.4(a); or

(e) a Purchaser Serious Infringement as referred to in clause 33.4(b)(ii),

then:

- (i) the Purchaser shall pay to the Manufacturer the fair value in respect of each partially completed Train or other item of Equipment in respect of those Fleets that have been terminated (the "**Acquired WIP**"), (which in respect of any Train or other item of Equipment which is not complete and ready for delivery as specified in clause 15 (Acceptance of Trains and Equipment) shall be less than the Contract Price for such Train or items of Equipment) LESS the amount of Milestone Payments made in respect of such Acquired WIP. Where this gives rise to a negative figure, the corresponding positive amount shall be paid by the Manufacturer to the Purchaser; and
- (ii) the Manufacturer shall pay to the Purchaser an amount equal to the liquidated damages payable by the Manufacturer pursuant to clause 16 (if any) as a result of applying the tests set out in clause 16.5 on or around the date of termination (rather than on Fleet Acceptance), as such tests are adjusted to take into account of the size of the relevant Fleet or Fleets at the time of termination (with any Acquired WIP).

3.2 The Purchaser may, at its own option, elect whether or not to acquire and take title to any partially completed Trains and/or other items of Equipment in respect of those Fleets that have been terminated.

3.3 Where the Purchaser elects not to acquire and take title to any partially completed Trains or other items of Equipment pursuant to paragraph 3.2, the Manufacturer shall use reasonable endeavours to dispose of such Purchased Items for a reasonable market rate and shall account to the Purchaser for the proceeds of any subsequent disposal (whether for scrap or otherwise) of any such Trains or items of Equipment or subsequently completed Trains or items of Equipment after deducting its reasonable costs and expenses in completing the Trains or items of Equipment and in effecting disposal.

3.4 If this Agreement is terminated or Partially Terminated prior to Acceptance of all of the Trains and all of the Equipment relating to the Base Order and any Whole Line Options that have been exercised, as a result of:

- (a) a Purchaser Event of Default in accordance with clause 31 (Purchaser Default);
- (b) Purchaser voluntary termination in accordance with clause 36.1; or
- (c) a Purchaser Serious Infringement as referred to in clause 33.4(b)(ii),

then in addition to the amounts payable pursuant to paragraph 3.1, the Purchaser shall (on having received from the Manufacturer evidence to substantiate any such claim acceptable to the Purchaser) pay the costs, expenses and other liabilities reasonably, properly, wholly and necessarily incurred by the Manufacturer as a direct result of the termination of this Agreement, but excluding loss of profit or any other type of indirect, consequential, economic or special loss or damage suffered by the Manufacturer, provided that the Manufacturer shall use all reasonable endeavours to mitigate such costs, expenses and/or other liabilities.

3.5 In assessing the losses in paragraph 3.4 that are incurred by the Manufacturer as a direct result of the termination of this Agreement, the Manufacturer shall not be entitled to take into account any prospective contracts or liabilities that may or would have been incurred if one or more Whole Line Options had been exercised by the Purchaser by the date of termination but nevertheless had not been exercised by that date.

4. **Ineffectiveness**

- 4.1 If this Agreement is terminated pursuant to clause 33.3 (Declaration of Ineffectiveness), the Purchaser shall pay to the Manufacturer such sum as represents the cost of labour and materials reasonably and properly incurred or committed on arm's length terms by the Manufacturer as at the Termination Date relating to the provision of the Works.
- 4.2 In assessing the costs incurred or committed in paragraph 4.1, the Manufacturer shall not be entitled to take into account any prospective contracts or liabilities that may or would have been incurred if one or more Whole Line Options had been exercised by the Purchaser by the date of termination but nevertheless had not been exercised by that date.

5. **Timing of Payment**

- 5.1 Any amounts payable by either Party pursuant to this schedule 20 shall be paid to the recipient Party in a lump sum (together with interest thereon calculated in accordance with paragraph 5.2 on or before the date falling 60 Working Days after the date on which the Party provides to the other Party a written invoice detailing all amounts due and payable to that Party).
- 5.2 Any amounts payable by either Party pursuant to this schedule 20 shall carry Default Interest from the Termination Date to the date of payment by the relevant Party on the basis set out in clause 25.3.

6. **General**

- 6.1 Without prejudice to paragraphs 2(c)(vii) and 3.1(e)(ii), the costs and/or expenses to be taken into account in the calculation of all termination sums due pursuant to this schedule 20 shall only be such costs and/or expenses to the extent that they are reasonable and proper in quantum and shall have been or will be reasonably and properly incurred.
- 6.2 The Parties shall each use all reasonable endeavours to mitigate all costs and expenses and other sums claims as part of any termination sums due pursuant to this schedule 20.
- 6.3 Subject to paragraphs 6.5 to 6.9, the amount of any compensation paid pursuant to this schedule 20 including the identification and calculation of each element comprised in or to be deducted from it, the ascertainment of any amount or matter requiring to be estimated or anticipated and (where so required by the provisions of this schedule 20) the reasonableness of any amount or matter shall be as agreed between the Parties or, if they are unable to agree within a period which is reasonable in the light of the amounts and matters requiring to be so identified, ascertained or calculated, as referred to and determined in accordance with the Dispute Resolution Procedure.
- 6.4 Payment of compensation in accordance with this schedule 20 shall be in full and final settlement of any claims and rights of the Manufacturer against the Purchaser for breaches and/or termination of this Agreement (whether under contract, tort, restitution or otherwise) save for any antecedent liability of the Purchaser which arose prior to the date of termination (but not from the termination itself) to the extent that such liability has not already been taken into account in the calculation of the compensation payable under this Agreement. The compensation payable under this schedule 20 shall be the sole remedy of the Manufacturer against the Purchaser on termination of this Agreement (in relation to the relevant Fleet or Fleets) and the Manufacturer hereby waives any other right or redress it may have against the Purchaser arising from such termination.
- 6.5 The Purchaser shall be entitled to appoint a suitably qualified independent person ("**Independent Auditor**") to audit any or all of the costs, expenses and/or other liabilities incurred by the Manufacturer as a direct result of termination of this Agreement which the Manufacturer is claiming from the Purchaser pursuant to this schedule 20 and to

determine whether the amount of such costs, expenses and/or liabilities were properly and reasonably incurred by the Manufacturer as a direct result of the termination of this Agreement (in relation to the relevant Fleet or Fleets).

- 6.6 Where the Purchaser exercises its rights pursuant to paragraph 6.5 it shall give written notice to the Manufacturer identifying the Independent Auditor appointed by the Purchaser, the terms of the Independent Auditor's appointment and the proposed timeframes for undertaking the audit. The Manufacturer shall co-operate with the Independent Auditor and grant the Independent Auditor the same rights of audit as the Purchaser enjoys under this Agreement.

- 6.7 The Purchaser shall procure that the Independent Auditor provides a copy of its decision in writing (together with reasons for its decision) to the Manufacturer at the same time as the decision is provided to the Purchaser. Where the Independent Auditor determines that some or all of a specific cost, expense and/or liability was not properly and reasonably incurred by the Manufacturer as a direct result of termination of this Agreement, the Purchaser shall not be obliged to pay such amount to the Manufacturer.

- 6.8 The costs incurred by the Independent Auditor in undertaking the audit shall be borne by the Purchaser save where the Independent Auditor determines that some or all of a specific cost, expense and/or liability was not properly and reasonably incurred by the Manufacturer, in which case the costs incurred by the Independent Auditor in undertaking the audit shall be borne by the Manufacturer.

- 6.9 If the Manufacturer disputes any findings of the Independent Auditor such Dispute shall be referred for resolution in accordance with the Dispute Resolution Procedure.

- 6.10 References in this schedule 20 to "prior to Acceptance of all of the Trains and all of the Equipment" shall, in relation to any period prior to Equipment being Accepted, include references to any period prior to delivery of any Further Equipment with a Certificate of Conformance.

SCHEDULE 21

Pro Forma Certificates

Part A: Pro forma Certificates

FORM OF PRE-PROVISIONAL ACCEPTANCE CERTIFICATE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [.....] and made between London Underground Limited and [.....] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Pre-Provisional Acceptance Certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Pre-Provisional Acceptance Certificate.
2. This certificate constitutes a Pre-Provisional Acceptance Certificate under the MSA.
3. We, London Underground Limited, hereby confirm that subject to clause 15.25 of the MSA, the *[details of Train(s) receiving a Pre-Provisional Acceptance Certificate]* *[comply/complies]* with each of the Pre-Provisional Acceptance Criteria.

Signed for and on behalf of **London Underground Limited**

Signature.....

Name.....

Position.....

Date.....

FORM OF QUALIFIED PRE-PROVISIONAL ACCEPTANCE CERTIFICATE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [.....] and made between London Underground Limited and [.....] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Qualified Pre-Provisional Acceptance Certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Qualified Pre-Provisional Acceptance Certificate.
2. This certificate constitutes a Qualified Pre-Provisional Acceptance Certificate under the MSA.
3. We, London Underground Limited, hereby confirm that subject to clause 15.25 of the MSA, the *[details of Train(s) receiving a Qualified Pre-Provisional Acceptance Certificate]* *[comply/complies]* with each of the Pre-Provisional Acceptance Criteria subject to the following Pre-Provisional Preconditions listed in the table below which the Manufacturer is required to satisfy in accordance with the Pre-Provisional Preconditions Timetable:

	Pre-Provisional Preconditions	Pre-Provisional Preconditions Timetable
1.		
2.		

4. The issue by the Purchaser of this Qualified Pre-Provisional Acceptance Certificate for *[details of Train(s) receiving a QPPAC]* does not imply that a Qualified Pre-Provisional Acceptance Certificate will be issued by London Underground Limited for any other Train (and clause 15.3A of the MSA continues to apply).

Signed for and on behalf of **London Underground Limited**

Signature:

Name:

Position:

Date:

FORM OF QUALIFIED PROVISIONAL ACCEPTANCE CERTIFICATE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [.....] and made between London Underground Limited and [.....] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Qualified Provisional Acceptance Certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Qualified Provisional Acceptance Certificate.
2. This certificate constitutes a Qualified Provisional Acceptance Certificate under the MSA.
3. We, London Underground Limited, hereby confirm that subject to clause 15.25 of the MSA, the *[details of Train(s) receiving a Qualified Provisional Acceptance Certificate]* *[comply/complies]* with each of the Provisional Acceptance Criteria subject to the following Preconditions listed in the table below which the Manufacturer is required to satisfy in accordance with the Preconditions Timetable:

	Preconditions	Preconditions Timetable
1.		
2.		

4. Without prejudice to any other conditions to the Final Acceptance of such Trains(s) set out in clause 15.13 of the MSA, Final Acceptance of the Train(s) to which this certificate relates will not occur until the Manufacturer satisfies the Preconditions set out above in accordance with the deadline indicated in paragraph 3 of this certificate.
5. The issue by the Purchaser of this Qualified Provisional Acceptance Certificate for *[details of Train(s) receiving a QPAC]* does not imply that a Qualified Provisional Acceptance Certificate will be issued by London Underground Limited for any other Train (and clause 15.10 of the MSA continues to apply).
6. Any Qualified Provisional Acceptance by London Underground Limited shall be without prejudice to London Underground Limited's right to make a Precondition Retention for any Train pursuant to clause 15.11 of the MSA.

Signed for and on behalf of **London Underground Limited**

Signature:

Name:

Position:

Date:

FORM OF PROVISIONAL ACCEPTANCE CERTIFICATE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Provisional Acceptance Certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Provisional Acceptance Certificate.
2. This certificate constitutes a Provisional Acceptance Certificate under the MSA.
3. We, London Underground Limited, hereby confirm that subject to clause 15.25 of the MSA, the *[details of Train(s) receiving a Provisional Acceptance Certificate]* *[comply/complies]* with each of the Provisional Acceptance Criteria.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

FORM OF FINAL ACCEPTANCE CERTIFICATE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Final Acceptance Certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Final Acceptance Certificate.
2. This certificate constitutes a Final Acceptance Certificate under the MSA.
3. We, London Underground Limited, hereby confirm that subject to clause 15.25 of the MSA, the *[details of Train(s) receiving a Final Acceptance Certificate]* [comply/complies] with each of the Final Acceptance Criteria.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

FORM OF FLEET ACCEPTANCE CERTIFICATE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Fleet Acceptance Certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Fleet Acceptance Certificate.
2. This certificate constitutes a Fleet Acceptance Certificate under the MSA.
3. We, London Underground Limited, hereby confirm that subject to clause 15.25 of the MSA, the *[Piccadilly Line/Bakerloo Line/Central Line/Waterloo and City Line]* Fleet complies with each of the Fleet Acceptance Criteria.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

FORM OF EQUIPMENT ACCEPTANCE CERTIFICATE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Equipment Acceptance Certificate and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Equipment Acceptance Certificate.
2. This certificate constitutes an Equipment Acceptance Certificate under the MSA.
3. We, London Underground Limited, hereby confirm that subject to clause 15.25 of the MSA, the [details of:
 - [four (4) Train Driving Simulators]/[details of Train Driving Simulator receiving an Equipment Acceptance Certificate];
 - [the Base Order Spares]/[Spare, i.e. details of the Base Order Maintenance Spares, Base Order Purchaser Fault Spares or Base Order Warranty Spares tranche(s) receiving an Equipment Acceptance Certificate];
 - [the Base Order Special Tools]/[Special Tool, i.e. details of the Special Tool tranche(s) receiving an Equipment Acceptance Certificate];
 - [the Base Order Non-Standard Tools]/[Non-Standard Tool, i.e. details of the Non-Standard Tool tranche(s) receiving an Equipment Acceptance Certificate];
 - the Base Order Saloon Mock-up;
 - the OTC - Infrastructure-Borne Equipment; [and]
 - the Automatic Lineside Inspection Equipment,
 receiving an Equipment Acceptance Certificate]¹⁰ [comply/complies] with each of the relevant Equipment Acceptance Criteria.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

¹⁰ Note: delete as appropriate.

FORM OF CERTIFICATE OF COMMENCEMENT

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Certificate of Commencement and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Certificate of Commencement.
2. This certificate constitutes a Certificate of Commencement under the MSA.
3. We, London Underground Limited, hereby:
 - (a) acknowledge and agree that the conditions precedent set out in [clauses 2.3 and 2.4 of the MSA in the case of the Base Order] OR [clause 2.3 as amended by schedule 25 (Whole Line Options) of the MSA in the case of each Whole Line Option] have been satisfied (or agree to their waiver or deferral of the following conditions precedent [*list relevant CPs*], as applicable); and
 - (b) notify you, the Manufacturer, that the Commencement Date [for the Base Order] OR [for the [*insert relevant Whole Line Option*]] shall be [*insert date*].

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

FORM OF WHOLE LINE OPTION NOTICE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited ("Purchaser") and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Whole Line Option Notice and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Whole Line Option Notice.
2. This notice constitutes a Whole Line Option Notice under the MSA.
3. By delivering this notice, the Purchaser exercises the Whole Line Option in relation to the [Bakerloo Line][Central Line] [and at the same time in relation to the Waterloo & City Line]¹¹ [Waterloo & City Line in conjunction with the Base Order] on the terms set out in the MSA.
4. The Parties confirm that the information set out in the Appendix to this Whole Line Option Notice has been agreed between the Parties during the [period up to the Whole Line Option Notice Exercise Date].
5. The Whole Line Option Notice Exercise Date is the date this notice is given by the Purchaser to the Manufacturer which is *[insert date]*.
6. The Scheduled Commencement Date in relation to the Whole Line Option above is *[insert date]*.
7. [The Purchaser confirms that it requires the re-configuration of *[details of the number of Train Driving Simulators, including serial numbers or other identification that Purchaser requires re-configuring]* for training with respect to operation on the [Bakerloo Line][Central Line][Waterloo & City Line] in accordance with the terms of clause 6.3(d) and paragraph 4.4 of schedule 25 (Whole Line Options) of the MSA.]

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

¹¹ Note: if not exercised alongside the Base Order.

APPENDIX

Agreed Information¹²

¹² Note: The Appendix to the Whole Line Option Notice will set out the information that has been agreed during the pre-exercise consultation period pursuant to clause 6.10 of this Agreement – for example, the final WLO Key Programme Dates, final WLO Project Programme and information in relation to Hybrid Cooling.

FORM OF BASE ORDER OPTION NOTICE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited ("Purchaser") and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Base Order Option Notice and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Base Order Option Notice.
2. This notice constitutes a Base Order Option Notice under the MSA.
3. By delivering this notice, the Purchaser exercises a Base Order Option requiring the Manufacturer to supply to the Purchaser:
 - (a) ☒ Base Order Option Trains;]
 - (b) [Option Train Driving Simulators (as described in Part 1 of the Appendix to this Base Order Option Notice);] [and/or]
 - (c) [Base Order Option Cab Conversion Units (as described in Part 2 of the Appendix to this Base Order Option Notice),]¹³

in each case (A) supplying a sufficient quantity of associated Base Order Option Spares to comply with the Manufacturer's obligations in clause 7.15; and (B) on the terms of the MSA (including Part E: (Base Order Option Train Changes and WLO Additional Trains Changes) of schedule 12 (Change Procedure) and the Base Order Option Prices set out in Part C: (Base Order Options for supply of further Trains and Equipment) of schedule 10 (Milestones and Security) of the MSA).

4. The Base Order Option shall be implemented in accordance with a Change Confirmation Notice or Change Confirmation Notices pursuant to Part E: (Base Order Option Train Changes and WLO Additional Trains Changes) of schedule 12 (Change Procedure) of the MSA.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

¹³ Note: delete as appropriate.

Appendix

Part 1: Option Train Driving Simulators¹⁴

[●]

Part 2: Base Order Option Cab Conversion Units¹⁵

[●]

¹⁴ Note: insert details of any Option Train Driving Simulators to be supplied.

¹⁵ Note: insert details of any Base Order Option Cab Conversion Units to be supplied.

FORM OF WLO ADDITIONAL TRAINS OPTION NOTICE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited ("Purchaser") and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this WLO Additional Trains Option Notice and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this WLO Additional Trains Option Notice.
2. This notice constitutes a WLO Additional Trains Option Notice under the MSA.
3. By delivering this Notice, the Purchaser exercises a WLO Additional Trains Change requiring the Manufacturer to supply to the Purchaser:
 - (a) ☐ Bakerloo Line Additional Trains;]
 - (b) ☐ Bakerloo Line Extension Trains;]
 - (c) ☐ Central Line Additional Trains;]
 - (d) ☐ Waterloo & City Line Additional Trains;]
 - (e) [WLO Additional Train Driving Simulators (as described in Part 1 of the Appendix to this WLO Additional Trains Option Notice) in relation to the [Bakerloo Line][Central Line][Waterloo & City Line];] [and/or]
 - (f) [WLO Additional Cab Conversion Units (as described in Part 2 of the Appendix to this WLO Additional Trains Option Notice) in relation to the [Bakerloo Line][Central Line][Waterloo & City Line],]¹⁶

in each case (A) supplying a sufficient quantity of associated Base Order Option Spares to comply with the Manufacturer's obligations in clause 7.15 as amended by schedule 25; and (B) on the terms of the MSA (including Part E: (Base Order Option Train Changes and WLO Additional Trains Changes) of schedule 12 (Change Procedure) and the WLO Additional Trains Option Prices set out in Table 1 of paragraph 1, 2 or 3 of Appendix 4 to schedule 25 (Whole Line Options) of the MSA.

4. The WLO Additional Trains Change shall be implemented in accordance with a Change Confirmation Notice or Change Confirmation Notices pursuant to Part E: (Base Order Option Train Changes and WLO Additional Trains Changes) of schedule 12 (Change Procedure) of the MSA.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

¹⁶ Note: delete as appropriate.

Appendix

Part 1: WLO Additional Train Driving Simulators¹⁷

[●]

Part 2: WLO Additional Cab Conversion Units¹⁸

[●]

¹⁷ Note: insert details of any WLO Additional Train Driving Simulators to be supplied.

¹⁸ Note: insert details of any WLO Additional Cab Conversion Units to be supplied.

FORM OF BASE ORDER OPTION SPARES/SPECIAL TOOLS NOTICE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited ("Purchaser") and [] ("Manufacturer") (the "MSA")

1. Words and expressions defined in the MSA shall have the same meanings when used in this Base Order Option Spares/Special Tools Notice and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this Base Order Option Spares/Special Tools Notice.
2. This notice constitutes a Base Order Option Spares/Special Tools Notice under the MSA.
3. By delivering this Notice, the Purchaser exercises an option pursuant to clause 6.6(b) of the MSA requiring the Manufacturer to supply to the Purchaser:

(a) *[Insert details of Base Order Option Spares to be supplied];*

(b) *[Insert details of Base Order Option Special Tools to be supplied]; [and]*

(c) [●],

in each case at the price per Base Order Option Spare and/or Base Order Option Special Tool, and on the terms, set out in the Bill of Materials and otherwise on the terms of the MSA.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

FORM OF WLO ADDITIONAL OPTION SPARES / SPECIAL TOOLS NOTICE

[To be issued to Manufacturer on London Underground Limited's headed notepaper]

Manufacture and Supply Agreement dated [] and made between London Underground Limited ("Purchaser") and [] ("Manufacturer") (the "MSA")

4. Words and expressions defined in the MSA shall have the same meanings when used in this WLO Additional Spares/Special Tools Notice and the provisions of the MSA (including clause 62 (Governing Law and Jurisdiction)) shall, as applicable, apply to this WLO Additional Spares/Special Tools Notice.
5. This notice constitutes a WLO Additional Spares/Special Tools Notice under the MSA.
6. By delivering this Notice, the Purchaser exercises an option pursuant to clause 6.7(c) of the MSA requiring the Manufacturer to supply to the Purchaser:
 - (a) *[Insert details of WLO Additional Spares to be supplied];*
 - (b) *[Insert details of WLO Additional Special Tools to be supplied]; [and]*
 - (c) [●],

in each case at the price per WLO Additional Spare and/or WLO Additional Special Tool, and on the terms, set out in the Bill of Materials and otherwise on the terms of the MSA.

Signed for and on behalf of **London Underground Limited**

Signature

Name.....

Position.....

Date.....

Part B: Deed of Novation

THIS AGREEMENT is made the _____ day of _____ 20●

BETWEEN:

- (1) **LONDON UNDERGROUND LIMITED** (Registered Number 01900907) a company incorporated under the laws of England and Wales whose registered office is at 55 Broadway, London, United Kingdom, SW1H 0BD ("**Purchaser**");
- (2) **[NEW Purchaser]** (No. [company number]) whose registered office is at [registered office address] (the "**New Purchaser**"); and
- (3) **SIEMENS MOBILITY LIMITED** (Registered Number 016033) a company incorporated under the laws of England and Wales whose registered office is at Faraday House, Sir William Siemens Square, Frimley, Camberley, GU16 8QD ("**Manufacturer**").

WHEREAS:

- (A) The Purchaser has appointed the Manufacturer to perform the Works under a manufacturing and supply agreement dated [*to be inserted*] (the "**MSA**").
- (B) The Purchaser has entered into an agreement with the New Purchaser in respect of the Works.
- (C) The Purchaser, the Manufacturer and the New Purchaser have agreed that from the date of this Agreement, the New Purchaser shall assume the obligations of the Purchaser and that the Manufacturer shall perform its obligations under the MSA in favour of the New Purchaser and that the Purchaser on the one part and the Manufacturer on the other part shall each release the other from any obligations owed by the other to them under the MSA.

NOW IT IS HEREBY AGREED as follows:**1. NOVATION**

- 1.1 The Purchaser hereby releases and discharges the Manufacturer from any and all obligations and liabilities owed to the Purchaser under the MSA.
- 1.2 The Manufacturer undertakes to perform the MSA and to be bound by its terms in every way as if the New Purchaser were, and had been from the inception, a party to the MSA in lieu of the Purchaser.
- 1.3 The Manufacturer hereby releases and discharges the Purchaser from any and all obligations and liabilities owed to the Manufacturer under the MSA and accepts the obligations and liability of the New Purchaser under the MSA in lieu of the liability of the Purchaser.
- 1.4 Without prejudice to clause 1.2, the Manufacturer warrants to the New Purchaser that it shall be liable for any loss or damage suffered or incurred by the New Purchaser arising out of any negligent act, default or breach by the Manufacturer in the performance of its obligations under the MSA prior to the date of this Agreement. Subject to any limitation of liability in the MSA, the Manufacturer shall be liable for such loss or damage notwithstanding that such loss or damage would not have been suffered or incurred by the Purchaser (or suffered or incurred to the same extent by the Purchaser).
- 1.5 The Manufacturer acknowledges that fees and expenses properly due to the Manufacturer under the MSA in the sum of £[*to be inserted*] have, as at the date of this Agreement, been paid by the Purchaser.

- 1.6 The New Purchaser undertakes to perform the MSA and to be bound by its terms in every way as if the New Purchaser were, and had been from the inception, a party to the MSA in lieu of the Purchaser.

2. **PROPER LAW AND JURISDICTION**

This Agreement and the rights and obligations of the parties hereto shall be governed and construed in accordance with the laws of England and Wales and the Courts of England and Wales shall have exclusive jurisdiction over any dispute or difference (whether arising out of or in connection herewith) subject only to the rights of the parties to enforce a judgment obtained in the Courts of England and Wales in any other jurisdiction.

3. **CONTRACTS (RIGHTS OF THIRD PARTIES) ACT 1999**

Notwithstanding any other provision in this Agreement, nothing in this Agreement is intended to confer on any person any right to enforce any of the provisions of this Agreement which such person would not have had, but for the Contracts (Rights of Third Parties) Act 1999.

IN WITNESS whereof the parties hereto have executed this Agreement as a Deed the day and year first before written.

The common seal of **LONDON**)
UNDERGROUND LIMITED was affixed)
in the presence of:)

Director

Director/Secretary

The common seal of **[NEW**)
PURCHASER] was affixed in the)
presence of:)

Director

Director/Secretary

Executed as a deed by **SIEMENS**)
MOBILITY LIMITED)
acting by two authorised signatories:)
)

Signature of authorised signatory

Name of authorised signatory

Signature of authorised signatory

Name of authorised signatory

SCHEDULE 22

Form of Parent Company Guarantee



Parent Company Guarantee

Siemens Aktiengesellschaft

and

London Underground Limited

THIS DEED OF GUARANTEE is made on the 201[●]

BETWEEN:

- (1) **SIEMENS AKTIENGESELLSCHAFT** a company incorporated under the laws of Germany whose registered office is at Wittelsbacherplatz 2, 80333, Munich, Germany and which is registered under company number HRB 6684 (the "**Guarantor**"); and
- (2) **LONDON UNDERGROUND LIMITED** (No. 01900907) whose registered office is at 55 Broadway, London, United Kingdom, SW1H 0BD (the "**Purchaser**").

WHEREAS:

- (A) The Guarantor is the parent company of Siemens Mobility Limited (Registered Number 016033) a company incorporated under the laws of England and Wales whose registered office is at Faraday House, Sir William Siemens Square, Frimley, Camberley, GU16 8QD (the "**Manufacturer**").
- (B) The Purchaser and the Manufacturer have agreed to enter into an agreement (the "**MSA**") pursuant to which the Manufacturer will design, build, test, commission and supply rolling stock and related equipment for use in the provision of passenger services on certain parts of the LUL Network and provide other related services.
- (C) The Guarantor has agreed, as a condition precedent to the MSA (pursuant to clause 2.3(a) of the MSA), to guarantee the performance by the Manufacturer of its obligations under the MSA on the terms and conditions set out in this Guarantee.

NOW THIS DEED WITNESSES as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 Definitions

"**MSA**" has the meaning given to it in recital (B);

"**Manufacturer**" has the meaning given to it in recital (A);

"**Manufacturer's Obligations**" has the meaning given to it in clause 2; and

1.2 Interpretation

In this Guarantee, except where the context otherwise requires:

- (a) a reference to an enactment or statutory provision shall include a reference to any subordinate legislation made under the relevant enactment or statutory provision and is a reference to that enactment, statutory provision or subordinate legislation as from time to time amended, consolidated, modified, re-enacted or replaced;
- (b) words in the singular shall include the plural and vice versa;
- (c) references to one gender include other genders;
- (d) a reference to a person shall include a reference to a firm, a body corporate, an unincorporated association, a partnership or to an individual's executors or administrators and references to a company shall include Transport for London;
- (e) a reference to a clause shall be a reference to a clause of this Guarantee;

- (f) if a period of time is specified as from a given day, or from the day of an act or event, it shall be calculated exclusive of that day;
- (g) references to any English legal term for any action, remedy, method of judicial proceeding, legal document, legal status, court, official or any legal concept or thing shall in respect of any jurisdiction other than England be deemed to include what most nearly approximates the English legal term in that jurisdiction and references to any English statute or enactment shall be deemed to include any equivalent or analogous laws or rules in any other jurisdiction;
- (h) a reference to includes or including shall mean includes without limitation or including without limitation;
- (i) the contents page and headings in this Guarantee are for convenience only and shall not affect its interpretation;
- (j) references to this Guarantee include this Deed of Guarantee as amended or supplemented in accordance with its terms;
- (k) a reference to the Guarantor, the Purchaser or the Manufacturer includes their respective (and any subsequent) successor(s) in title, and their respective permitted transferee(s) or assignee(s);
- (l) references in this Guarantee to costs, expenses and losses which are to be indemnified to, or recovered by, the person incurring the same shall be construed as references to an amount equal to the amount of such costs, expenses and losses together with any amount that represents VAT or other similar tax properly chargeable therein in any jurisdiction;
- (m) references in this Guarantee to any other agreement or other instrument (other than an enactment or statutory provision) shall be deemed to be references to that agreement or instrument as from time to time amended, varied, supplemented, substituted, novated or assigned;
- (n) references to otherwise and words following other shall not be limited by any foregoing words where a wider construction is possible; and
- (o) words and expressions defined in the MSA shall, unless otherwise defined in this Guarantee, have the same meaning in this Guarantee.

1.3 **Deed**

The parties to this Guarantee intend it to take effect as a deed.

2. **GUARANTEE AND INDEMNITY**

- (a) In consideration of the Purchaser entering into the MSA with the Manufacturer, the Guarantor irrevocably and unconditionally:
 - (i) guarantees to the Purchaser for the benefit of the Purchaser:
 - (A) the proper, complete and punctual performance and observance by the Manufacturer of all of the Manufacturer's obligations, undertakings, duties and responsibilities under the MSA when such obligations, undertakings, duties and responsibilities become due according to the terms of the MSA; and
 - (B) the due and punctual payment and discharge by the Manufacturer of all sums, liabilities, awards, losses, damages, costs, charges and

expenses that may be or become due, owing or payable to the Purchaser under or arising out of the MSA in accordance with its terms or otherwise by reason of or in consequence of any breach thereof on the part of the Manufacturer (including legal fees, taxes and any other costs, on a full indemnity basis, incurred by the Purchaser in connection with the Purchaser validly and justifiably seeking to enforce any of the above),

(together, the "**Manufacturer's Obligations**"), and the Guarantor covenants and undertakes with the Purchaser that if and whenever the Manufacturer fails to pay, perform and/or discharge and/or is otherwise in default in respect of any of the Manufacturer's Obligations, the Guarantor shall within five (5) Working Days of being served a written demand by the Purchaser, pay, fully perform and/or discharge or procure the payment, full performance and/or discharge of the Manufacturer's Obligations and make good the failure or other default as if the Guarantor, instead of the Manufacturer, was expressed to be the principal obligor; and

- (ii) agrees with the Purchaser, as a separate, independent, primary and additional obligation (and without prejudice to clause 2(a)(i), (b) and/or clause 15), to indemnify and keep indemnified the Purchaser within five (5) Working Days of being served a written demand by the Purchaser and on an after tax basis in respect of all losses, damages, costs, claims, liabilities, demands and expenses arising from the Manufacturer failing to pay, fully perform and/or discharge and/or being otherwise in default in respect of any of the Manufacturer's Obligations or as a result of any of the Manufacturer's Obligations being or becoming void, voidable, unenforceable or ineffective as against the Manufacturer for any reason whatsoever whether or not known to the Manufacturer or any other person, and the amount of such losses, damages, costs, claims, liabilities, demands and expenses is the amount which the person suffering it would otherwise have been entitled to recover from the Manufacturer on the assumption that the MSA is not void, voidable, unenforceable or ineffective against the Manufacturer.
- (b) The Guarantor's liability under this Guarantee (including the liability provided for in clause 15) shall, notwithstanding the multiple draws under this Guarantee, be limited to the Manufacturer's liability under the MSA (except in relation to any costs incurred in enforcing this Guarantee and any costs incurred pursuant to clause 14 and/or clause 21 hereof) such liability to be determined on the assumption that the MSA is not void, voidable, unenforceable or ineffective against the Manufacturer.

3. **PRINCIPAL OBLIGOR**

Without prejudice to the Purchaser's rights against the Manufacturer as principal obligor, the Guarantor shall be deemed the principal obligor in respect of its obligations under this Guarantee and not merely a surety and accordingly the Guarantor shall not be discharged nor shall its liability under this Guarantee be affected by any act or thing or means whatsoever by which its said liability would have been discharged or affected if it had not been the principal obligor.

4. **WAIVER OF DEFENCES**

The obligations of the Guarantor under this Guarantee will not be affected by (and the intention of the Guarantor is that its obligations shall continue in full force and effect notwithstanding) any act, omission, matter or thing which, but for this clause 4, would reduce, release or prejudice any of its obligations under this Guarantee (without limitation and whether or not known to it or the Purchaser) including:

- (a) any termination, alteration, amendment, variation, novation, supplement, extension or reinstatement to any provision of the MSA or in the extent or nature or method or timing of the Manufacturer's Obligations, or novation of the MSA (in whole or in part) (in all cases, however fundamental), provided that the Guarantor's obligations under this Guarantee shall be varied to the extent of any such alteration, amendment, variation, supplement, extension or reinstatement;
- (b) the taking, variation, compromise, exchange, renewal or release of, or refusal or neglect to perfect, take up or enforce, any rights against, or security over assets of, the Manufacturer or other person or any non-presentation or non-observance of any formality or other requirement in respect of any instrument or any failure to realise the full value of any security;
- (c) any incapacity or lack of power, authority or legal personality of or dissolution or change in the members or status of the Manufacturer or any other person;
- (d) the granting by the Purchaser of any time, indulgence, concession, consent or waiver granted to, or any concession or arrangement made with, the Manufacturer or any other person (whether expressly or by conduct);
- (e) the granting of any other bond, security or guarantee now or hereafter held by the Purchaser for all or any part of the Manufacturer's Obligations;
- (f) the release or waiver of any such bond, security or guarantee referred to in clause 4(e) above;
- (g) any claim or enforcement of payment from the Manufacturer or any other person;
- (h) any act or omission which would not have discharged or affected the liability of the Guarantor had it been a principal debtor instead of a guarantor or by anything done or omitted which but for this provision might operate to exonerate the Guarantor;
- (i) any delay or forbearance by the Purchaser in exercising its rights or remedies under this Guarantee, or the enforcement or absence of enforcement of this Guarantee;
- (j) the bankruptcy, insolvency, liquidation, winding-up, dissolution, administration or incapacity of (or the appointment of an administrator or receiver of) or the amalgamation, reconstruction, merger, reorganisation or any analogous proceeding relating to the Manufacturer or the Guarantor or any change in status, function, control or ownership of the Manufacturer;
- (k) the illegality, invalidity, unenforceability or frustration of the MSA or any of the Manufacturer's Obligation(s) for any reason, or any defect in any provision of, the MSA or any other security given in relation to the Manufacturer's Obligations;
- (l) any present or future law or regulations purporting to reduce or prejudice any of the Manufacturer's Obligations;
- (m) any other act, event, fact, circumstance or omission which, but for the provisions of this Guarantee, and in particular this clause 4, might operate to discharge, impair or otherwise affect any of the obligations of the Guarantor contained in this Guarantee or any of the rights, powers or remedies conferred upon the Purchaser by this Guarantee or by law; and
- (n) anything that the Purchaser may do, or omit or neglect to do which, but for this provision, might exonerate, discharge, reduce or extinguish the liability of the Guarantor under this Guarantee.

5. **DISCHARGE**

Notwithstanding any composition, release, arrangement or waiver effected by the Purchaser with the Manufacturer, the Guarantor's liability under this Guarantee shall be discharged only by performance, payment and/or discharge by the Guarantor to the Purchaser in full of the Manufacturer's Obligations from time to time.

6. **CONTINUING OBLIGATIONS**

6.1 **Continuing Guarantee**

This Guarantee shall be a continuing guarantee and shall remain in operation and full force and effect until all the Manufacturer's Obligations (whether actual or contingent) have been duly and completely performed and observed and the Manufacturer shall have ceased to be under any actual or contingent liability to the Purchaser under the MSA and all obligations (whether actual or contingent) of the Guarantor under this Guarantee have been satisfied or performed in full.

6.2 **Future Exercise**

No single exercise of any right, power or privilege conferred by this Guarantee shall preclude any other or future exercise thereof or the exercise of any other right, power or privilege, nor shall any failure or delay by the Purchaser in exercising any right, power or privilege under this Guarantee or the MSA operate as a waiver thereof.

6.3 **Unlimited Demands**

The Purchaser is entitled to make any number of demands under this Guarantee.

7. **REINSTATEMENT**

If any payment by the Manufacturer or Guarantor or any discharge given by the Purchaser (whether in respect of Manufacturer's Obligations or the obligations of the Guarantor or any security for those obligations or otherwise) is avoided or reduced as a result of insolvency or any similar event:

- (a) the liability of the Manufacturer and Guarantor shall continue as if the payment, discharge, avoidance or reduction had not occurred; and
- (b) the Purchaser shall be entitled to recover the value or amount of that security or payment from the Manufacturer or Guarantor, as if the payment, discharge, avoidance or reduction had not occurred.

8. **ENFORCEMENT**

This Guarantee may be enforced without taking any proceedings or demanding upon, enforcing or exhausting any right or remedy against the Manufacturer or any other person, or taking any action to enforce any other security, bond or guarantee held by the Purchaser or making or filing any claim in a bankruptcy, liquidation, administration or insolvency of the Manufacturer or any person. This Guarantee is in addition to and not in substitution for any present and future guarantee, lien or other security to be held by the Purchaser. The Purchaser's rights hereunder are in addition to and not exclusive of those provided by law (in accordance with clause 20), in the MSA or in any other document, instrument or agreement executed in connection with the MSA.

9. **NON-COMPETITION**

9.1 **Non-competition**

Until all amounts which may be or become payable and all liabilities, obligations, warranties, duties and undertakings in respect of the Manufacturer's Obligations have been irrevocably paid, performed or discharged in full, the Guarantor shall not, after a claim has been made or by virtue of any payment, performance or discharge by it under or in accordance with this Guarantee:

- (a) be subrogated to any rights, security or moneys held, received or receivable by the Purchaser (or any trustee or agent on its behalf) or be entitled to any right or contribution or indemnity in respect of any payment made or moneys received on account of the Guarantor's liability under this Guarantee;
- (b) claim, rank, prove or vote as a creditor of the Manufacturer or its estate in competition with the Purchaser (or any trustee or agent on its behalf); or
- (c) receive, claim or have the benefit of any payment, distribution or security from or on account of the Manufacturer, or exercise any rights of set-off as against the Manufacturer.

9.2 **Trust**

The Guarantor shall hold in trust for and forthwith pay or transfer to the Purchaser any payment or distribution or benefit of security received by it either contrary to this clause 9 or as a result of a direction of the Purchaser under clause 9.1(b) or 9.1(c).

9.3 **Suspense account**

Until all the Manufacturer's Obligations have been irrevocably satisfied in full, the Purchaser may place and keep any money received or recovered from the Guarantor in relation to the Manufacturer's Obligations in a Suspense account.

10. **ADDITIONAL SECURITY**

This Guarantee is in addition to and is not in any way prejudice by any other security now or subsequently held by the Purchaser.

11. **RETENTION OF THIS GUARANTEE**

The Purchaser shall be entitled to retain this Guarantee after as well as before the payment or discharge of all of the Manufacturer's Obligations for such period as the Purchaser may determine. At such time as the Guarantor considers that all of the Manufacturer's Obligations and that all of the Guarantor's obligations under this Guarantee have been paid and/or discharged in full as applicable, it may request that the Purchaser provide confirmation in writing of such payment and discharge. The Purchaser shall provide such confirmation in writing if it agrees that all the Manufacturer's Obligations and Guarantor's obligations under this Guarantee have been paid and/or discharged in full in accordance with this Guarantee.

12. **REPRESENTATIONS AND WARRANTIES**

12.1 **Security**

The Guarantor warrants that it has not taken or received, and undertakes that until all the Manufacturer's Obligations or other amounts due under this Guarantee have been performed, paid or discharged in full, it will not take or receive, the benefit of any security

or encumbrance of any kind from the Manufacturer or any other person in respect of its obligations under this Guarantee.

12.2 **Representations and Warranties**

The Guarantor represents and warrants in favour of the Purchaser that:

- (a) it is duly formed and validly existing under the laws of its jurisdiction of formation and has the full corporate power and authority to own its assets and to carry on its business as is now being conducted by it;
- (b) it has full corporate power and authority to enter into, perform and deliver, and has taken all necessary action to authorise the entry into, performance and delivery of, this Guarantee;
- (c) this Guarantee constitutes, subject to any general principles of law limiting its obligations, its legal, binding, valid and enforceable obligations;
- (d) the entry into and performance by it of, and the transactions contemplated by, this Guarantee do not and will not conflict with or result in a breach of:
 - (i) any law or regulation or judicial or official order to which the Guarantor is subject; or
 - (ii) its constitutional documents; or
 - (iii) any agreement or instrument which is binding upon it or any of its assets or result in the creation of (or a requirement for the creation of) any security or encumbrance of any kind over its assets;
- (e) to the best knowledge and belief of the Guarantor there is no litigation, arbitration or administrative proceedings, in each case current or pending, of or before any court, arbitral body or agency of any country threatened against the Guarantor which separately or in the aggregate, could have a material adverse effect on the ability of the Guarantor to perform its obligations under this Guarantee;
- (f) the execution by it of this Guarantee constitutes, and the exercise by it of its rights and performance of its obligations under this Guarantee will constitute, private and commercial acts performed for private and commercial purposes and it will not be entitled to claim immunity from suit, execution, attachment or other legal process in any proceedings taken in its jurisdiction of incorporation in relation to this Guarantee; and
- (g) without prejudice to the generality of clause 12.2(c) its:
 - (i) irrevocable submission under this Guarantee to the exclusive jurisdiction of the courts of England;
 - (ii) agreement that this Guarantee is governed by English law; and
 - (iii) agreement not to claim any immunity to which it or its assets may be entitled,

are legal, valid and binding under the laws of its jurisdiction of incorporation and any judgment obtained in England will be recognised and be enforceable by the courts of its jurisdiction of incorporation, subject to any provisions of German law which allow a German Court to refuse to recognise a judgement of a foreign court.

13. WITHHOLDINGS AND DEDUCTIONS

All payments to be made by the Guarantor under this Guarantee shall be made without any set-off, counterclaim or equity and (subject to the following sentence) free from, clear of and without deduction for any taxes, duties, levies, imposts or charges whatsoever, present or future. If the Guarantor is compelled by the law of any applicable jurisdiction (or by an order of any regulatory authority in such jurisdiction) to withhold or deduct any sums in respect of taxes, duties, levies, imposts or charges from any amount payable to the Purchaser under this Guarantee or, if any such withholding or deduction is made in respect of any recovery under this Guarantee, the Guarantor shall pay such additional amount so as to ensure that the net amount received by the Purchaser shall equal the full amount due to it under the provisions of this Guarantee (had no such withholding or deduction been made).

14. PAYMENTS AND INTEREST**14.1 Payments**

- (a) All payments by the Guarantor under this Guarantee must be made to the Purchaser to its account at a bank in the United Kingdom as the Purchaser may notify the Guarantor on the date of this Guarantee or otherwise in any notice of demand served under the terms of clause 2.
- (b) If a payment under this Guarantee is due on a day which is not a Working Day the due date for that payment will instead be the next Working Day.
- (c) If this Guarantee does not provide for when a particular payment is due, that payment will be due within 30 Working Days of demand by the Purchaser.

14.2 Interest Rate

The Guarantor hereby agrees to pay to the Purchaser, in respect of any amount demanded from it in accordance with this Guarantee, interest at the Default Rate from first demand by the Purchaser of the Manufacturer.

14.3 Accrual of Interest

Such interest at the Default Rate shall accrue due on a daily basis from the demand by the Purchaser until actual payment by the Guarantor (both before and after any further demand or judgment or the liquidation of the Guarantor or the Manufacturer).

15. INDEMNITY

As a separate, independent and additional obligation (and without prejudice to clause 2) the Guarantor unconditionally and irrevocably agrees (for the benefit of the Purchaser) to indemnify and keep indemnified the Purchaser within five (5) Working Days of being served a written demand by the Purchaser and on an after tax basis in respect of all losses, damages, costs, claims, liabilities, demands and expenses which may be suffered or reasonably incurred by the Purchaser and arise from any default or breach by the Guarantor of its obligations under this Guarantee.

16. ASSIGNMENT / NOVATION**16.1 The Purchaser's Assignment / Novation**

The Purchaser may at any time assign, transfer or novate without the consent of the Guarantor, the benefit of and/or its rights and/or obligations under this Guarantee (whether or not accrued), to any person to whom the benefit of the MSA is assigned, transferred or, as applicable, to whom the MSA is novated in accordance with and subject

to the terms thereof and the Guarantor shall at its own cost execute such documents and do such other things as the Purchaser may reasonably require in order to facilitate and perfect such assignment, transfer or novation.

16.2 **Guarantor's Assignment**

The Guarantor may not assign or transfer any of its rights or obligations under this Guarantee.

17. **SEVERANCE**

If any provision or part of this Guarantee is illegal, void or unenforceable due to any applicable law, it shall be deemed to be deleted and the remaining provisions of this Guarantee shall continue in full force and effect.

18. **NO WAIVER**

The rights and remedies of the parties to this Guarantee shall not be affected by any failure to exercise or delay or forbearance in exercising any right or remedy or by the giving of any indulgence by one party to this Guarantee or by anything whatsoever except a specific waiver or release in writing and any such waiver or release shall not prejudice or affect any other rights or remedies of the parties to this Guarantee. No single or partial exercise of any right or remedy shall prevent any further or other exercise thereof or the exercise of any other right or remedy.

19. **ENTIRE AGREEMENT**

19.1 **Whole Agreement**

Each party confirms that this Guarantee and any other documents referred to in this Guarantee represents the entire understanding, and constitutes the whole agreement, in relation to its subject matter and supersedes any previous agreement between the parties with respect thereto.

19.2 **Non-Reliance**

Each party acknowledges that:

- (a) entering into this Guarantee it has not relied on any representation, warranty, assurance, covenant, indemnity, undertaking or commitment which is not expressly set out or referred to in this Guarantee or any other documents referred to in this Guarantee; and
- (b) neither party has any other right or remedy (whether by way of a claim for contribution or otherwise) in tort (including negligence) or for misrepresentation (whether negligent or otherwise, and whether made prior to, and/or in, this Guarantee) save for any liability for fraudulent misrepresentation or fraudulent misstatement.

20. **RIGHTS CUMULATIVE WITH THOSE AT LAW**

20.1 **Rights Cumulative**

The powers, rights and remedies conferred on the parties herein shall be in addition and without prejudice to all other powers, rights and remedies available to the parties by law.

20.2 Equitable Remedies

Without prejudice to any other rights or remedies that the parties may have, the parties acknowledge and agree that the remedies of injunction and specific performance as well as any other equitable relief for any threatened or actual breach of the provisions of this Guarantee by any party shall be available to the parties and that no proof of special damages shall be necessary for the enforcement of the provisions of this Guarantee

21. COSTS

Each party shall be responsible for their own legal costs in relation to the negotiation and execution of this Guarantee.

22. LANGUAGE

This Guarantee is executed in English and all communications under this Guarantee shall be made in English.

23. CURRENCY AND EXCHANGE RATE

All payments under this Guarantee shall be made in pounds sterling. All risks associated with movements in foreign currency exchange rates and/or the costs of activities performed outside of the United Kingdom shall be borne by the Guarantor.

24. CONFIDENTIALITY

The parties hereby agree that the terms of clause 38 (Confidentiality) of the MSA shall apply as appropriate to this Guarantee as if set out in this Guarantee in full save that references to Manufacturer shall be replaced by Guarantor and references to Agreement shall be replaced by "Guarantee".

25. VARIATION

No variation of this Guarantee shall be effective unless it is made by deed and executed by or on behalf of each of the parties to this Guarantee. The expression variation includes supplement, deletion or replacement, however effected.

26. FURTHER ASSURANCE

Each party to this Guarantee shall (at its own cost) do and execute, or arrange for the performance and execution of, each necessary act or document to implement its obligations under this Guarantee.

27. COUNTERPARTS

This Guarantee may be executed in any number of counterparts and by the parties to it on separate counterparts, each of which when so executed and delivered shall be an original but all the counterparts shall together constitute one and the same instrument.

28. CONTRACTS (RIGHTS OF THIRD PARTIES) ACT

No provision of this Guarantee is enforceable under the Contracts (Rights of Third Parties) Act 1999 by a person who is not a party to this Guarantee.

29. **NOTICES**

29.1 **Requirement for notice in writing**

Any notice, consent, approval, certificate or determination to be given or issued by any person under this Guarantee shall be deemed a notice and shall be in writing unless otherwise specified and the words notify, consent, approve, certify and determined shall be construed accordingly.

29.2 **Service of notices**

(a) Subject to clause 29.2(b), any notice made under or in connection with the matters contemplated by this Guarantee shall be deemed duly given if delivered personally or sent by email or by prepaid first-class post or by airmail if posted to or from a place outside the United Kingdom in accordance with the requirements of this clause 29.

(b) Notices shall be served:

(c) If to the Purchaser to:

London Underground Limited

Address: 55 Broadway, London, United Kingdom, SW1H 0BD

Attention: Company Secretary

Fax: +44 (0) 20 7126 4598

If to the Guarantor to:

Address: Siemens AG c/o Siemens plc Faraday House, Sir William Siemens Square, Frimley, Camberley, GU16 8QD

Attention: Company Secretary

29.3 **Time of service**

A notice shall be deemed to have been received:

- (a) if delivered by hand, at the time when the notice is left at the address of the party to be served;
- (b) if sent by first-class post, on the Working Day next following the day of posting or, if the day of posting was not a Working Day, the Working Day next following the first Working Day after the day of posting;
- (c) if sent by airmail, five (5) Working Days after the day of posting; and
- (d) if sent by email, upon receipt by the sender of a "delivered" confirmation (provided that the sender shall not be required to produce a "read" confirmation),

provided that if, in accordance with the above provision, any such notice would otherwise be deemed to be given or made after 5.00 p.m. such notice shall be deemed to be given or made at 9.00 a.m. on the next Working Day. For the purposes of this clause, all times are to be read as local time in the place of deemed receipt.

29.4 **Change of details**

A party may notify the other party to this Guarantee of a change to its name, relevant addressee, postal address or email address to update the information in clause 29.2(b) provided that such notification shall only be effective:

- (a) on the date specified in the notification as the date on which the change is to take place; or
- (b) if no date is specified or the date specified is less than five (5) Working Days after the date on which notice is given, the date falling five (5) Working Days after notice of any such change has been given.

30. **GOVERNING LAW AND JURISDICTION**

30.1 **Governing Law**

This Guarantee and any non-contractual obligations arising out of it or in connection with it shall be governed by, and construed in accordance with, English law.

30.2 **Exclusive Jurisdiction**

- (a) For the benefit of the Purchaser and subject to clause 30.2(b), the parties irrevocably agree that the courts of England are to have exclusive jurisdiction for the purpose of hearing and determining any suit, action or proceedings and/or to settle any disputes arising out of or in any way relating to this Guarantee or its formation (Proceedings) and for the purpose of enforcement of any judgment against its property or assets.
- (b) Nothing in this clause shall (or shall be construed so as to) limit the right of the Purchaser to take Proceedings against the Guarantor in the courts of any country in which the Guarantor has assets or in any other court of competent jurisdiction nor shall the taking of Proceedings in any one or more jurisdiction preclude the taking of proceedings in any other jurisdiction (whether concurrently or not) if and to the extent permitted by applicable law.

30.3 **Forum**

Each party irrevocably waives any right that it may have to object to any Proceedings being brought in the English Courts, to claim that the Proceedings have been brought in an inconvenient forum, or to claim that the English Courts do not have jurisdiction.

30.4 **Service of Process**

- (a) Without prejudice to any other mode of service allowed under any relevant law, the Guarantor irrevocably appoints Siemens plc whose registered office is at Siemens plc, Faraday House, Sir William Siemens Square, Frimley, Camberley, Surrey, GU16 8QD, United Kingdom as its agent for service of process in relation to any proceedings before the English courts in connection with this Guarantee and agrees that failure by a process agent to notify the Guarantor of the process will not invalidate the proceedings concerned.
- (b) The Purchaser agrees that the documents which commence any Proceedings and any other documents required to be served in relation to those Proceedings may be served on it at its address specified above or such other address in the United Kingdom as notified in accordance with clause 29 from time to time.

30.5 **Final Determination**

The parties acknowledge and agree that any final determination, where all rights of appeal have been exhausted or expired, of the Manufacturer's liability in respect of an issue to which this Guarantee applies, will be conclusive evidence of the Guarantor's liability under this Guarantee with respect to such issue or issues.

IN WITNESS of which the Guarantor and the Purchaser have executed and delivered this Guarantee as a Deed the day and year first above written.

The common seal of **LONDON**)
UNDERGROUND LIMITED was affixed)
in the presence of:)

Director

Director/Secretary

Executed as a deed by)
SIEMENS AKTIENGESELLSCHAFT)
acting by :)
)

Signature of director

Signature of witness

Name of witness

Address of witness

.....

.....

Occupation of witness

SCHEDULE 23

Intellectual Property

Part A: Software Escrow Agreement



Software Escrow Agreement

Date: []

Owner: []

Agreement Number: []

Notice: The parties to this Agreement are obliged to inform NCC Group of any changes to the Package or in their circumstances (including change of name, registered office, contact details or change of owner of the intellectual property in the Package).

Escrow Agreement Dated:**Between:**

- (1) **SIEMENS MOBILITY LIMITED** (Registered Number 016033) a company incorporated under the laws of England and Wales whose registered office is at Faraday House, Sir William Siemens Square, Frimley, Camberley, GU16 8QD ("**Owner**");
- (2) **LONDON UNDERGROUND LIMITED** a company registered in England whose registered office is at 55 Broadway, London, United Kingdom, SW1H 0BD (Company Registration Number: 01900907) ("**Licensee**"); and
- (3) **NCC GROUP ESCROW LIMITED** a company registered in England whose registered office is at Building 2 Hardman Boulevard, Spinningfields, Manchester, M1 7EF, England, M3 3AQ (Company Registration Number: 03081952) ("**NCC Group**").

Background:

- (A) The Licensee has contracted with the Owner for the purchase of a new fleet of trains, associated spares and other tools subject to the terms set out in the Licence Agreement.
- (B) The Licensee has contracted with the Service Provider for the subsequent technical support of the trains, associated spares and other tools subject to the terms of the Fleet Support Agreement.
- (C) The Licensee has been granted a licence under the Licence Agreement to use the Package which comprises computer programs.
- (D) Certain technical information and/or documentation relating to the software package is the confidential information and intellectual property of the Owner or a third party.
- (E) The Owner acknowledges that in certain circumstances, such information and/or documentation would be required by the Licensee in order for it to continue to exercise its rights under the Licence Agreement.
- (F) The parties therefore agree that such information and/or documentation should be placed with a trusted third party, NCC Group, so that such information and/or documentation can be released to the Licensee should certain circumstances arise.

Agreement:

In consideration of the mutual undertakings and obligations contained in this Agreement, the parties agree that:

1. **Definitions and Interpretation**

- 1.1 In this Agreement the following terms shall have the following meanings:

"Agreement" means the terms and conditions of this escrow agreement set out below, including the appendices hereto.

"Confidential Information" means all technical and/or commercial information not in the public domain and which is designated in writing as confidential by any party together with all other information of any party which may reasonably be regarded as confidential information.

"Full Verification" means the tests and processes forming NCC Group's Full Verification service and/or such other tests and processes as may be agreed between the parties for the verification of the Material.

"Fleet Support Agreement" or "FSA" means the agreement between the Service Provider and the Licensee (as Customer) pursuant to which the Service Provider will provide additional spares and undertake certain technical support services in respect of the trains supplied under the Licence Agreement, entered into on or around the date of the Licence Agreement.

"Independent Expert" means a suitably qualified and independent solicitor or barrister.

"Integrity Testing" means those tests and processes forming NCC Group's Integrity Testing service, in so far as they can be applied to the Material.

"Intellectual Property Rights" mean any copyright, patents, design patents, registered designs, design rights, utility models, trademarks, service marks, trade secrets, know how, database rights, moral rights, confidential information, trade or business names, domain names, and any other rights of a similar nature including industrial and proprietary rights and other similar protected rights in any country or jurisdiction together with all registrations, applications to register and rights to apply for registration of any of the aforementioned rights and any licences of or in respect of such rights.

"Licence" means the licence granted to the Licensee to use the Package.

"Licence Agreement" means the agreement listed in appendix 3 under which the Licensee was granted the Licence.

"Material" means the Source Code of the Package and such other material and documentation (including updates and upgrades thereto and new versions thereof) as are necessary to be delivered or deposited to comply with clause 2 of this Agreement.

"Order Form" means the order form setting out the details of the order placed with NCC Group for setting up this Agreement.

"Package" means the software package together with any updates and upgrades thereto and new versions thereof licensed to the Licensee under the Licence Agreement details of which are set out in appendix 1.

"Release Events" has the meaning given to it in clause 6.1 of this Agreement.

"Release Purposes" means the purposes of understanding, maintaining, modifying and correcting the Package exclusively for and on behalf of the Licensee together with such other purposes (if any) as are permitted under the Licence Agreement.

"Source Code" means the computer programming code of the Package in human readable form.

"Third Party Material" means Source Code which is not the confidential information and intellectual property of the Owner or the Licensee.

1.2 This Agreement shall be interpreted in accordance with the following:

1.2.1 headings are for ease of reference only and shall not be taken into consideration in the interpretation of this Agreement;

1.2.2 all references to clauses and appendices are references to clauses and appendices of this Agreement;

1.2.3 all references to a party or parties are references to a party or parties to this Agreement; and

- 1.2.4 capitalised terms used and not defined in this Agreement shall have the meaning ascribed to such terms in the Licence Agreement.

2. **Owner's Duties and Warranties**

2.1 The Owner shall:

- 2.1.1 deliver a copy of the Material to NCC Group as soon as reasonably practicable after its creation and in any event within 28 days of the commencement of the Testing and Inspection Programme;

- 2.1.2 deliver a further copy of the Material to NCC Group:

2.1.2.1 each time that there is a change to the Package; and

2.1.2.2 on the occurrence of the events listed in clause 29.12(b) of the Licence Agreement;

- 2.1.3 ensure that each copy of the Material deposited with NCC Group comprises the Source Code of the latest version of the Package used by the Licensee;

- 2.1.4 deliver to NCC Group a replacement copy of the Material within 30 days after the anniversary of the last delivery of the Material to ensure that the integrity of the Material media is maintained;

- 2.1.5 deliver a replacement copy of the Material to NCC Group within 14 days of a notice given to it by NCC Group under the provisions of clause 4.1.3;

- 2.1.6 deliver with each deposit of the Material the following information:

2.1.6.1 details of the deposit including the full name of the Package (i.e. the original name as set out under Appendix 1 together with any new names given to the Package by the Owner), version details, media type, backup command/software used, compression used, archive hardware and operating system details;

2.1.6.2 password/encryption details required to access the Material; and

2.1.6.3 any other information or documentation required to be disclosed under the Licence Agreement or to facilitate the use of any of the Material.

- 2.1.7 deliver with each deposit of the Material the following technical information (where applicable):

2.1.7.1 documentation describing the procedures for building, compiling and installing the software, including names and versions of the development tools;

2.1.7.2 software design information (e.g. module names and functionality); and

2.1.7.3 name and contact details of employees with knowledge of how to maintain and support the Material; and

- 2.1.8 if required by the Licensee, deposit a backup copy of the object code of any third party software package and any other information or documentation required to access, install, build or compile or otherwise use the Material.

- 2.2 The Owner warrants to both NCC Group and the Licensee at the time of each deposit of the Material with NCC Group that:

- 2.2.1 other than any third party object code referred to in clause 2.1.8 or any Third Party Material or any Material owned by the Licensee by virtue of the provisions of the Licence Agreement, it owns the Intellectual Property Rights in the Material;
- 2.2.2 in respect of any Third Party Material, it has been granted valid and ongoing rights under licence by the third party owner(s) thereof to deal with such Third Party Material in the manner anticipated under this Agreement and that the Owner has the express authority of such third party owner(s) to deposit the Third Party Material under this Agreement as evidenced by a signed letter of authorisation in the form required by NCC Group;
- 2.2.3 in entering into this Agreement and performing its obligations under it, it is not in breach of any of its ongoing express or implied obligations to any third party(s);
- 2.2.4 the Material deposited under clause 2.1 contains all information in human-readable form (except for any third party object code deposited pursuant to clause 2.1.8) and is on suitable media to enable a reasonably skilled programmer or analyst to understand, maintain, modify and correct the Package; and
- 2.2.5 in respect of any third party object code that the Owner, at its option, or, at the request of the Licensee, deposits with NCC Group in conjunction with the Material pursuant to clause 2.1.8, it has the full right and authority to do so.

3. Licensee's Responsibilities and Undertakings

- 3.1 The Licensee shall notify NCC Group of any change to the Package that necessitates a replacement deposit of the Material.
- 3.2 In the event that the Material is released under clause 6, the Licensee shall, subject to the terms of the Licence Agreement:
 - 3.2.1 keep the Material confidential at all times, on the basis set out in the Licence Agreement;
 - 3.2.2 use the Material only for the Release Purposes;
 - 3.2.3 not disclose the Material to any person save: (i) such of the Licensee's employees or contractors who need to know the same for the Release Purposes; and (ii) as permitted by the Licence Agreement. In the event that Material is disclosed to its employees or contractors, the Licensee shall ensure that they are bound by the same confidentiality obligations as are contained in this clause 3.2 or otherwise set out in the Licence Agreement;
 - 3.2.4 hold all media containing the Material in a safe and secure environment when not in use; and
 - 3.2.5 forthwith destroy the Material should the Licensee cease to be entitled to use the Package under the terms of the Licence Agreement.
- 3.3 In the event that the Material is released under clause 6, it shall be the responsibility of the Licensee to obtain the necessary licences to utilise the object code of any third party material deposited by the Owner pursuant to clause 2.1.8.

4. NCC Group's Duties

- 4.1 NCC Group shall:
 - 4.1.1 at all times during the term of this Agreement, retain the latest deposit of the Material in a safe and secure environment;

- 4.1.2 inform the Owner and the Licensee of the receipt of any deposit of the Material by sending to both parties a copy of the Integrity Testing report or Full Verification report (as the case may be) generated from the testing processes carried out under clause 10; and
- 4.1.3 notify the Owner and the Licensee if it becomes aware at any time during the term of this Agreement that the copy of the Material held by it has been lost, damaged or destroyed so that a replacement may be obtained.
- 4.2 In the event of failure by the Owner to deposit any Material with NCC Group, NCC Group shall not be responsible for procuring such deposit and may, at its sole discretion, notify the Licensee of the Owner's failure to deposit any Material.
- 4.3 NCC Group may appoint agents, contractors or sub-contractors as it deems fit to carry out the Integrity Testing and the Full Verification processes. NCC Group shall ensure that any such agents, contractors and sub-contractors are bound by the same confidentiality obligations as are contained in clause 8.
- 4.4 NCC Group has the right to make such copies of the Material as may be necessary solely for the purposes of this Agreement.
- 5. **Payment**
 - 5.1 The parties shall pay NCC Group's standard fees and charges as published from time to time or as otherwise agreed, in the proportions set out in appendix 2. NCC Group's fees as published are exclusive of value added tax.
 - 5.2 NCC Group shall be entitled to review and vary its standard fees and charges for its services under this Agreement from time to time but no more than once a year and only upon 45 days written notice to the parties.
 - 5.3 All invoices are payable within 30 days from the date of invoice. NCC Group reserves the right to charge interest in respect of the late payment of any sum due under this Agreement (both before and after judgement) at the rate of 2% per annum over the prevailing base rate of HSBC Bank Plc accruing on a daily basis from the due date therefor until full payment.
- 6. **Release Events**
 - 6.1 Subject to: (i) the remaining provisions of this clause 6 and (ii) the receipt by NCC Group of its release fee and any other fees and interest (if any) outstanding under this Agreement, NCC Group will release the Material to a duly authorised officer of the Licensee if any of the following events ("**Release Event(s)**") occur:
 - 6.1.1 if the Owner or Service Provider is a company:
 - 6.1.1.1 an order is made for the winding up of the Owner or Service Provider, the Owner or Service Provider passes a resolution for winding up (other than for the purposes of a solvent reconstruction or amalgamation) or a liquidator of the Owner or Service Provider is appointed; or
 - 6.1.1.2 an order is made for the appointment of an administrator of the Owner or Service Provider, or an administrator of the Owner or Service Provider is appointed; or
 - 6.1.1.3 the Owner or Service Provider enters into a compromise or arrangement with creditors; or

- 6.1.1.4 the Owner or Service Provider has a receiver, administrative receiver or manager appointed over all or any part of its assets or undertaking; or
- 6.1.1.5 the Owner or Service Provider is dissolved; or
- 6.1.2 if the Owner or Service Provider is an individual:
 - 6.1.2.1 the Owner or Service Provider enters into a compromise or arrangement with creditors; or
 - 6.1.2.2 the Owner or Service Provider is declared bankrupt; or
 - 6.1.2.3 the Owner or Service Provider dies; or
- 6.1.3 if the Owner or Service Provider is a partnership:
 - 6.1.3.1 any of the partners in the Owner or the Service Provider are declared bankrupt or enter into a compromise or arrangement with creditors; or
 - 6.1.3.2 the Owner or Service Provider is wound up or dissolved; or
 - 6.1.3.3 the Owner or Service Provider enters into a compromise or arrangement with creditors; or
 - 6.1.3.4 a partnership administration order is made in respect of the Owner or the Service Provider; or
- 6.1.4 any similar or analogous proceedings or event to those in clauses 6.1.1 to 6.1.3 above occurs in respect of the Owner or Service Provider within any jurisdiction outside England; or
- 6.1.5 the Owner or Service Provider ceases to carry on its business or the part of its business which relates to the Package; or
- 6.1.6 the Owner assigns its rights to the Intellectual Property Rights in the Material to a third party ("**Assignee**") and the Assignee fails, within 60 days of all parties' knowledge of such assignment, to continue escrow protection for the benefit of the Licensee by failing to enter into either:
 - 6.1.6.1 a novation agreement with the Licensee and NCC Group for the assumption of the Owner's rights and obligations under this Agreement by the Assignee on terms reasonably satisfactory to the Licensee; or
 - 6.1.6.2 a new escrow agreement with the Licensee for the Package which offers the Licensee substantially similar protection to that provided by this Agreement without significantly increasing the overall cost to the Licensee,

provided that if the Assignee offers to enter into a novation or new escrow agreement on terms reasonably satisfactory to the Licensee within 60 days of all parties' knowledge of the assignment and the Licensee fails to accept the Assignee's offer within 30 days of such offer being notified to the Licensee, there shall be no Release Event under this clause; or
- 6.1.7 the Owner or, where relevant, its agent, parent, subsidiary or associated company is in material breach of its obligations under the Licence Agreement or any maintenance agreement (including the FSA) entered into in connection with the Package and has failed to remedy such default as required by the terms of the Licence Agreement or such maintenance agreement (including the FSA); or

- 6.1.8 the Owner at any time unreasonably refuses to carry out, or to consent to the Licensee or its nominee carrying out, whether during or after the termination or expiry of the relevant Licence Agreement:
- 6.1.8.1 any of the Owner's obligations under the Licence Agreement (including after termination or expiry of the Licence Agreement, any obligation which was previously covered by the Licence Agreement); or
- 6.1.8.2 any Modification,
- in each case excluding the manufacture of entire Trains (such refusal to include any proposal by the Owner to the Licensee or its nominee to carry out any such works or services at an unreasonably high price); or
- 6.1.9 the carrying out of any rectification or other works or services pursuant to clause 21 (Right of the Purchaser to Authorise Work by Others) of the Licence Agreement or in any other circumstances where the Owner is failing to carry out its obligations under the Licence Agreement; or
- 6.1.10 termination (but only where as a result of breach of this Agreement by the Owner) or expiry of this Agreement in circumstances where it is not replaced immediately on substantially the same terms as this Agreement with the Licensee at substantially the same price for the Licensee; or
- 6.1.11 termination or expiry of the Licence Agreement; or
- 6.1.12 for the avoidance of doubt, should the Owner instruct NCC Group to release the Material to the Licensee at any time in a written format which is acceptable to NCC Group and which has been signed by an authorised officer of the Owner, NCC Group will do so in a timely manner without following the process set out in this clause 6. The Owner shall indemnify NCC Group fully against any claim brought against NCC Group by the Licensee or any third party for acting in accordance with this clause 6.1.12.
- 6.2 The Licensee must notify NCC Group of the Release Event specified in clause 6 by delivering to NCC Group a statutory or notarised declaration ("**Declaration**") made by an officer of the Licensee declaring that such Release Event has occurred, setting out the facts and circumstances of the Release Event, that the Licence Agreement and any maintenance agreement (including the FSA), if relevant, for the Package was still valid and effective up to the occurrence of such Release Event and exhibiting such documentary evidence in support of the Declaration as NCC Group shall reasonably require.
- 6.3 Upon receipt of a Declaration from the Licensee claiming that a Release Event has occurred:
- 6.3.1 NCC Group shall submit a copy of the Declaration to the Owner by courier or other form of guaranteed delivery; and
- 6.3.2 unless within 14 days after the date of despatch of the Declaration by NCC Group, NCC Group receives a counter-notice signed by a duly authorised officer of the Owner stating that in their view no such Release Event has occurred or, if appropriate, that the event or circumstance giving rise to the Release Event has been rectified as shown by documentation in support thereof,
- NCC Group will release the Material to the Licensee for its use for the Release Purposes.
- 6.4 Upon receipt of the counter-notice from the Owner under clause 6.3.2, NCC Group shall send a copy of the counter-notice and any supporting evidence to the Licensee by courier or other form of guaranteed delivery.

- 6.5 Upon receipt by the Licensee of the counter-notice from NCC Group or, in any event, within 90 days of despatch of the counter-notice by NCC Group, the Licensee may give notice to NCC Group that they wish to invoke the dispute resolution procedure under clause 7.
- 6.6 If, within 90 days of despatch of the counter-notice by NCC Group to the Licensee, NCC Group has not been informed by the Licensee that they wish the dispute resolution procedure under clause 7 to apply, the Declaration submitted by the Licensee will be deemed to be no longer valid and the Licensee shall be deemed to have waived their right to release of the Material for the particular reason or event specified in the original Declaration.
- 6.7 For the avoidance of doubt, where a Release Event has occurred under clauses 6.1.1 to 6.1.5 or 6.1.7 to 6.1.12, a subsequent assignment of the Intellectual Property Rights in the Material shall not prejudice the Licensee's right to release of the Material and its use for the Release Purposes.

7. Disputes

- 7.1 NCC Group shall notify the Owner of the Licensee's request for dispute resolution. Unless the Owner or the Licensee objects, NCC Group's Chief Executive Officer for the time being will appoint an Independent Expert to resolve the dispute. If the Owner or the Licensee objects to this appointment, they shall endeavour to appoint a mutually acceptable Independent Expert within 7 days of registering their objection. If they fail to appoint an Independent Expert within this 7 day period, NCC Group shall request that the President of The Law Society appoints an Independent Expert to resolve the dispute. Any appointment of an Independent Expert under this clause shall be binding upon the parties.
- 7.2 Within 5 working days of the appointment of the Independent Expert, the Owner and the Licensee shall each provide full written submissions to the Independent Expert together with all relevant documentary evidence in their possession in support of their claim.
- 7.3 The Independent Expert shall be requested to give a decision on the matter within 14 days of the date of referral or as soon as practicable thereafter and to send a copy of that decision to the Owner, Licensee and NCC Group. The Independent Expert's decision shall be final and binding on all parties and shall not be subject to appeal to a court in legal proceedings except in the case of manifest error.
- 7.4 If the Independent Expert's decision is in favour of the Licensee, NCC Group is hereby authorised to release and deliver the Material to the Licensee within 5 working days of the decision being notified by the Independent Expert to the parties.
- 7.5 The parties hereby agree that the costs and expenses of the Independent Expert shall be borne by the party against whom the decision of the Independent Expert is given.

8. Confidentiality

- 8.1 The Material shall remain at all times the confidential and intellectual property of its owner.
- 8.2 Subject to the terms of the Licence Agreement, in the event that NCC Group releases the Material to the Licensee, the Licensee shall be permitted to use the Material only for the Release Purposes, and otherwise as set out in the relevant Licence Agreement.
- 8.3 NCC Group agrees to keep all Confidential Information relating to the Material and/or the Package that comes into its possession or to its knowledge under this Agreement in strictest confidence and secrecy. NCC Group further agrees not to make use of such information and/or documentation other than for the purposes of this Agreement and,

unless the parties should agree otherwise in writing, will not disclose or release it other than in accordance with the terms of this Agreement.

9. Intellectual Property Rights

- 9.1 The release of the Material to the Licensee will not act as an assignment of any Intellectual Property Rights that the Owner or any third party possesses in the Material.
- 9.2 The Intellectual Property Rights in the Integrity Testing report and any Full Verification report shall remain vested in NCC Group. The Owner and the Licensee shall each be granted a non-exclusive right and licence to use such report for the purposes of this Agreement and their own internal purposes only.

10. Integrity Testing and Full Verification

- 10.1 NCC Group shall bear no obligation or responsibility to any party to this Agreement or person, firm, company or entity whatsoever to determine the existence, relevance, completeness, accuracy, operation, effectiveness, functionality or any other aspect of the Material received by NCC Group under this Agreement.
- 10.2 As soon as practicable after the Material has been deposited with NCC Group, NCC Group shall apply its Integrity Testing processes to the Material.
- 10.3 Any party to this Agreement shall be entitled to require NCC Group to carry out a Full Verification. Subject to clause 10.4, NCC Group's prevailing fees and charges for the Full Verification processes and all reasonable expenses incurred by NCC Group in carrying out the Full Verification processes shall be payable by the requesting party.
- 10.4 If the Material fails to satisfy NCC Group's Full Verification tests as a result of being defective or incomplete in content, NCC Group's fees, charges and expenses in relation to the Full Verification tests shall be paid by the Owner.
- 10.5 Should the Material deposited fail to satisfy NCC Group's Integrity Testing or Full Verification tests under clauses 10.2 or 10.3, the Owner shall, within 14 days of the receipt of the notice of test failure from NCC Group, deposit such new, corrected or revised Material as shall be necessary to ensure its compliance with its warranties and obligations in clause 2. If the Owner fails to make such deposit of the new, corrected or revised Material, NCC Group will issue a report to the Licensee detailing the problem with the Material as revealed by the relevant tests.

11. NCC Group's Liability

- 11.1 Nothing in this clause 11 excludes or limits the liability of NCC Group for:
- 11.1.1 fraud or fraudulent misrepresentation;
 - 11.1.2 death or personal injury caused by NCC Group's (or its employees', agents' or sub contractors') negligence; or
 - 11.2.3 any matter for which it is not permitted by law to exclude or limit, or to attempt to exclude or limit, its liability.

Without prejudice to clauses 11.1.1 to 11.1.3 (inclusive), the following provisions set out the entire financial liability of NCC Group (including any liability for the acts or omissions of its employees, agents and sub-contractors) arising out of or in connection with this Agreement, whether in contract, tort, misrepresentation, under statute or otherwise, howsoever caused including (without limitation) by negligence and also including (without limitation) any liability arising from a breach of, or a failure to perform or defect or delay in performance of, any of NCC Group's obligations under this Agreement.

- 11.2 NCC Group shall not be liable for any loss or damage caused to the other parties except to the extent that such loss or damage is caused by the negligent acts or negligent omissions of or a breach of any contractual duty by NCC Group, its employees, agents or sub-contractors in performing its obligations under this Agreement and in such event NCC Group's maximum aggregate liability arising out of or in connection with this Agreement, whether in contract, tort, misrepresentation, under statute or otherwise, howsoever caused including (without limitation) by negligence and also including (without limitation) any liability arising from a breach of, or a failure to perform or defect or delay in performance of, any of NCC Group's obligations under this Agreement, shall be limited to £2,500,000 (two million five hundred thousand pounds).
- 11.3 Subject to clause 11.1, NCC Group shall not be liable to the other parties for any:
- 11.3.1 indirect, consequential and/or special loss or damage;
 - 11.3.2 loss of profit (direct or indirect);
 - 11.3.3 loss of revenue, loss of production or loss of business (in each case whether direct or indirect);
 - 11.3.4 loss of goodwill, loss of reputation, or loss of opportunity (in each case whether direct or indirect);
 - 11.3.5 loss of anticipated saving or loss of margin (in each case whether direct or indirect); and/or
 - 11.3.6 loss or damage arising out of any failure by the Owner to keep full and up-to-date back-ups and security copies of any Materials delivered under this Agreement,
- arising out of or in connection with this Agreement, whether in contract, tort, misrepresentation, under statute or otherwise, howsoever caused including (without limitation) by negligence and also including (without limitation) any liability arising from a breach of, or a failure to perform or defect or delay in performance of, any of NCC Group's obligations under this Agreement.
- 11.4 NCC Group shall not be liable in any way to the Owner or the Licensee for acting in accordance with the terms of this Agreement and specifically (without limitation) for acting upon any notice, written request, waiver, consent, receipt, statutory declaration or any other document furnished to it pursuant to and in accordance with this Agreement.
- 11.5 NCC Group shall not be required to make any investigation into and shall be entitled in good faith without incurring any liability to the Owner or the Licensee to assume (without requesting evidence thereof) the validity, authenticity, veracity and due and authorised execution of any documents, written requests, waivers, consents, receipts, statutory declarations or notices received by it in respect of this Agreement.
12. **Indemnity**
- 12.1 Save for any claim falling within the provisions of clause 11.1 or 11.2, the Owner and the Licensee jointly and severally agree at all times to indemnify and hold harmless NCC Group in respect of all of its legal and all other costs, fees and expenses incurred directly or indirectly as a result of being brought into or otherwise becoming involved in any form of dispute resolution proceedings or any litigation of any kind between the Owner and the Licensee in relation to this Agreement to the extent that this Agreement does not otherwise provide for reimbursement of such costs.
- 12.2 The Owner shall assume all liability and shall at all times indemnify and hold harmless NCC Group and its officers, agents, sub-contractors and employees from and against any and all liability, loss, damages, costs, legal costs, professional and other expenses and

any other liabilities of whatever nature, awarded against or agreed to be paid or otherwise suffered, incurred or sustained by NCC Group, whether direct, indirect or consequential as a result of or in connection with any claim by any third party(s) for alleged or actual infringement of Intellectual Property Rights arising out of or in connection with all and any acts or omissions of NCC Group in respect of the Material as contemplated under this Agreement.

13. Term and Termination

- 13.1 This Agreement shall continue until terminated in accordance with this clause 13.
- 13.2 If the Owner or the Licensee, as the case may be, fails to pay an invoice addressed to it for services under this Agreement within 30 days of its issue, NCC Group reserves the right to give that party written notice to pay the outstanding invoice within 30 days. If the Licensee has not paid its invoice by the expiry of the 30 day notice period, this Agreement will automatically immediately terminate. If the Owner has not paid its invoice by the expiry of the 30 day notice period, NCC Group will give the Licensee a period of 15 days to pay the Owner's invoice. If the Owner's invoice has not been paid by the expiry of the 15 day optional payment period given to the Licensee, this Agreement will automatically immediately terminate. Any amounts owed by the Owner but paid by the Licensee will be recoverable by the Licensee direct from the Owner as a debt and, if requested, NCC Group shall provide appropriate documentation to assist in such recovery.
- 13.3 Upon termination under the provisions of clause 13.2, for 30 days from the date of termination NCC Group will make the Material available for collection by the Owner or its agents from the premises of NCC Group during office hours. After such 30 day period NCC Group will destroy the Material.
- 13.4 Notwithstanding any other provision of this clause 13, NCC Group may terminate this Agreement by giving 30 days written notice to the Owner and the Licensee. In that event, the Owner and the Licensee shall appoint a mutually acceptable new custodian on similar terms and conditions to those contained herein. If a new custodian is not appointed within 14 days of delivery of such notice, the Owner or the Licensee shall be entitled to request the President for the time being of the British Computer Society (or successor body) to appoint a suitable new custodian upon such terms and conditions as he/she shall require. Such appointment shall be final and binding on the Owner and the Licensee. If NCC Group is notified of the new custodian within the notice period, NCC Group will forthwith deliver the Material to the new custodian. If NCC Group is not notified of the new custodian within the notice period, NCC Group will return the Material to the Owner.
- 13.5 The Licensee may terminate this Agreement at any time by giving written notice to NCC Group. Upon such termination, NCC Group will return the Material to the Owner.
- 13.6 If all of the Intellectual Property Rights in the Material have been assigned to a third party and the proviso in clause 6.1.6 applies such that there has been no Release Event under that clause, NCC Group shall be entitled to terminate this Agreement immediately by written notice to the Owner and the Licensee and upon such termination, unless otherwise instructed by the Owner or the Assignee, NCC Group shall destroy the Material.
- 13.7 Subject to clause 13.8, the Owner may only terminate this Agreement with the written consent of the Licensee.
- 13.8 This Agreement shall automatically immediately terminate upon release of the Material to the Licensee in accordance with clause 6.
- 13.9 If this Agreement is superseded and replaced by a new agreement in respect of the Material, this Agreement shall, upon the coming into force of the new agreement, automatically terminate. The relevant party or parties shall request NCC Group to either

transfer the Material to the new agreement or ask the owner under the new agreement to deposit new material. If new material is deposited, upon its receipt, NCC Group shall, unless otherwise instructed, destroy the Material.

- 13.10 The provisions of clauses 1, 3.2, 3.3, 5, 8, 9, 10.1, 11, 12, 13.10 to 13.12 (inclusive) and 14 shall continue in full force after termination of this Agreement and the provisions of clauses 6.1.10 and 7 shall continue in full force and effect until such time as the Material has been released to the Licensee by NCC Group.
- 13.11 On and after termination of this Agreement, the Owner and/or the Licensee (as appropriate) shall remain liable to NCC Group for payment in full of any fees and interest which have become due but which have not been paid as at the date of termination.
- 13.12 The termination of this Agreement, however arising, shall be without prejudice to the rights accrued to the parties prior to termination.

14. **General**

- 14.1 A party shall notify the other parties to this Agreement, within 30 days of its occurrence, of any of the following:
 - 14.1.1 a change of its name, registered office, contact address or other contact details; and
 - 14.1.2 any material change in its circumstances that may affect the validity or operation of this Agreement.
- 14.2 Within 14 days of any assignment or transfer by the Owner of any part of its Intellectual Property Rights in the Material, the Owner shall notify:
 - 14.2.1 NCC Group and the Licensee of such assignment and the identity of the Assignee; and
 - 14.2.2 the Assignee of the provisions of clause 6.1.6.
- 14.3 The formation, existence, construction, performance, validity and all other aspects of this Agreement shall be governed by and construed in accordance with the laws of England and the parties submit to the exclusive jurisdiction of the English courts.
- 14.4 This Agreement, together with the Order Form and any relevant NCC Group standard terms and conditions represent the whole agreement relating to the escrow arrangements between NCC Group and the other parties for the Package and shall supersede all prior agreements, discussions, arrangements, representations, negotiations and undertakings. In the event of any conflict between any of these documents, the terms of this Agreement shall prevail.
- 14.5 Unless the provisions of this Agreement otherwise provide, any notice or other communication required or permitted to be given or made in writing hereunder shall be validly given or made if delivered by hand or courier or if despatched by first class recorded delivery (airmail if overseas) addressed to the address specified for the parties in this Agreement (or such other address as may be notified to the parties from time to time) or if sent by facsimile message to such facsimile number as has been notified to the parties from time to time and shall be deemed to have been received:
 - (i) if delivered by hand or courier, at the time of delivery;
 - (ii) if sent by first class recorded delivery (airmail if overseas), 2 business days after posting (6 days if sent by airmail);

- (iii) if sent by email, at the time of receipt by the sender of a "delivered" confirmation (provided that the sender shall not be required to produce a "read" confirmation).
- 14.6 The Owner and the Licensee shall not assign, transfer or subcontract this Agreement or any rights or obligations thereunder without the prior written consent of the other parties.
- 14.7 NCC Group shall be entitled to transfer or assign this Agreement upon written notice to both the Owner and the Licensee.
- 14.8 This Agreement shall be binding upon and survive for the benefit of the successors in title and permitted assigns of the parties.
- 14.9 If any provision of this Agreement is declared too broad in any respect to permit enforcement to its full extent, the parties agree that such provision shall be enforced to the maximum extent permitted by law and that such provision shall be deemed to be varied accordingly. If any provision of this Agreement is found by any court, tribunal or administrative body of competent jurisdiction to be wholly or partly illegal, invalid, void or unenforceable, it shall, to the extent of such illegality, invalidity or unenforceability, be deemed severable and the remaining part of the provision and the rest of the provisions of this Agreement shall continue in full force and effect.
- 14.10 Save as expressly provided in this Agreement, no amendment or variation of this Agreement shall be effective unless in writing and signed by a duly authorised representative of each of the parties to it.
- 14.11 The parties shall not be liable to each other or be deemed to be in breach of this Agreement by reason of any delay in performing, or failure to perform, any of their obligations under this Agreement if the delay or failure was for a reason beyond that party's reasonable control (including, without limitation, fire, flood, explosion, epidemic, riot, civil commotion, any strike, lockout or other industrial action, act of God, war or warlike hostilities or threat of war, terrorist activities, accidental or malicious damage, or any prohibition or restriction by any governments or other legal authority which affects this Agreement and which is not in force on the date of this Agreement). A party claiming to be unable to perform its obligations under this Agreement (either on time or at all) in any of the circumstances set out above must notify the other parties of the nature and extent of the circumstances in question as soon as practicable. If such circumstances continue for more than six (6) months, any of the other parties shall be entitled to terminate this Agreement by giving one month's notice in writing.
- 14.12 No waiver by any party of any breach of any provisions of this Agreement shall be deemed to be a waiver of any subsequent or other breach and, subject to clause 6.6, no failure to exercise or delay in exercising any right or remedy under this Agreement shall constitute a waiver thereof.
- 14.13 This Agreement is not intended to create any right under the Contracts (Rights of Third Parties) Act 1999 which is enforceable by any person who is not a party to this Agreement and the rights of any third party under the said act are hereby expressly excluded.
- 14.14 This Agreement may be executed in any number of counterparts and by different parties in separate counterparts. Each counterpart when so executed shall be deemed to be an original and all of which together shall constitute one and the same agreement.

Signed for and on behalf of **SIEMENS MOBILITY LIMITED**

Name:

Position:

Signed for and on behalf of **NCC GROUP ESCROW LIMITED**

Name:

Position:

The common seal of **LONDON**)
UNDERGROUND LIMITED was hereunto)
affixed in the presence of:)
)
)

Signature of authorised signatory

Name of authorised signatory

Appendix 1

The Package

The software package known as DTUP Siemens Technology – Rolling Stock or any other name(s) as may be given to it by the Owner from time to time.

Appendix 2**NCC Group's Fees**

	DESCRIPTION	OWNER	LICENSEE
1.	Annual Fee (payable on completion of this Agreement and in advance of each anniversary thereafter)	Nil	100%
2.	Scheduled Update Fee (2nd and subsequent scheduled deposits in any one year, payable on completion of this Agreement and in advance of each anniversary thereafter)	Nil	100%
3.	Unscheduled Update Fee (per unscheduled deposit)	Nil	100%
4.	Release Fee (plus NCC Group's reasonable expenses)	Nil	100%

Additional fees will be payable to NCC Group by the Licensee (unless otherwise agreed between the parties) for the following where applicable:

- Storage Fee for deposits in excess of 1 cubic foot;
- Any novation or replacement of this Agreement at the request of the Owner or the Licensee;
- Integrity Testing Fee for deposits consisting of more than 5 media items.

Appendix 3

Licence Agreement¹⁹

¹⁹ Note: Insert full details of the agreement related to the Package.

Part B: Corporate IPR

LUL Standard 1-382 – Corporate IPR: <https://ihsmarkit.com/permission/lul-standards/index.html>

1. The TfL and London Underground Roundel, including the following registered trademarks:

Country	Registration/ Application	Trademark	Class
UK	1321443	BLANK ROUND	39
UK	1094664	ROUND & DEVICE	6 16 19 21 26 28
UK	586249	ROUND	16
UK	2236110	UNDERGROUND & ROUND	3 16 18 32 42
UK	1094661	UNDERGROUND & ROUND DEVICE	24 25
UK	2224385	UNDERGROUND AND ROUND	25
UK	1321442	UNDERGROUND ROUND	39
UK	1178433	BAR & CIRCLE DEVICE	12
CTM	1101336	LONDON UNDERGROUND & ROUND	14 16 18 25 32
CTM	299206	ROUND DEVICE	16 25 28 39
CTM	814004	ROUND DEVICE & UNDERGROUND	18 25 42

2. The New Johnston typeface of design type NJBook98, NJLight98 and NJMedium98 (the New Johnston Typeface).
3. The London Underground Tube Map.
4. The following registered trademarks:

Country	Registration/ Application	Trademark	Class
UK	1527316	BAKERLOO	39
UK	1527393	JUBILEE	39
UK	2153485	MIND THE GAP	16 25 42
UK	1527319	THE CENTRAL LINE	39
UK	1527391	THE CIRCLE LINE	39
UK	1527429	THE DISTRICT LINE	39
UK	1527308	THE METROPOLITAN LINE	39
UK	1527388	THE NORTHERN LINE	39
UK	1527310	THE PICCADILLY LINE	39
UK	1527320	THE TUBE	39
UK	1527321	THE UNDERGROUND	39
UK	1527312	THE VICTORIA LINE	39
UK	2216375	TRAMLINK AND DEVICE	6 16 25 39
UK	1454868	DEVICE ONLY	16
UK	1454869	DEVICE ONLY	35
UK	1454870	DEVICE ONLY	37
UK	1454871	DEVICE ONLY	39
UK	1454872	DEVICE ONLY	42
UK	1457590	LONDON UNDERGROUND	16
UK	2251158	THE TUBE/TUBE	3 9 14 16 18 21
UK	2251513	TFL/TFL	6 9 12 16 19 35 36 37 39
CTM	1580992	ALL ZONES	16 21 25
CTM	448571	LONDON UNDERGROUND	14 16 25 28
CTM	1677277	LOST PROPERTY	3 14 16
CTM	1677814	LOST PROPERTY	18 25 30
CTM	299578	UNDERGROUND	16 25 28

5. The following unregistered trademarks:
- The Hammersmith & City Line
 - The Waterloo & City Line
 - The East London Line

SCHEDULE 24**Foreign Exchange****Part A: Interim Milestone Payments****Initial APB Bond Amount**

██████████

Trains and Equipment

	Milestone	Milestone Payment (£)
1.	Signature of this Agreement including satisfaction of all conditions precedent including an Advance Payment Bond in full force and effect with an initial APB Bond Amount equal to the proposed Milestone Payment.	██████████
1a.	All updated or new Plans and strategies, including the Train Maintenance Regime, as identified in the Contract Documents that are required to have been submitted and Approved on or prior to the date stipulated as the Key Programme Date for this Milestone 1a have been submitted and Approved.	█
2.	(1) Mobilisation of the Manufacturer's project team (including the appointment of those Key Posts required to be appointed by the end of the Concept Design Phase); and (2) completion of the Concept Design as evidenced by Assurance of the Concept Design by the Purchaser in accordance with schedule 17 (Design Management).	██████████
2a.	Approval of the Train/ PDP Interface Control Documents by the Purchaser in support of the Preliminary Design Phase	█
3.	Approval of the Train/ PDP Interface Control Documents by the Purchaser.	█
3a.	Completion of the Final Design Phase as evidenced by Assurance of the Concept Design by the Purchaser in accordance with schedule 17 (Design Management).	██████████
4.	Commencement of the assembly of the first and second Trains in the Base Order Fleet, and confirmation that all necessary Manufacturing Tooling, materials, equipment and labour are available as required.	██████████
5.	Completion of the assembly of the first and second Trains in the Base Order Fleet and completion of Routine Testing in accordance with schedule 7 (Testing and Inspection).	██████████
5a.	Test Track Facilities fully prepared and made available for Project Delivery Partners integration equipment	█

	installation.	
6.	Commencement of the assembly of the third Train in the Base Order Fleet, and evidence that all necessary Manufacturing Tooling, materials, equipment and labour are available as required to continue the manufacture of the Base Order Fleet.	
7.	Issue of an Equipment Acceptance Certificate in relation to each Train Driving Simulator for the Base Order.	
8.	Issue of a QPAC or PAC (whichever occurs first) in relation to each Train in the Base Order Fleet.	
9.	Issue of Fleet Acceptance Certificate in relation to the Base Order Fleet.	

2. Total Contract Price

[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED] [REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED] [REDACTED] [REDACTED]	
[REDACTED] [REDACTED]	

Part B: Financial Close Protocol

Option A: Price and Milestones adjusted to a 100 per cent GBP Price – Bloomberg

- For the foreign exchange indexation and hedging process, the Manufacturer will use one computer with high-speed connections to the internet and Bloomberg.
- Milestone Payments included in the Financial Close Spreadsheet (FCS) are listed in (i) the relevant base currency supplied by the Manufacturer, being EUR, and (ii) the forward rates (EUR/GBP) as interpolated from the Bloomberg FRD screen/forward source CBKF (see attached FCS). Within the first Business Hour that occurs after execution of the Agreement, forward rates from the Bloomberg FRD screenshots are taken for all the periods to which the foreign cash flows relate. Bloomberg Source Details are:
 - Screen: FRD
 - Currency Pairs: EUR/GBP
 - Spot Source: BFIX
 - Forward Source: CBKF
 - Bid-Ask: Bid rates, i.e. buying strip according to the relevant dates in the Schedule of Milestones in schedule 10 (Milestones and Security).

There will be a separate forward rate used for each Milestone Payment.

The dates within the FCS reflect the scheduled dates for the Milestone Payments rather than the first day of the month. The identified dates have been checked to ensure that they are Working Days.

Examples of a screenshot for EUR/GBP to be used as a basis for the forward rates to be included in the FCS:



- The screenshots will be taken with the "Auto Refresh" function disabled and will be sent to the Purchaser for approval. The Manufacturer reserves the right to propose revised

screenshots if the rates have moved between the moment of the screenshots having been made, and the moment of receipt of the Purchaser's approval. In the latter case steps 2, 3 and 4 would re-start.

4. The Manufacturer shall also provide the Purchaser with the best quotation for forward rates from three of its banks. This quotation shall be provided concurrently with the screenshots in step 2.
5. The Purchaser shall have 15 minutes to review and approve or reject the rates or alternatively accept the rates from the bank quotation at step 3. If the Purchaser does not approve the rates within 15 minutes the Manufacturer shall re-run the rates and follow step 2 onwards.
6. If the rates are approved by the Purchaser then these rates are applied to the FCS and the new Milestone Payments in GBP are calculated. The Bid Price will be indexed upward or downward for the variation in the EUR/GBP exchange rates. The FCS includes the foreign content and itemizes the actual component value in EUR (tab "Bid Milestones") and in GBP (tab "Bid Milestones") that are used in Part A: (Interim Milestone Payments) of this schedule 24. The foreign exchange indexation shall be applied once. The indexation shall be calculated by applying the spot rates and forward rates as per Bloomberg as described in step 3 or the bank quotation as described in step 4, to the GBP equivalent in the next full Business Hour that occurs on or after execution of the Agreement (or as by updating the FCS (tab "Bid Milestones")).
 - (a) Manufacturer will update tab "Bid Milestones" with the agreed Bloomberg FX or bank quotation data.
 - (b) The total price in GBP equivalent will be updated automatically in tab "Bid Milestones".
 - (c) The calculation of Total Contract Price for Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) will be updated automatically in tab "Sch 1 Contract Price".
 - (d) The output referred to in (c) above will be in a format such that it can be:
 - (i) used to insert the Initial APB Bond Amount in paragraph 1.1 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);
 - (ii) used to insert the Maximum IO Required Bond Amount in paragraph 1.1 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security);
 - (iii) inserted into Appendix 1 (Schedule of Milestones) to Part B: (Milestones) of schedule 10 (Milestones and Security), including column (4), in order to determine the relevant increases and decreases to the APB Bond Amount; and
 - (iv) inserted in Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) of this Agreement.

Any manifest error in the spreadsheet or the transfer of exchange rates from the screenshots into the spreadsheet will be corrected by mutual agreement between Manufacturer and the Purchaser.

7. If the rates are not approved and the Purchaser does not accept the bank quotation as an alternative then the Purchaser will advise the Manufacturer to either re-run Bloomberg forward rates in point 2 (and subsequently follow steps 2 to 9 again) or will advise that it wishes to invoke its hedging rights – see Process on Hedging Rights.

8. The FCS with the new and approved rates and revised GBP values will be sent to the Purchaser for approval. The Purchaser accepts it cannot reject these at this point due to disagreements with the foreign exchange rates used unless a manifest error has been made.
9. If approved, an updated definition of Train Capital Cost, paragraph 1.1 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security), paragraph 1.1 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security), Appendix 1 (Schedule of Milestones) to Part B: (Milestones) of schedule 10, Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) and Part A (Interim Milestone Payments) of schedule 24 (Financial Close Protocol) with amended prices will be sent to the Purchaser for approval.

A number of dry runs of the process have taken place at times to be agreed between the Parties.

A detailed step by step financial close process, based on the Financial Close Protocol will be agreed between the Parties prior to Execution of the Agreement.

In this Part B: of this schedule 24, the **"Financial Close Spreadsheet"** shall mean the spreadsheet referred to by such name and initialled by the Parties as at the date of this Agreement.

Option B: Hedging Rights Process

1. The Purchaser shall procure that TfL confirm that it elects to utilise its hedging powers.
2. The FCS shall be updated and sent to the Purchaser for approval.
3. The Purchaser either approves the FCS or if not then the Purchaser informs Manufacturer of any discrepancies in the FCS.
4. If approved, an updated definition of Train Capital Cost, paragraph 1.1 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security), paragraph 1.1 of Part A: (Advance Payment Bond) of schedule 10 (Milestones and Security), Appendix 1 (Schedule of Milestones) to Part B: (Milestones) of schedule 10 and Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 (Milestones and Security) with amended prices will be sent to the Purchaser for approval. These will include Milestone Payments in Part A (Interim Milestone Payments) of this schedule 24 split into the relevant currencies to be paid by the Purchaser. The Manufacturer will invoice any VAT payable on the foreign currencies in GBP at the prevailing rate at the VAT point.

SCHEDULE 25

Whole Line Options

1. INTRODUCTION

This schedule sets out the amendments that are to be made to this Agreement on the exercise of a Whole Line Option, on the Whole Line Option Notice Exercise Date following the issue by the Purchaser of a Whole Line Option Notice. Save as amended by this schedule, and as set out in this Agreement, all other provisions of this Agreement apply to each Whole Line Option (making any necessary changes) regardless of whether they are referred to specifically in this schedule 25.

Amendments to clauses that are Immediately Effective Clauses apply to the relevant Whole Line Option on and from the Whole Line Option Notice Exercise Date and all other amendments take effect on the Commencement Date relating to the relevant Whole Line Option.

2. CLAUSE 2 (COMMENCEMENT AND CONDITIONS PRECEDENT)

2.1 In relation to the exercise of each Whole Line Option, the Manufacturer shall, subject to clause 2.5, provide to the Purchaser the Manufacturer conditions precedent set out in clause 2.3 with the following amendments:

- (a) clause 2.3(a): a re-confirmation of the Guarantee in a form satisfactory to the Purchaser reflecting the effect of the exercise of the relevant Whole Line Option on terms reasonably satisfactory to the Purchaser;
- (b) clause 2.3(b): a new Advance Payment Bond on the basis that the Initial APB Bond Amount for the relevant Whole Line Option is:
 - (i) for the Bakerloo Line Base Order, [REDACTED];
 - (ii) for the Central Line Base Order, [REDACTED] and
 - (iii) for the Waterloo & City Line Base Order, [REDACTED];
- (c) clause 2.3(d): a new Escrow Agreement in relation to the Escrow Material relating to the relevant Whole Line Option;
- (d) clause 2.3(e): a certified copy of the documents referred to in that clause with references in paragraph (i) to "this Agreement" replaced with references to "the relevant Whole Line Option";
- (e) clause 2.3(f): a further legal opinion in relation to the Guarantor with respect to the reconfirmation of the Guarantee;
- (f) clause 2.3(g): the Manufacturer has provided evidence that the insurances that the Manufacturer was required to take out and maintain for the Base Order under clause 2.3(g) now cover the relevant Whole Line Option and has provided a new letter of undertaking in relation to those insurances for that Whole Line Option in the form set out in Part D: (Broker's Letter of Undertaking) to schedule 13 (Insurance);
- (g) clause 2.3(h): population, pursuant to clause 2.7(e) of paragraph 1.1 of Part A: (Initial Advance Payment Bond), Appendix 1 to Part B: (Schedule of Milestones) and Appendix 2 to Part B: (Total Contract Price) of schedule 10 (Milestones and Security) relating to the relevant Whole Line Option as amended by appendices 2 and 3 to this schedule 25; and

- (h) an additional condition precedent clause 2.3(j): provision of the final WLO Project Programme in relation to the relevant Whole Line Option.
- 2.2 Clause 2.6: shall apply in relation to each Whole Line Option amended such that once the Purchaser is satisfied for each Whole Line Option that each of the conditions precedent set out in clause 2.3 (as amended by this schedule 25) has been satisfied or waived, the Purchaser shall issue to the Manufacturer a Certificate of Commencement which shall specify the Commencement Date for the relevant Whole Line Option.
- 2.3 Clause 2.7 shall be amended in relation to each Whole Line Option as follows:
- (a) the Parties agree that the prices listed in paragraph 1 of Part A:, Part B: or Part C: (as applicable) of Appendix 8 to this schedule 25 (the **"WLO Interim Milestone Payments"**) will, subject only to adjustment in accordance with the application of the Financial Close Protocol, become the Milestone Payments, the APB Bond Amounts and the Total Contract Price to be set out in the relevant paragraph 2.1(b), and the relevant Tables in Appendix 2 and Appendix 3 to this schedule 25 for the Whole Line Option that is being exercised;
 - (b) the Manufacturer agrees that within the first Business Hour following the relevant Whole Line Option Notice Exercise Date for the Whole Line Option, the Manufacturer shall complete steps 1 to 7 of the Financial Close Protocol;
 - (c) if the Purchaser provides the approvals in accordance with step 4 of the Financial Close Protocol, the Manufacturer shall complete all steps required pursuant to the Financial Close Protocol up to and including the completion of the Exchange Forward Rate Contracts;
 - (d) the Purchaser agrees to comply with its obligations pursuant to the Financial Close Protocol;
 - (e) following completion of the Exchange Forward Rate Contracts, the relevant paragraph of the definition of Train Capital Cost shall be updated and the relevant paragraph 2.1(b), and the relevant Tables in Appendix 2 and Appendix 3 to this schedule 25 shall be populated by the Manufacturer Contract Manager and the Purchaser Contract Manager with the final Milestone Payments (being the WLO Interim Milestone Payments as adjusted by the application of the Financial Close Protocol); and
 - (f) if the Purchaser refuses consent pursuant to step 5 of the Financial Close Protocol the process shall be suspended and the Manufacturer shall not undertake the Exchange Forward Rate Contracts. Unless the Purchaser gives notice to the Manufacturer that it wishes to exercise Option B (Hedging Rights Process) of the Financial Close Protocol with effect that TfL elects to utilise its hedging powers (in which case steps 1 to 4 of Option B of the Financial Close Protocol shall apply), the Manufacturer shall restart the Financial Close Protocol at any time requested by the Purchaser during Business Hours and the process set out in clauses 2.7(c) to 2.7(e) shall be repeated.
- 2.4 Clause 2.9 shall be amended as follows:

Unless all of the conditions precedent in clauses 2.3 are satisfied or waived in writing by the Purchaser on or before the Scheduled Commencement Date in relation to the relevant Whole Line Option (or such later date as the Parties may agree), the relevant Whole Line Option shall be cancelled and each Party shall bear their own costs in connection with the relevant Whole Line Option before such cancellation.

3. **CLAUSE 3 (REPRESENTATIONS AND WARRANTIES)**

The Parties agree that the representations and warranties set out in clause 3.1 shall be deemed to be repeated by the Manufacturer on the Commencement Date in relation to the relevant Whole Line Option and on each date the Manufacturer receives a WLO Additional Trains Option Notice.

4. **CLAUSE 6 (BASE ORDER AND OPTIONS)**

4.1 Clause 6.1: depending on which Whole Line Option is exercised, the provisions of clause 6.1 shall apply to the relevant Whole Line Option with references to **"Base Order"** being read as **"WLO Base Order"** and the relevant WLO Base Order shall comprise:

(a) Bakerloo Line Base Order

- (i) 36 Bakerloo Line Trains;
 - (ii) the Bakerloo Line Equipment; and
 - (iii) supplements to the Technical Documents for the Bakerloo Line Trains,
- as may be amended by the quantities specified by the Purchaser in the relevant Whole Line Option Notice.

(b) Central Line Base Order

- (i) 89 Central Line Trains;
 - (ii) the Central Line Equipment; and
 - (iii) supplements to the Technical Documents for the Central Line Trains,
- as may be amended by the quantities specified by the Purchaser in the relevant Whole Line Option Notice.

(c) Waterloo & City Line Base Order

- (i) 5 Waterloo & City Line Trains;
 - (ii) the Waterloo & City Line Equipment; and
 - (iii) supplements to the Technical Documents for the Waterloo & City Line Trains,
- as may be amended by the quantities specified by the Purchaser in the relevant Whole Line Option Notice.

4.2 Clause 6.3:

- (a) on the exercise of a Whole Line Option, the Purchaser shall have the option to require the Manufacturer to re-configure any Train Driving Simulator for training on the line relating to that Whole Line Option, and subsequently keep that Train Driving Simulator up to date in accordance with the requirements of clause 6.3(e). If the Purchaser wishes to exercise this right, it shall set this out in the relevant Whole Line Option Notice.
- (b) If the Purchaser requires the Manufacturer to re-locate a Train Driving Simulator to another Designated Depot, or any other location which the Purchaser may specify,

as a result of the re-configuration in paragraph 4.2(a) above, the Manufacturer shall do so at the Purchaser's cost.

- 4.3 Clause 6.5: clause 6.5(a) shall be amended to require the Manufacturer to supply a supplement to each of the Manuals for the relevant Whole Line Option in sufficient time for them to have received Approval no later than 12 months before Provisional Acceptance of the first Train to be Accepted in the relevant Fleet, in accordance with schedule 28 (Technical Information).

5. **CLAUSE 7 (MANUFACTURER'S GENERAL OBLIGATIONS)**

- 5.1 Clause 7.11: references to Purchaser Depot Works in this Agreement shall be to the Bakerloo Line Purchaser Depot Works, the Central Line Purchaser Depot Works and/or the Waterloo & City Line Purchaser Depot Works as the case may be, depending on the relevant Whole Line Option to which the Purchaser Depot Works relate and in each case as set out in Appendix 1 to this schedule 25.

- 5.2 Clause 7.15: the obligations of the Manufacturer in this clause shall apply to each WLO Base Order in the same way as in relation to the Base Order.

- 5.3 Clause 7.17: The requirements for the Manufacturer to detect and inform the Purchaser of any LUL Operating Conditions shall apply separately and equally for each Fleet and Whole Line Option.

6. **CLAUSE 8 (DOCUMENTATION)**

Clause 8.3: clause 8.3 shall apply to each Whole Line Option save that the Manufacturer shall provide the final WLO Key Programme Dates in relation to any Whole Line Option to the Purchaser no later than the Whole Line Option Notice Exercise Date and, once provided, all references to "Key Programme Dates" shall be interpreted in relation to each Whole Line Option as references to the relevant "WLO Key Programme Dates".

7. **CLAUSE 10 (DESIGN AND MOCK-UPS)**

- 7.1 Clause 10.4: The requirements for the Manufacturer to build mock-ups (including a Saloon Mock-up for each relevant Whole Line Option) shall apply separately for each Whole Line Option to the extent they are determined to be required by the Purchaser as part of the exercise of the relevant Whole Line Option pursuant to the consultation process set out in clause 6.10(h).

- 7.2 Clause 10.6: If, following the consultation in clause 6.10(k), the Purchaser wishes to exercise its right to incorporate Hybrid Cooling for the relevant Whole Line Option, then it shall set this out in the relevant Whole Line Option Notice. Following exercise of this right by the Purchaser, clause 10.6 and Appendix 2 to schedule 17 (Design Management) shall apply, mutatis mutandis, to the relevant Whole Line Option, and the Purchaser shall be entitled to submit a Purchaser Change Notice to the Manufacturer pursuant to clause 10.6(c).

8. **CLAUSE 12 AND SCHEDULE 4 (TRAINING)**

The Manufacturer shall, within six (6) months of the Commencement Date for each Whole Line Option, submit to the Purchaser for Approval a training programme in accordance with paragraph 3 of schedule 4 (and this shall be the "**Training Programme**" for the relevant Whole Line Option) and the rest of schedule 4 shall apply to each Whole Line Option.

9. **CLAUSE 13 (TRAIN MAINTENANCE REGIME)**

Clause 13: the Manufacturer shall provide to the Purchaser for Approval, not less than six (6) months before the intended date for Pre-Provisional Acceptance of the first WLO Train as set out in the relevant WLO Key Programme Dates, a rolling stock train maintenance regime (including the Train Maintenance Plan) which shall demonstrate how the Purchaser shall maintain the WLO Trains and WLO Equipment in the relevant Designated Depots (or, where Equipment is located elsewhere, at that location) in order to achieve the required levels of performance throughout the life of the WLO Trains and WLO Equipment. Once such Train Maintenance Regime has been Approved, it shall, for the purposes of this Agreement, be the **"Train Maintenance Regime"** in relation to the Fleet that is the subject of the relevant Whole Line Option. In accordance with clause 13, the Manufacturer shall provide the maintenance documentation for the relevant Whole Line Option referred to in paragraph 2 of schedule 28 (Technical Information) in order to support the Train Maintenance Regime for the relevant Fleet.

10. **CLAUSE 14 (TESTING AND CERTIFICATION)**

Clause 14 and schedule 7 (Testing and Inspection) shall apply separately in relation to each Whole Line Option on and from the Commencement Date in relation to the relevant Whole Line Option. The Manufacturer may apply to the Purchaser for consideration of a waiver of any Test (**"Second Test"**) for the relevant Whole Line Option where an equivalent test has already been carried out in connection with the Base Order or a previous Whole Line Option (**"Earlier Test"**) where the Manufacturer has demonstrated to the satisfaction of the Purchaser that the results of the Earlier Test provide the requisite validation for the Second Test. A waiver of a Second Test, either in part or in full, is entirely at the discretion of the Purchaser and no reason need be given for the refusal of an application for a waiver.

11. **CLAUSE 16 (ACCEPTANCE LIQUIDATED DAMAGES)**

11.1 in applying clause 16 to the Whole Line Options, the amount referred to in clause 16.1 shall be:

- (a) £10,000 for each Bakerloo Line Train;
- (b) £10,000 for each Central Line Train; and
- (c) £10,000 for each Waterloo & City Line Train,

and, in each case, Indexed.

11.2 the amount referred to in clause 16.2 shall be:

- (a) £7,925.45 for each WLO Train Driving Simulator for the Bakerloo Line; and
- (b) £7,925.45 for each WLO Train Driving Simulator for the Central Line,

and, in each case, Indexed.

12. **CLAUSE 19 AND SCHEDULE 13 (INSURANCE)**

The insurance requirements and obligations to effect Insurances required for the Base Order in clause 19 and schedule 13 shall apply equally to each Whole Line Option, including the requirements of paragraph 2.1(f) above.

13. CLAUSE 29 (INTELLECTUAL PROPERTY RIGHTS)

The licences referred to in clauses 29.3, 29.4 and 29.5(c) are granted in relation to each WLO Purchased Item from the Commencement Date in respect of the relevant Whole Line Option and in clause 29.7, Train Features shall include those features in clause 29.7(b) in relation to WLO Trains from the relevant Commencement Date for the relevant Whole Line Option.

14. SCHEDULE 8 (SPARES AND SPECIAL TOOLS)

14.1 Parts A:, B:, C: and D: of schedule 8 (Spares and Special Tools) applicable to the relevant Whole Line Option shall be based on the information provided in Appendices 5, 6 and 7 to this schedule 25 as amended by the Whole Line Option Notice pursuant to the process set out in clause 6.10(g).

14.2 The amounts set out in the Bill of Materials for the relevant Whole Line Option in Part D: of Appendices 5, 6 and/or 7 (as applicable) shall be multiplied as at the date of the relevant Whole Line Option Notice by the Whole Line Option Indexation Adjustment in accordance with paragraph 15.6 below.

14.3 The final relevant versions of Parts A:, B:, C: and D: of Appendices 5, 6 and/or 7 to this schedule 25 will be included in the Appendix to the relevant Whole Line Option Notice.

15. SCHEDULE 10 (MILESTONES AND SECURITY)

15.1 Part A: (Advance Payment Bond) of schedule 10 as amended by this schedule 25 shall apply to each Whole Line Option and such provisions shall apply separately in relation to each Whole Line Option. For the avoidance of doubt, this means that the increases and decreases in the Required APB Bond Amount apply separately in relation to each Fleet.

15.2 Appendix 1 (Schedule of Milestones) to Part B: (Milestones) of schedule 10 for the purposes of each Whole Line Option shall be as set out in Appendix 2 to this schedule 25 as amended by the Whole Line Option Notice pursuant to the process set out in clause 6.10(g).

15.3 Appendix 2 (Total Contract Price) to Part B: (Milestones) of schedule 10 for the purposes of each Whole Line Option shall be as set out in the table for the relevant Whole Line Option in Appendix 3 to this schedule 25 with such amounts being multiplied as at the date of the relevant Whole Line Option Notice by the Whole Line Option Indexation Adjustment in accordance with paragraph 15.6 below, provided that if the Purchaser has already paid the Remobilisation Payment in relation to a Whole Line Option because the Whole Line Option was exercised after the WLO Break in Production Date, the Purchaser shall not be required to pay a further Remobilisation Payment if a subsequent Whole Line Option is exercised later than the WLO Break in Production Date relevant to that subsequent Whole Line Option.

15.4 Any Remobilisation Payment payable in relation to each Whole Line Option shall be payable on the Commencement Date in relation to such Whole Line Option and shall be made in accordance with the terms of clause 25 (Payments and VAT).

15.5 Part C: (Base Order Options for supply of further Trains and Equipment) of schedule 10 for each Whole Line Option shall be as set out in Appendix 4 to this schedule 25.

15.6 Indexation for Whole Line Options

The Whole Line Option Indexation Adjustment shall be calculated in accordance with the following formula.

$$WLOIA = \left(\frac{RPI_y}{RPI_x} \times a \right) + \left(\frac{AWE_y}{AWE_x} \times b \right) + \left(\frac{PPI_y}{PPI_x} \times c \right) + d$$

WLOIA means the Whole Line Option Indexation Adjustment;

RPI_y means the value of RPI for the month preceding the month in which the Whole Line Option Notice (or, in the case of Bakerloo Line Extension Trains only, the relevant WLO Additional Trains Option Notice) is delivered;

RPI_x means the value of RPI for April 2015 published in May 2015;

AWE_y means the value of AWE for the month preceding the month in which the Whole Line Option Notice (or, in the case of Bakerloo Line Extension Trains only, the relevant WLO Additional Trains Option Notice) is delivered;

AWE_x means the value of AWE for April 2015 published in May 2015;

PPI_y means the value of PPI for the month preceding the month in which the Whole Line Option Notice (or, in the case of Bakerloo Line Extension Trains only, the relevant WLO Additional Trains Option Notice) is delivered;

PPI_x means the value of PPI for April 2015 published in May 2015;

a means the applicable percentage for RPI as set out in Table 1 below;

b means the applicable percentage for AWE as set out in Table 1 below;

c means the applicable percentage for PPI as set out in Table 1 below; and

d means the applicable percentage for Unindexed costs as set out in Table 1 below.

(a) **Changes to the Indices**

If any of the indices referred to in this paragraph 15.6 ceases to be published, then such other appropriate index that may be published in place thereof shall apply or, in the absence of an appropriate replacement index, such index shall apply as the Parties may agree.

(b) **Base Date of Indices**

If any of the indices specified in this paragraph 15.6 is superseded by an index with a base date which is later than the base date of the indices specified above, the superseding index shall be used or an index with a later base date, as the case may require.

(c) **Provisional Indices**

Where an index is published as "provisional" and is subsequently amended:

- (i) the calculation of any applicable adjustment may be undertaken using the published provision index and invoices may be rendered accordingly;
- (ii) any published amendment to the provisional index shall result in recalculation of any application adjustment; and
- (iii) such recalculation shall be retrospective for the relevant period, and

the Party disadvantaged by the amendment to the provisional index shall be entitled to recover the difference in the value of any invoice calculated on the basis of an amended provisional index.

TABLE 1 – WHOLE LINE OPTION INDEXATION

16. **SCHEDULE 11 (SUBCONTRACTS)**

Key Subcontractors in relation to the Whole Line Options shall be the same as for the Base Order unless the Purchaser has given prior written consent to a change in identity of any Key Subcontractor.

APPENDIX 1

Purchaser Depot Works for Whole Line Options

Part A: Bakerloo Line Purchaser Depot Works

Part B: Central Line Purchaser Depot Works

Part C: Waterloo & City Line Purchaser Depot Works

APPENDIX 2**Schedules of Milestones for Whole Line Options****Part A: Schedule of Milestones for the WLO Base Order for the Bakerloo Line²⁰**

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond²¹	(5) scheduled Date for Achievement
1.	Commencement Date in relation to the Bakerloo Line Whole Line Option	Whole Line Option Notice exercised and satisfaction of all relevant conditions precedent including an Advance Payment Bond in full force and effect with an initial APB Bond Amount equal to the proposed Milestone Payment.	[REDACTED]	[REDACTED]	
2.	Mobilisation and Final Design Phase complete	(1) Mobilisation of the Manufacturer's project team (including the appointment of those Key Posts required to be appointed by the end of the Final Design Phase); and (2) completion of the Final Design as evidenced by Assurance of the Final Design by the Purchaser in accordance with schedule 17 (Design Management).	[REDACTED]	[REDACTED]	

²⁰ Note: The Schedule of Milestones Table in Part A: of Appendix 2 to schedule 25 will be populated following (a) exercise of a Whole Line Option Notice by the Purchaser; and (b) application of the Financial Close Protocol for the relevant Whole Line Option pursuant to paragraph 2.(c) of schedule 25.

²¹ Note: the Purchaser will not accept an APB Bond Amount which is lower than the cumulative amount paid as Milestone payments for Trains and Equipment prior to Train Acceptance.

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond²¹	(5) scheduled Date for Achievement
3.	Approval of the Train/ PDP Interface Control Documents	Approval of the Train/ PDP Interface Control Documents by the Purchaser.	■	■	
4.	Commencement of the assembly of the first and second Trains in the Bakerloo Line Fleet	Commencement of the assembly of the first and second Trains in the Bakerloo Line Fleet, and confirmation that all necessary Manufacturing Tooling, materials, equipment and labour are available as required.	■■■■■	■■■■■	
5.	Completion of the assembly of the first and second Trains in the Bakerloo Line Fleet	Completion of the assembly of the first and second Trains in the Bakerloo Line Fleet and completion of Routine Testing in accordance with schedule 7 (Testing and Inspection).	■■■■■ ■■■■■ ■■■■■ ■■■■■	■■■■■	
6.	Commencement of the assembly of the third Train in the Bakerloo Line Fleet	Commencement of the assembly of the third Train in the Bakerloo Line Fleet, and evidence that all necessary Manufacturing Tooling, materials, equipment and labour are available as required to continue the manufacture of the Bakerloo Line Fleet.	■■■■■ ■■■■■ ■■■■■ ■■■■■	■■■■■	
7.	Acceptance of the Train Driving Simulators	Issue of an Equipment Acceptance Certificate in relation to each WLO Train Driving Simulator for the Bakerloo Line Fleet.	■	■	
8.	Train Acceptance	Issue of a QPAC or PAC (whichever	■■■■■ ■■■■■	■■■■■	

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond²¹	(5) scheduled Date for Achievement
		occurs first) in relation to each Train.	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]		
9.	Fleet Acceptance	Issue of Fleet Acceptance Certificate in relation to the Bakerloo Line Fleet.	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED]	

Part B: Schedule of Milestones for the WLO Base Order for the Central Line²²

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond²³	(5) scheduled Date for Achievement
1.	Commencement Date in relation to the Central Line Whole Line Option	Whole Line Option Notice exercised and satisfaction of all relevant conditions precedent including an Advance Payment Bond in full force and effect with an initial APB Bond Amount equal to the proposed Milestone Payment.			
2.	Mobilisation and Final Design Phase complete	(1) Mobilisation of the Manufacturer's project team (including the appointment of those Key Posts required to be appointed by the end of the Final Design Phase); and (2) completion of the Final Design as evidenced by Assurance of the Final Design by the Purchaser in accordance with schedule 17 (Design Management).			
3.	Approval of the Train/ PDP Interface Control Documents	Approval of the Train/ PDP Interface Control Documents by the Purchaser.			
4.	Commencement of the assembly of the first and second Trains in the Central	Commencement of the assembly of the first and second Trains in the Central Fleet, and confirmation that all necessary Manufacturing Tooling, materials,			

²² Note: The Schedule of Milestones Table in Part B: of Appendix 2 to schedule 25 will be populated following (a) exercise of a Whole Line Option Notice by the Purchaser; and (b) application of the Financial Close Protocol for the relevant Whole Line Option pursuant to paragraph 2.(c) of schedule 25.

²³ Note: the Purchaser will not accept an APB Bond Amount which is lower than the cumulative amount paid as Milestone payments for Trains and Equipment prior to Train Acceptance.

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond²³	(5) scheduled Date for Achievement
	Line Fleet	equipment and labour are available as required.	██████████ ██████████████████		
5.	Completion of the assembly of the first and second Trains in the Central Line Fleet	Completion of the assembly of the first and second Trains in the Central Line Fleet and completion of Routine Testing in accordance with schedule 7 (Testing and Inspection).	██████████████████ ██████████████████ ██████████████████ ██████████ ██████████████████	██████████	
6.	Commencement of the assembly of the third Train in the Central Line Fleet	Commencement of the assembly of the third Train in the Central Line Fleet, and evidence that all necessary Manufacturing Tooling, materials, equipment and labour are available as required to continue the manufacture of the Central Line Fleet.	██████████████████ ██████████████████ ██████████████████ ██████████ ██████████████████	██████████	
7.	Acceptance of the Train Driving Simulators	Issue of an Equipment Acceptance Certificate in relation to each WLO Train Driving Simulator for the Central Line Fleet.	██████████	██████████	
8.	Train Acceptance	Issue of a QPAC or PAC (whichever occurs first) in relation to each Train.	██████████████████ ██████████████████ ██████████████████ ██████████████████ ██████████ ██████████████████	██████████	

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) Milestone Payment	(4) Increases in the APB Bond Amount under Advance Payment Bond ²³	(5) scheduled Date for Achievement
9.	Fleet Acceptance	Issue of Fleet Acceptance Certificate in relation to the Central Line Fleet.			

Part C: Schedule of Milestones for the WLO Base Order for the Waterloo & City Line²⁴

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) Start Date	(4) End Date	(5) scheduled Date for Achievement
1.	Commencement Date in relation to the Waterloo & City Line Whole Line Option	Whole Line Option Notice exercised and satisfaction of all relevant conditions precedent including an Advance Payment Bond in full force and effect with an initial APB Bond Amount equal to the proposed Milestone Payment.			
2.	Mobilisation and Final Design Phase complete	(1) Mobilisation of the Manufacturer's project team (including the appointment of those Key Posts required to be appointed by the end of the Final Design Phase); and (2) completion of the Final Design as evidenced by Assurance of the Final Design by the Purchaser in accordance with schedule 17 (Design Management).			
3.	Approval of the Train/ PDP Interface Control Documents	Approval of the Train/ PDP Interface Control Documents by the Purchaser.			
4.	Commencement of the assembly of the first Train in the Waterloo & City Line	Commencement of the assembly of the first Train in the Waterloo & City Line Fleet, and confirmation that all necessary Manufacturing Tooling, materials,			

²⁴ Note: The Schedule of Milestones Table in Part C: of Appendix 2 to schedule 25 will be populated following (a) exercise of a Whole Line Option Notice by the Purchaser; and (b) application of the Financial Close Protocol for the relevant Whole Line Option pursuant to paragraph 2.(c) of schedule 25.

²⁵ Note: the Purchaser will not accept an APB Bond Amount which is lower than the cumulative amount paid as Milestone payments for Trains and Equipment prior to Train Acceptance.

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone	(3) [Redacted]	(4) [Redacted]	(5) scheduled Date for Achievement
	Fleet	equipment and labour are available as required.	[Redacted]		
5.	Completion of the assembly of the first Train in the Waterloo & City Line Fleet	Completion of the assembly of the first Train in the Waterloo & City Line Fleet and completion of Routine Testing in accordance with schedule 7 (Testing and Inspection).	[Redacted]	[Redacted]	
6.	Commencement of the assembly of the second Train in the Waterloo & City Line Fleet	Commencement of the assembly of the second Train in the Waterloo & City Line Fleet, and evidence that all necessary Manufacturing Tooling, materials, equipment and labour are available as required to continue the manufacture of the Waterloo & City Line Fleet.	[Redacted]	[Redacted]	
7.	Acceptance of the Train Driving Simulators	Issue of an Equipment Acceptance Certificate in relation to each WLO Train Driving Simulator for the Waterloo & City Line Fleet.	[Redacted]	[Redacted]	
8.	Train Acceptance	Issue of a QPAC or PAC (whichever occurs first) in relation to each Train.	[Redacted]	[Redacted]	

(1) Milestone		(2) Actions required to have been achieved by the Manufacturer to meet the Milestone			(5) scheduled Date for Achievement
9.	Fleet Acceptance	Issue of Fleet Acceptance Certificate in relation to the Waterloo & City Line Fleet.			

APPENDIX 3

Appendix 3 to Part B: of schedule 10 for Whole Line Options

1.1 WLO Base Order for Bakerloo Line

WLO Contract Price for WLO Base Order for Bakerloo Line

[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED] [REDACTED]	[REDACTED]
[REDACTED] [REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED] [REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED] [REDACTED]	[REDACTED]
[REDACTED] [REDACTED] [REDACTED]	[REDACTED]

1.2 WLO Base Order for Central Line

WLO Contract Price for WLO Base Order for Central Line

²⁶ Note to Siemens: The WLO Contract Price table in paragraph 1.1 of Appendix 3 to schedule 25 will be populated following (a) execution of a Whole Line Option Notice; and (b) application of the Financial Close Protocol for the relevant Whole Line Option pursuant to paragraph 2.(c) of schedule 25.

Column (1)	Column (2)
Item	Contract Price²⁷
89 Central Line Trains @ £11,782,639 per Central Line Train	£1,048,654,880
4 WLO Train Driving Simulators @ £606,181 per WLO Train Driving Simulator	£2,424,726
Central Line Warranty Spares	£7,793,967
Central Line Purchaser Fault Spares	£0
Central Line Maintenance Spares	£14,220,843
Central Line Special Tools	£4,523,673
Central Line Non-Standard Tools	£105,263
1 Central Line Saloon Mock-up	£2,649,543
Central Line Technical Documents	£500,112
OTC - Infrastructure-Borne Equipment for the Central Line	£1,554,950
1 Central Line Cab Conversion Unit	£107,569
1 set of Automatic Lineside Inspection Equipment	£2,516,660
ACS Services carried out under this Agreement for the Central Line Base Order	£5,126,160
WLO Contract Price (rounded to nearest £)	£1,090,178,345
Remobilisation Payment if Whole Line Option exercised after WLO Break in Production Date	£13,331,293

1.3 WLO Base Order for Waterloo & City Line

WLO Contract Price for WLO Base Order for Waterloo & City Line

²⁷ Note to Siemens: The WLO Contract Price table in paragraph 1.2 of Appendix 3 to schedule 25 will be populated following (a) execution of a Whole Line Option Notice; and (b) application of the Financial Close Protocol for the relevant Whole Line Option pursuant to paragraph 2.(c) of schedule 25.

²⁸ Note to Siemens: The WLO Contract Price table in paragraph 1.3 of Appendix 3 to schedule 25 will be populated following (a) execution of a Whole Line Option Notice; and (b) application of the Financial Close Protocol for the relevant Whole Line Option pursuant to paragraph 2.(c) of schedule 25.

[REDACTED] [REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED] [REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED] [REDACTED]	[REDACTED]
[REDACTED] [REDACTED]	[REDACTED]
[REDACTED] [REDACTED] [REDACTED]	[REDACTED]

APPENDIX 4

Part C: of schedule 10 in relation to Whole Line Options

1. **WLO Additional Trains Option Price for WLO Additional Trains, WLO Additional Train Driving Simulators and WLO Additional Cab Conversion Units for the Bakerloo Line**

TABLE 1 – OPTION PRICES²⁹[illegible]

Where the Purchaser delivers a WLO Additional Trains Option Notice, the WLO Additional Trains Option Price shall be the Foreign Exchange Adjusted WLO Additional Trains Option Price calculated as set out in paragraph 1.1 below.

1.1 Foreign Exchange Adjustment

The Foreign Exchange Adjusted WLO Additional Trains Option Price for each WLO Additional Train, WLO Additional Train Driving Simulator, WLO Additional Cab Conversion

29 Note: Table 1 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

Unit or WLO Additional Spare shall be calculated by applying the Agreed Forward Rates to the relevant amounts in Table 2 below that are not denominated in £ sterling and adding the relevant amount in Table 2 denominated in £ sterling.

TABLE 2 – FOREIGN CURRENCY BREAKDOWN³⁰[illegible]

30 Note: Table 2 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

2. **WLO Additional Trains Option Price for WLO Additional Trains, WLO Additional Train Driving Simulators and WLO Additional Cab Conversion Units for the Central Line**

TABLE 1 – OPTION PRICES³¹[illegible]

Where the Purchaser delivers a WLO Additional Trains Option Notice, the WLO Additional Trains Option Price shall be the Foreign Exchange Adjusted WLO Additional Trains Option Price calculated as set out in paragraph 2.1 below.

2.1 Foreign Exchange Adjustment

The Foreign Exchange Adjusted WLO Additional Trains Option Price for each WLO Additional Train or WLO Additional Spare shall be calculated by applying the Agreed Forward Rates to the relevant amounts in Table 2 below that are not denominated in £ sterling and adding the relevant amount in Table 2 denominated in £ sterling.

³¹ Note: Table 1 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

TABLE 2 – FOREIGN CURRENCY BREAKDOWN³²[illegible]

32 Note: Table 2 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

3. **WLO Additional Trains Option Price for WLO Additional Trains, WLO Additional Train Driving Simulators and WLO Additional Cab Conversion Units for the Waterloo & City Line**

TABLE 1 – OPTION PRICES³³[illegible]

Where the Purchaser delivers a WLO Additional Trains Option Notice, the WLO Additional Trains Option Price shall be the Foreign Exchange Adjusted WLO Additional Trains Option Price calculated as set out in paragraph 3.1 below.

3.1 Foreign Exchange Adjustment

The Foreign Exchange Adjusted WLO Additional Trains Option Price for each WLO Additional Train or WLO Additional Spare shall be calculated by applying the Agreed Forward Rates to the relevant amounts in Table 2 below that are not denominated in £ sterling and adding the relevant amount in Table 2 denominated in £ sterling.

³³ Note: Table 1 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

TABLE 2 – FOREIGN CURRENCY BREAKDOWN³⁴[illegible]

34 Note: Table 2 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

4. **WLO Additional Trains Option Price for Bakerloo Line Extension Trains**

TABLE 1 – OPTION PRICES³⁵

Where the Purchaser delivers a WLO Additional Trains Option Notice, the WLO Additional Trains Option Price shall be the Foreign Exchange Adjusted WLO Additional Trains Option Price calculated as set out in paragraph 4.1 below and if the WLO Additional Trains Option Notice is delivered after the date shown in first row of Column (3), then the WLO Additional Trains Option Price shall constitute the Foreign Exchange Adjusted WLO Additional Trains Option Price multiplied as at the date of the relevant Whole Line Option Notice by the Whole Line Option Indexation Adjustment in accordance with paragraph 15.6 of this schedule 25.

4.1 **Foreign Exchange Adjustment**

The Foreign Exchange Adjusted WLO Additional Trains Option Price for each Bakerloo Line Extension Train or WLO Additional Spare shall be calculated by applying the Agreed Forward Rates to the relevant amounts in Table 2 below that are not denominated in £ sterling and adding the relevant amount in Table 2 denominated in £ sterling.

³⁵ Note: Table 1 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

³⁶ Note: Table 2 will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

██████████ ██████████ ██████████	██████████ ██████████ ██████████	████████████████████ ██████████ ██████████████████ ██████████████████	████████████████████ ██████████ ██████████████████ ██████████████████
██████████████████ ██████████	██████████ ██████████ ██████████████████ ██████████	████████████████████ ██████████ ██████████████████ ██████████████████	████████████████████ ██████████ ██████████████████ ██████████████████

Appendix 5

Spares and Special Tools for Bakerloo Line

Part A:	Bakerloo Line Spares
Part B:	Bakerloo Line Special Tools
Part C:	Bakerloo Line Non-Standard Tools
Part D:	Bakerloo Line Bill of Materials

Part A: Bakerloo Line Spares

Part B: Bakerloo Line Special Tools

Part C: Bakerloo Line Non-Standard Tools

Part D: Bakerloo Line Bill of Materials**1. NOTES FOR THE COMPLETION OF THE BAKERLOO LINE BILL OF MATERIALS:**

1.1 The Bakerloo Line Bill of Materials shall be provided in Microsoft Excel Format.

1.2 The Bakerloo Line Bill of Materials is to be completed in full. Columns are free text with content to be completed by the Manufacturer. Columns with an * are to be completed using the options detailed below prescribed by the Purchaser. Options are defined in paragraph 1.3 below.

1.3 Definitions

(a) **"Item Code"** means the Manufacturer's part number for the Item. For Repair Services the part number is to be prefixed "REP".

(b) **"Item Type"**

Example Options:

- (i) Component
- (ii) Assembly
- (iii) Sub Assembly
- (iv) Consumable
- (v) Repair Service
- (vi) Tool
- (vii) Tool Calibration Status

(c) **"Parent Item"** – The master Item to which a sub assembly or component relates.

(d) **"Category"** – Train System to which the Item described is incorporated.

Example Options:

- (i) Braking Systems
- (ii) Traction/Propulsion
- (iii) Doors
- (iv) Carbody
- (v) Bogie/Suspension
- (vi) Couplings
- (vii) Underframe
- (viii) Auxiliaries
- (ix) Heating & Ventilation
- (x) Air Supply

- (xi) Electrical Distribution
- (xii) Emergency Equipment
- (xiii) Fault Recording Equipment
- (xiv) Communications
- (xv) Paint
- (xvi) Shoe gear
- (xvii) Equipment
- (e) **"Zone Code"** – As detailed in LU Category 1 Standard S1187 "Index of Components for Rolling Stock". Must be completed to 4 digits as a minimum and 6 digits where appropriate.
- (f) **"Manufacturer's Location Code"** – if required, produced by the Manufacturer
- (g) **"Safety Criticality Rating"** - as described in the Train Technical Specification
- (h) **"Description"** – Worded description of item. May also detail specification and/or drawing reference
- (i) **"UOM"** – Unit of Measure
- (j) **"Price"** – To be priced in GBP inclusive of delivery, Tooling Charges and duty excluding VAT
- (k) **"MOQ"** – Minimum order quantity
- (l) **"EOQ"** – Economic order quantity
- (m) **"Lead Time"** – Agreed period of time from issue of Purchase Order to delivery of the goods/services to the Purchaser's specified delivery location.
- (n) **"Warranty Period"** – Minimum period 2 years or to the end of the Train Warranty Period of the Fleet to which the Item/Spare/Consumable relates (if longer). Period commences upon delivery of an Item to the Purchaser.
- (o) **"Drawing Ref"** - Any drawings related to the Item.
- (p) **"Specification Ref"** - Any specification documents related to the Item.
- (q) **"Component Overhaul Instructions (COI) Ref"** – Reference to the related COI for the Item.
- (r) **"OEM"** – Original Equipment Manufacturer of the Item.
- (s) **"OEM Part Number"** - Original Equipment Manufacturer Part Number
- (t) **"OEM Drawing Ref"** - Original Equipment Drawing Reference
- (u) **"OEM Specification Ref"** - Original Equipment Manufacturer Specification Reference
- (v) **"Serialised Part"** – Identify if the Part is serialised
- (w) **"Storage Instructions"** – Any specific instructions relating to storage

- (x) **"Repairs"** - Manufacturer's Standard Labour Rate for Repairs [REDACTED]
- (y) **"Design Life"** – as defined in clause 20.1
- (z) **"ACS/Overhaul Component? Y/N"** – indicate whether or not this Part satisfies the definition of an ACS/Overhaul Component
- (aa) **"Relevant Sample"** – for ACS Services, the sample size of each ACS/Overhaul Component on which the Manufacturer will carry out an Asset Condition Survey sufficient to give confidence to the Purchaser that (i) the sample is representative of the relevant Fleet; and (ii) the confirmation regarding Early Deterioration (as defined in the FSA) (or otherwise) in accordance with paragraph 8.4 of Part B of schedule 1 (The Services) of the FSA is valid

Bill of Materials – Bakerloo Line

Appendix 6

Spares and Special Tools for the Central Line

Part A:	Central Line Spares
Part B:	Central Line Special Tools
Part C:	Central Line Non-Standard Tools
Part D:	Central Line Bill of Materials

Part A: Central Line Spares

Part B: Central Line Special Tools

Part C: Central Line Non-Standard Tools

Part D: Central Line Bill of Materials**1. NOTES FOR THE COMPLETION OF THE CENTRAL LINE BILL OF MATERIALS:**

1.1 The Central Line Bill of Materials shall be provided in Microsoft Excel Format.

1.2 The Central Line Bill of Materials is to be completed in full. Columns are free text with content to be completed by the Manufacturer. Columns with an * are to be completed using the options detailed below prescribed by the Purchaser. Options are defined in paragraph 1.3 below.

1.3 Definitions

(a) **"Item Code"** means the Manufacturer's part number for the Item. For Repair Services the part number is to be prefixed "REP".

(b) **"Item Type"**

Example Options:

- (i) Component
- (ii) Assembly
- (iii) Sub Assembly
- (iv) Consumable
- (v) Repair Service
- (vi) Tool
- (vii) Tool Calibration Status

(c) **"Parent Item"** – The master Item to which a sub assembly or component relates.

(d) **"Category"** – Train System to which the Item described is incorporated.

Example Options:

- (i) Braking Systems
- (ii) Traction/Propulsion
- (iii) Doors
- (iv) Carbody
- (v) Bogie/Suspension
- (vi) Couplings
- (vii) Underframe
- (viii) Auxiliaries
- (ix) Heating & Ventilation
- (x) Air Supply

- (xi) Electrical Distribution
- (xii) Emergency Equipment
- (xiii) Fault Recording Equipment
- (xiv) Communications
- (xv) Paint
- (xvi) Shoe gear
- (xvii) Equipment
- (e) **"Zone Code"** – As detailed in LU Category 1 Standard S1187 "Index of Components for Rolling Stock". Must be completed to 4 digits as a minimum and 6 digits where appropriate.
- (f) **"Manufacturer's Location Code"** – if required, produced by the Manufacturer
- (g) **"Safety Criticality Rating"** - as described in the Train Technical Specification
- (h) **"Description"** – Worded description of item. May also detail specification and/or drawing reference
- (i) **"UOM"** – Unit of Measure
- (j) **"Price"** – To be priced in GBP inclusive of delivery, Tooling Charges and duty excluding VAT
- (k) **"MOQ"** – Minimum order quantity
- (l) **"EOQ"** – Economic order quantity
- (m) **"Lead Time"** – Agreed period of time from issue of Purchase Order to delivery of the goods/services to the Purchaser's specified delivery location.
- (n) **"Warranty Period"** – Minimum period 2 years or to the end of the Train Warranty Period of the Fleet to which the Item/Spare/Consumable relates (if longer). Period commences upon delivery of an Item to the Purchaser.
- (o) **"Drawing Ref"** - Any drawings related to the Item.
- (p) **"Specification Ref"** - Any specification documents related to the Item.
- (q) **"Component Overhaul Instructions (COI) Ref"** – Reference to the related COI for the Item.
- (r) **"OEM"** – Original Equipment Manufacturer of the Item.
- (s) **"OEM Part Number"** - Original Equipment Manufacturer Part Number
- (t) **"OEM Drawing Ref"** - Original Equipment Drawing Reference
- (u) **"OEM Specification Ref"** - Original Equipment Manufacturer Specification Reference
- (v) **"Serialised Part"** – Identify if the Part is serialised
- (w) **"Storage Instructions"** – Any specific instructions relating to storage

- (x) **"Repairs"** - Manufacturer's Standard Labour Rate for Repairs [REDACTED]
- (y) **"Design Life"** – as defined in clause 20.1
- (z) **"ACS/Overhaul Component? Y/N"** – indicate whether or not this Part satisfies the definition of an ACS/Overhaul Component
- (aa) **"Relevant Sample"** – for ACS Services, the sample size of each ACS/Overhaul Component on which the Manufacturer will carry out an Asset Condition Survey sufficient to give confidence to the Purchaser that (i) the sample is representative of the relevant Fleet; and (ii) the confirmation regarding Early Deterioration (as defined in the FSA) (or otherwise) in accordance with paragraph 8.4 of Part B of schedule 1 (The Services) of the FSA is valid

Bill of Materials – Central Line

Appendix 7

Spares and Special Tools for the Waterloo & City Line

Part A:	Waterloo & City Line Spares
Part B:	Waterloo & City Line Special Tools
Part C:	Waterloo & City Line Non-Standard Tools
Part D:	Waterloo & City Line Bill of Materials

Part A: Waterloo & City Line Spares

Part B: Waterloo & City Line Special Tools

Part C: Waterloo & City Line Non-Standard Tools

Part D: Waterloo & City Line Bill of Materials**1. NOTES FOR THE COMPLETION OF THE WATERLOO & CITY LINE BILL OF MATERIALS:**

- 1.1 The Waterloo & City Line Bill of Materials shall be provided in Microsoft Excel Format.
- 1.2 The Waterloo & City Line Bill of Materials is to be completed in full. Columns are free text with content to be completed by the Manufacturer. Columns with an * are to be completed using the options detailed below prescribed by the Purchaser. Options are defined in paragraph 1.3 below.

1.3 Definitions

- (a) **"Item Code"** means the Manufacturer's part number for the Item. For Repair Services the part number is to be prefixed "REP".

(b) **"Item Type"**

Example Options:

- (i) Component
- (ii) Assembly
- (iii) Sub Assembly
- (iv) Consumable
- (v) Repair Service
- (vi) Tool
- (vii) Tool Calibration Status

- (c) **"Parent Item"** – The master Item to which a sub assembly or component relates.

- (d) **"Category"** – Train System to which the Item described is incorporated.

Example Options:

- (i) Braking Systems
- (ii) Traction/Propulsion
- (iii) Doors
- (iv) Carbody
- (v) Bogie/Suspension
- (vi) Couplings
- (vii) Underframe
- (viii) Auxiliaries
- (ix) Heating & Ventilation
- (x) Air Supply

- (xi) Electrical Distribution
- (xii) Emergency Equipment
- (xiii) Fault Recording Equipment
- (xiv) Communications
- (xv) Paint
- (xvi) Shoe gear
- (xvii) Equipment
- (e) **"Zone Code"** – As detailed in LU Category 1 Standard S1187 "Index of Components for Rolling Stock". Must be completed to 4 digits as a minimum and 6 digits where appropriate.
- (f) **"Manufacturer's Location Code"** – if required, produced by the Manufacturer
- (g) **"Safety Criticality Rating"** - as described in the Train Technical Specification
- (h) **"Description"** – Worded description of item. May also detail specification and/or drawing reference
- (i) **"UOM"** – Unit of Measure
- (j) **"Price"** – To be priced in GBP inclusive of delivery, Tooling Charges and duty excluding VAT
- (k) **"MOQ"** – Minimum order quantity
- (l) **"EOQ"** – Economic order quantity
- (m) **"Lead Time"** – Agreed period of time from issue of Purchase Order to delivery of the goods/services to the Purchaser's specified delivery location.
- (n) **"Warranty Period"** – Minimum period 2 years or to the end of the Train Warranty Period of the Fleet to which the Item/Spare/Consumable relates (if longer). Period commences upon delivery of an Item to the Purchaser.
- (o) **"Drawing Ref"** - Any drawings related to the Item.
- (p) **"Specification Ref"** - Any specification documents related to the Item.
- (q) **"Component Overhaul Instructions (COI) Ref"** – Reference to the related COI for the Item.
- (r) **"OEM"** – Original Equipment Manufacturer of the Item.
- (s) **"OEM Part Number"** - Original Equipment Manufacturer Part Number
- (t) **"OEM Drawing Ref"** - Original Equipment Drawing Reference
- (u) **"OEM Specification Ref"** - Original Equipment Manufacturer Specification Reference
- (v) **"Serialised Part"** – Identify if the Part is serialised
- (w) **"Storage Instructions"** – Any specific instructions relating to storage

- (x) **"Repairs"** - Manufacturer's Standard Labour Rate for Repairs [REDACTED]
- (y) **"Design Life"** – as defined in clause 20.1
- (z) **"ACS/Overhaul Component? Y/N"** – indicate whether or not this Part satisfies the definition of an ACS/Overhaul Component
- (aa) **"Relevant Sample"** – for ACS Services, the sample size of each ACS/Overhaul Component on which the Manufacturer will carry out an Asset Condition Survey sufficient to give confidence to the Purchaser that (i) the sample is representative of the relevant Fleet; and (ii) the confirmation regarding Early Deterioration (as defined in the FSA) (or otherwise) in accordance with paragraph 8.4 of Part B of schedule 1 (The Services) of the FSA is valid

Bill of Materials – Waterloo & City Line

Appendix 8

Foreign Exchange provisions for Whole Line Options

Part A: Bakerloo Line Interim Milestone Payments

Bakerloo Line Initial APB Bond Amount

1. Bakerloo Line Trains and Equipment

[illegible]

Appendix 2

37 Note: Bakerloo Line Initial APB Bond will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

38 Note: Milestone payments will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

Part B: Central Line Interim Milestone Payments**Central Line Initial APB Bond Amount**

[REDACTED]

1. Central Line Trains and Equipment

	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]
■	[REDACTED]	[REDACTED]

⁴⁰ Note: Central Line Initial APB Bond Amount will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

⁴¹ Note: Milestone Payments will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

Part C: Waterloo & City Line Interim Milestone Payments**Waterloo & City Line Initial APB Bond Amount**

[REDACTED]

1. Waterloo & City Line Trains and Equipment

	[REDACTED]	[REDACTED]
1.	[REDACTED]	[REDACTED]
2.	[REDACTED]	[REDACTED]
3.	[REDACTED]	[REDACTED]
4.	[REDACTED]	[REDACTED]
5.	[REDACTED]	[REDACTED]
6.	[REDACTED]	[REDACTED]
7.	[REDACTED]	[REDACTED]
8.	[REDACTED]	[REDACTED]
9.	[REDACTED]	[REDACTED]

⁴³ Note: the Waterloo & City Line Initial APB Bond Amount will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

⁴⁴ Note: the Contract Price will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

Appendix 2

to Part C:

Waterloo & City Line WLO Contract Price

[REDACTED]	
[REDACTED]	
[REDACTED] [REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED] [REDACTED]	
[REDACTED] [REDACTED]	
[REDACTED] [REDACTED] [REDACTED]	

⁴⁵ Note: the Contract Price will be populated following application of the Financial Close Protocol pursuant to schedule 24 (Foreign Exchange).

Appendix 9

WLO Key Programme Dates

1. Bakerloo Line

Part A: Bakerloo Line Key Programme Dates

Key Programme Dates	
Commencement Date (Milestone 1)	
Submission of Training Strategy	
Submission of Training Programme	
Submission of Assurance Plan	
Mobilisation and Final Design Phase Complete (Milestone 2)	
Approval of the Train/ PDP Interface Control Documents (Milestone 3)	
Commencement of the assembly of the first and second Trains in the Bakerloo Line Fleet (Milestone 4)	
Completion of the assembly of the first and second Trains in the Bakerloo Line Fleet (Milestone 5)	
Commencement of the assembly of the third Train in the Bakerloo Line Fleet (Milestone 6)	
Train Maintenance Regime submitted for Approval	
Automatic Lineside Inspection Equipment ready for use in the relevant Designated Depot	
OTC – Infrastructure-Borne Equipment deliveries commence	
Delivery Depot facilities ready for first Train delivery	
First Train delivered to Delivery Depot	
LUL Network Testing commences	
Purchaser Depot Works finalisation commences	
Maintainability Demonstration Testing carried out in the Designated Depot (or other relevant location) complete	
Acceptance of the Train Driving Simulators (Milestone 7)	
Train Acceptance (Milestone 8) (Multiple Trains)	
Train Number 1	
Train Number 2	
Train Number 3	
Train Number 4	
Train Number 5	
Train Number 6	
Train Number 7	
Train Number 8	
Train Number 9	
Train Number 10	
Train Number 11	
Train Number 12	
Train Number 13	
Train Number 14	
Train Number 15	

Train Number 16	
Train Number 17	
Train Number 18	
Train Number 19	
Train Number 20	
Train Number 21	
Train Number 22	
Train Number 23	
Train Number 24	
Train Number 25	
Train Number 26	
Train Number 27	
Train Number 28	
Train Number 29	
Train Number 30	
Train Number 31	
Train Number 32	
Train Number 33	
Train Number 34	
Train Number 35	
Train Number 36	
Sufficient Bakerloo Line Spares, Bakerloo Line Non-Standard Tools and Bakerloo Line Special Tools that support delivered Trains, (the number and specification of the relevant Bakerloo Line Spares and Bakerloo Line Special Tools corresponds with that required in schedule 8 (Spares and Special Tools))	
First new Train PAC (Milestone 8)	
All Trains Acceptance (Milestone 8)	
Final Acceptance	
Fleet Acceptance (Milestone 9)	

Part B: Bakerloo Line Project Programme

2. Central Line

Part A: Central Line Key Programme Dates

Key Programme Dates	
Commencement Date (Milestone 1)	
Submission of Training Strategy	
Submission of Training Programme	
Submission of Assurance Plan	
Mobilisation and Final Design Phase Complete (Milestone 2)	
Approval of the Train/ PDP Interface Control Documents (Milestone 3)	
Commencement of the assembly of the first and second Trains in the Central Line Fleet (Milestone 4)	
Completion of the assembly of the first and second Trains in the Central Line Fleet (Milestone 5)	
Commencement of the assembly of the third Train in the Central Line Fleet (Milestone 6)	
Train Maintenance Regime submitted for Approval	
OTC – Infrastructure-Borne Equipment deliveries commence	
Delivery Depot facilities ready for first Train delivery	
First Train delivered to Delivery Depot	
Automatic Lineside Inspection Equipment ready for use at the relevant Designated Depot	
LUL Network Testing commences	
Purchaser Depot Works finalisation commences	
Maintainability Demonstration Testing carried out in the Designated Depot (or other relevant location) complete	
Acceptance of the Train Driving Simulators (Milestone 7)	
Train Acceptance (Milestone 8) (Multiple Trains)	
Train Number 1	
Train Number 2	
Train Number 3	
Train Number 4	
Train Number 5	
Train Number 6	
Train Number 7	
Train Number 8	
Train Number 9	
Train Number 10	
Train Number 11	
Train Number 12	
Train Number 13	
Train Number 14	
Train Number 15	
Train Number 16	
Train Number 17	
Train Number 18	

Train Number 19	
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Train Number 74	
Train Number 75	
Train Number 76	
Train Number 77	
Train Number 78	
Train Number 79	
Train Number 80	
Train Number 81	
Train Number 82	
Train Number 83	
Train Number 84	
Train Number 85	
Train Number 86	
Train Number 87	
Train Number 88	
Train Number 89	
Sufficient Central Line Spares, Central Line Non-Standard Tools and Central Line Special Tools that support delivered Trains, (the number and specification of the relevant Central Line Spares and Central Line Special Tools corresponds with that required in schedule 8 (Spares and Special Tools))	
First new Train PAC (Milestone 8)	
All Trains Acceptance (Milestone 8)	
Final Acceptance	
Fleet Acceptance (Milestone 9)	

Part B: Central Line Project Programme

3. **Waterloo & City Line**

Part A: Not Used

Part B: Waterloo & City Line Key Programme Dates (where exercised alongside a Whole Line Option)

Key Programme Dates	
Commencement Date (Milestone 1)	
Submission of Training Strategy	
Submission of Training Programme	
Submission of Assurance Plan	
Mobilisation and Final Design Phase Complete (Milestone 2)	
Approval of the Train/ PDP Interface Control Documents (Milestone 3)	
Commencement of the assembly of the first Train in the Waterloo & City Line Fleet (Milestone 4)	
Completion of the assembly of the first Train in the Waterloo & City Line Fleet (Milestone 5)	
Commencement of the assembly of the second Train in the Waterloo & City Line Fleet (Milestone 6)	
Acceptance of the Train Driving Simulators (Milestone 7)	
Train Maintenance Regime submitted for Approval	
OTC – Infrastructure-Borne Equipment installed	
First Train in the Waterloo & City Fleet delivered to the Delivery Depot	
LUL Network Testing commences	
Automatic Lineside Inspection Equipment ready for use at the Designated Depot	
Purchaser Depot Works complete	
Maintainability Demonstration Testing carried out in the Designated Depot (or other relevant location) complete	
Train Acceptance (Milestone 8) (Multiple Trains)	
Train Number 1	
Train Number 2	
Train Number 3	
Train Number 4	
Train Number 5	
Sufficient Waterloo & City Line Spares, Waterloo & City Line Non-Standard Tools and Waterloo & City Line Special Tools that support delivered Trains, (the number and specification of the relevant Waterloo & City Line Spares and Waterloo & City Line Special Tools corresponds with that required in schedule 8 (Spares and Special Tools))	
First new Train PAC (Milestone 8)	
All Trains Acceptance (Milestone 8)	
Final Acceptance	
Fleet Acceptance (Milestone 9)	

Part C: Waterloo & City Line Project Programme

SCHEDULE 26

Systems Integration

1. GENERAL PRINCIPLES OF SYSTEMS INTEGRATION

The general principles of systems integration shall be as follows:

- 1.1 The Deep Tube Upgrade Programme shall be delivered by one or more PDPs.
- 1.2 The Manufacturer shall work with the Purchaser and other relevant PDPs to meet the requirements of this Agreement.
- 1.3 The Purchaser shall be the prime system integrator for the Deep Tube Upgrade Programme ("**Prime System Integrator**"). As Prime System Integrator, the Purchaser shall:
 - (a) manage the phasing, migration, integration, and acceptance of the end state railway, for the relevant Fleet and its handover to operations and maintenance;
 - (b) lead the integration of the Deep Tube Upgrade Programme as a 'system';
 - (c) create and manage the Interface Register;
 - (d) review the progress of Interface development to ensure timely and satisfactory resolution and provide support to PDPs as necessary; and
 - (e) have the final say and approval for the 'system'.
- 1.4 Issues will be raised and resolved openly and collectively by both the Purchaser and PDPs.
- 1.5 The Manufacturer shall ensure that each Train and each item of Equipment fits and integrates with the other parts of the DTUP System in accordance with the Train Technical Specification.
- 1.6 The Piccadilly Line physical architecture (described in paragraph 5 of this schedule 26 and included in Appendix 2 to this schedule 26) ("**Physical Architecture**") provides a view of the people and product changes required within the DTUP System.
- 1.7 The Manufacturer shall communicate and liaise with other PDPs to ensure that there is a dialogue and information exchange between the PDPs in relation to the different DTUP Systems.
- 1.8 The role and responsibilities of the Manufacturer in relation to each Interface are described in paragraph 2.2 of this schedule 26.
- 1.9 The Manufacturer shall inform the Purchaser as soon as it becomes aware of any problems in relation to systems integration and as soon as reasonably practicable after making the Purchaser aware, work with other PDPs to propose a resolution to the problem.
- 1.10 Changes that the Manufacturer believes are necessary to make to the Train Technical Requirements arising out of paragraph 1.9 above shall be proposed by the Manufacturer in accordance with Part C: (Manufacturer Changes) of schedule 12 (Change Procedure).
- 1.11 If there is a conflict or gap in relation to how the DTUP Systems are integrating, and the PDPs in relation to those systems cannot agree a resolution in accordance with paragraph 1.7, the Purchaser shall have the final decision as to how to proceed.

2. INTERFACE MANAGEMENT

2.1 General

- (a) The Purchaser shall procure that PDPs collaborate to define the Interfaces within their scope of supply with the other relevant PDPs, with oversight from the Purchaser.
- (b) The Purchaser shall appoint a competent and experienced interface manager ("**Purchaser Interface Manager**"). The Purchaser Interface Manager shall act as the single point of contact on the design and management of Interfaces for the Purchaser.
- (c) The Manufacturer shall, and the Purchaser shall procure that each PDP shall, appoint a competent and experienced interface manager ("**Interface Manager**"). The Interface Manager shall, on behalf of the relevant PDP, act as the single point of contact on the design and management of relevant Interfaces with the Purchaser, the Purchaser Interface Manager, other relevant PDPs and Interface Managers.
- (d) The Manufacturer's Interface Manager shall be responsible for:
 - (i) ensuring Interfaces in relation to the Works are identified, managed and resolved in accordance with the Purchaser's DTUP Interface Management Plan;
 - (ii) assisting with Purchaser to maintain the relevant Interfaces within the Interface Register; and
 - (iii) monitoring the production and agreement of all relevant ICDs.
- (e) The Manufacturer shall prepare an interface management plan to describe how they will manage Interfaces in accordance with the Purchaser's DTUP Interface Management Plan ("**Interface Management Plan**").
- (f) The Manufacturer shall produce a description of all of the Interfaces relating to the Trains and Equipment including, but not limited to:
 - (i) those described in Appendix 1 to this schedule 26;
 - (ii) the relevant Interfaces listed in the Interface Register;
 - (iii) those with Infrastructure Managers;
 - (iv) those with other users of the LUL Network;
 - (v) those with neighbours of the LUL Network and neighbouring railways; and
 - (vi) those with other PDPs,

and the Manufacturer shall submit the Interface descriptions to the Purchaser for Approval within four (4) months of the Commencement Date;
- (g) The Manufacturer:
 - (i) acknowledges that, for the period up to Final Design Submission, there will be up to two PDPs for the Interface(s) relating to the Train-Borne Signalling and that references in this Agreement to the PDP in respect of the Interface(s) relating to the Train-Borne Signalling shall be construed as and

include references to up to two PDPs in respect of the Interface(s) relating to the Train-Borne Signalling; and

- (ii) shall (where relevant) (A) submit separate two sets of the deliverables required by this schedule 26 (where there are two PDPs) indicating to which PDP they relate and (B) liaise with each such PDP.

2.2 Appointment, Roles and Responsibilities of PDPs

- (a) To facilitate the management and progression of the Interfaces, the Purchaser shall assign a lead PDP to each Interface (and, in respect of the Interface(s) relating to the Train-borne Signalling, up to two lead PDPs), as determined initially by the Interface Matrix in Appendix 1 to this schedule 26 (each a "**Lead PDP**"), and later as determined by the Interface Register.
- (b) Where the Manufacturer is a Participating PDP, and the Purchaser is unable to assign a Lead PDP, the Purchaser shall act as the Lead PDP for that Interface.
- (c) When the Manufacturer is Lead PDP and the Purchaser is unable to assign a Participating PDP, the Purchaser shall act as the Participating PDP for that Interface.
- (d) The role and responsibilities where the Manufacturer is Lead PDP shall be as follows:
 - (i) to jointly identify, plan, co-ordinate, agree, finalise and document the necessary Interface requirements (including the Interface Control Document) with relevant Participating PDPs and other interfacing parties (including authorities or agencies that are necessary in the course of Interface design);
 - (ii) to ensure information requested by parties (including Participating PDPs) is received in the correct format and within the agreed timescale;
 - (iii) to manage and own the required Interface document submissions (including ICDs, as necessary) and to submit these to the Purchaser for Approval;
 - (iv) to prepare and submit all Interface design meeting minutes, Interface design progress reports and Interface design issues to the Purchaser for Approval;
 - (v) to provide all required training and information in relation to the operation and maintenance (including fault and failure diagnosis and rectification) of the Interface; and
 - (vi) to assess the safety of the system resulting from the Interface.
- (e) Where the Manufacturer is Lead PDP, the Manufacturer's Interface Manager shall be responsible for:
 - (i) agreeing required deliverables with the Purchaser and other PDPs to define and manage an Interface; and
 - (ii) ensuring information requested by the Purchaser or other PDPs is received in the correct format and within the agreed timescale.
- (f) For each Interface, the Lead PDP and the Participating PDP shall co-ordinate to identify, define and delineate the individual supply scope and Interface

responsibilities of each PDP, and the Purchaser shall procure that PDPs other than the Manufacturer comply with this obligation.

- (g) The roles and responsibilities where the Manufacturer is a Participating PDP shall, as a minimum, be as follows:
 - (i) to provide the necessary information, material, technical expertise and resources required for the Interface design works as may be requested by the Purchaser or Lead PDP;
 - (ii) to identify, agree and establish all necessary Interfaces and the requirements for such Interfaces jointly with the Lead PDP;
 - (iii) to provide the necessary information, material, technical expertise and resources to enable the Lead PDP to provide all required training and information in relation to the operation and maintenance (including fault and failure diagnosis and rectification) of the Interface;
 - (iv) to collaborate fully with the Lead PDP in finalising the Interface resolution, including joint production of the ICDs and other agreed Interface deliverables (which may include Interface design documents and progress reports); and
 - (v) to assess the safety of the system resulting from the Interface.
- (h) Interface Documentation and Submission for Approval:
 - (i) where the Manufacturer is the Lead PDP it shall, in collaboration with the Participating PDPs, prepare a suite of design documents (including the ICD in accordance with paragraph 2.2(i) below) that describe the Interface and include a clear delineation of scope;
 - (ii) the specific deliverables will be agreed between the relevant PDPs and submitted to the Purchaser for Approval. The deliverables shall include (but not be limited to) schematic drawings, mounting arrangements, power/electrical details, port/pin configurations, materials, detailed requirements and other deliverables as the Purchaser shall in its absolute discretion deem necessary;
 - (iii) where the Manufacturer is the Lead PDP, it shall prepare Interface documentation for the Concept Design Submission and such documentation shall be updated for the Preliminary Design Submission and Final Design Submission; and
 - (iv) the proposed Interface designs shall be submitted by the Manufacturer to the Purchaser for Approval as part of the Design Submissions and shall be designed in accordance with the requirements for Integration Testing pursuant to schedule 7 (Testing and Inspection).
- (i) Interface Control Documents:
 - (i) For the purposes of this Agreement, "**Interface Control Document**" or "**ICD**" means the document created to describe the interaction between two technical elements of the DTUP, to be delivered by two PDPs. The ICD will delineate the responsibilities of the PDPs, and will describe a formal agreement between the parties for the resolution of an Interface. The ICD will provide a detailed record of each Interface and therefore create a governing foundation for PDPs to mutually manage their respective designs. The ICD shall contain information including, but not limited to, the following:

- (A) identification of the Interface;
 - (B) reason for the existence of the Interface;
 - (C) a description and identification of mechanical, electrical, electronic, hardware and software interfaces within the interfacing systems;
 - (D) a description of design review, testing, installation and commissioning activities;
 - (E) requirements on the Interface;
 - (F) actions required to resolve the Interface;
 - (G) interaction between the user and the 'interfaced system' or individual systems;
 - (H) capacity and performance constraints on the Interface;
 - (I) standards and compliance;
 - (J) safety requirements;
 - (K) design implications;
 - (L) construction and installation implications; and
 - (M) operations and maintenance implications.
- (ii) where the Manufacturer is Lead PDP, the Manufacturer shall (A) produce the relevant ICDs; and (B) once signed off as agreed between the relevant PDPs, submit such ICDs to the Purchaser for Approval, within six (6) months of the Commencement Date;
 - (iii) where the Manufacturer is a Participating PDP, it shall not be required to produce the ICD, and the Purchaser shall procure that the relevant Lead PDP shall produce the ICD with the assistance of the Manufacturer; and
 - (iv) where a Lead PDP has not been appointed, and the Purchaser is acting as Lead PDP for the relevant Interface pursuant to paragraph 2.2(b) of this schedule 26, the Purchaser shall produce the relevant ICD within six (6) months of the Commencement Date, with the assistance of the Manufacturer.

2.3 Interface Design

- (a) The Manufacturer shall ensure that:
 - (i) each relevant Interface is clearly defined in terms of the requirements of this schedule 26;
 - (ii) all assumptions made within the relevant Interface are documented;
 - (iii) copies of all Interface agreements, records and relevant ICDs are transmitted to the Purchaser Interface Manager; and
 - (iv) when it is Lead PDP, once an ICD has been signed off by the relevant PDPs as agreed, it is submitted to the Purchaser for Approval.

- (b) The Manufacturer shall submit details of each relevant Interface to the Purchaser for inclusion on the Interface Register (with records of agreements from Interface meeting minutes) or, where appropriate, ICDs, in a way that:
 - (i) clearly states and describes the input data required, including the required level of detail, from the relevant PDPs and/or external parties; and
 - (ii) prioritises the Interface issues with respect to the time (deadline) by which this information is required.
- (c) The Manufacturer shall work in a collaborative manner with each PDP identified within each Interface.
- (d) Where the Manufacturer is Lead PDP it shall:
 - (i) create the Interface requirements;
 - (ii) develop and discuss the Interface requirements and their parameters in a collaborative manner with the Participating PDP, and record the outcome appropriately; and
 - (iii) document the review and agreement of Interfaces along with the other affected parties, and include a clear scope delineation between PDPs.
- (e) Where the Manufacturer is Lead PDP, it shall demonstrate to the Purchaser that all risks associated with the relevant Interfaces have been reduced to a level ALARP in the engineering safety case. The Manufacturer shall carry out, and report on, an Interface hazard analysis ("**IHA**") to set out how the engineering safety implications at Interfaces will be adequately addressed and managed. The Manufacturer shall ensure that the IHA involves all relevant PDPs, third parties and the Purchaser.

2.4 Interface Meetings

- (a) In order to progress Interfaces and to ensure Interfaces work, the Lead PDP shall organise and chair regular Interface meetings with the Participating PDP throughout the design, manufacture, test and installation stages.
- (b) At Interface meetings, PDP representatives and any additional technical and/or operational specialists that have been invited to attend, will be required to finalise the Interface design documents for joint review, agreement, sign off and submission to the Purchaser for Approval.
- (c) Within one week of each Interface meeting, where the Manufacturer is the Lead PDP it shall submit any updated design documents to the Purchaser for Approval.
- (d) Each time there is an Interface meeting, the Manufacturer shall provide the Purchaser with reasonable notice (having regard to the nature and location of the meeting) of the date upon which such Interface meeting is due to take place and the Purchaser and/or its nominee shall be entitled to attend.

3. **SYSTEMS INTEGRATION DELIVERABLES**

- 3.1 The Systems Integration Management Plan and supporting plans detail how the Purchaser will facilitate the integration of the projects (supported by PDPs) including the approach to managing Interfaces between PDPs, the Purchaser and external parties. Appendix 1 to this schedule 26 sets out the top level indicative interface matrix ("**Interface Matrix**") indicating the primary level of responsibility for PDPs.

- 3.2 The Manufacturer shall produce the following plans that detail how the Manufacturer shall manage its engineering process:

(a) Systems Engineering Management Plan ("**SEMP**")

The Manufacturer shall document in the SEMP the strategies for how the Manufacturer will align with the methods and tools detailed within the SIMP. It shall be in an agreed form as at the date of this Agreement.

(b) Interface Management Plan ("**IMP**")

The Manufacturer shall detail in the IMP how the Manufacturer will manage the Interfaces included as part of this schedule 26. The Manufacturer shall, no later than six (6) months after the Commencement Date, submit the IMP to the Purchaser for Approval.

4. **DESIGN COORDINATION**

- 4.1 System level reviews ("**SLRs**") will be held before each Assurance Stage to confirm that Interfaces are at the requisite level of maturity. The focus of SLRs shall be on systems integration and design coordination, and SLRs shall, subject to paragraph 4.4 below, require input and attendance from both the Purchaser, Manufacturer and other PDPs.

- 4.2 Requirements, Interfaces, architectures, risks, assumptions, issues, dependencies, design integration and co-ordination evidence will form the agenda of the meetings and the review criteria will be based around the assurance principles of "People", "Process" and "Product". Each of these will be assessed in accordance with the following criteria:

- (a) People – appropriate individuals have been involved in the process of producing and reviewing the system design element;
- (b) Process – the system design elements have been produced in accordance with the corresponding management plans or appropriate standard / guidance. There is evidence of technical and quality reviews and comments have been addressed; and
- (c) Product – the maturity of the system design element meets the criteria for the respective project stage including questions such as:
 - (i) Are we building the right product?
 - (ii) Are we building the product right?

- 4.3 The SLRs will provide a forum for both Purchaser and PDPs to identify any outstanding issues, risks, assumptions and dependencies between PDPs and to understand and query change and impact analysis.

- 4.4 As Prime System Integrator, the Purchaser will be responsible for organising and chairing SLRs. To facilitate a collaborative environment, the Purchaser shall invite representatives from key PDPs, including the Manufacturer, who will be invited to attend each SLR, including those SLRs related to other aspects of the DTUP in which the PDP is not directly contributing to the delivery (so attendance will not be mandated where an SLR does not directly impact or require involvement from the PDP, but this shall be at the Purchaser's absolute discretion). Where the Manufacturer is Lead PDP it shall, and the Purchaser shall procure that the other PDPs shall, appoint competent and experienced individuals with the authority to represent the PDP in all matters pertaining to the SLR including commercial, technical and delivery.

- 4.5 At least four (4) weeks before the date of the SLR the Purchaser will send to the SLR attendees, including the Manufacturer, the agenda for the SLR.

5. PHYSICAL ARCHITECTURES

- 5.1 The Purchaser has prepared a series of Physical Architecture diagrams which show the fundamental properties, concepts, elements and relationships or Interfaces of the Deep Tube Upgrade Programme. The Physical Architectures do not dictate specific solutions, and must not be interpreted by the Manufacturer as designs.
- 5.2 The Physical Architecture diagrams shall be owned and maintained by the Purchaser. The Physical Architectures will evolve with the designs as more information is gathered about solutions and constraints. The Physical Architecture diagrams will contain the accepted terminology in use across the DTUP.
- 5.3 The Manufacturer shall review and assist the Purchaser in developing the Physical Architecture diagrams as the designs are developed and the ICDs are Approved.
- 5.4 The Purchaser shall issue updated versions of the Physical Architecture diagrams included in Appendix 2 to all PDPs.

Appendix 1

Indicative Interface Matrix

System A		System B		Party A Lead Project Delivery Partner	Party B Participating Project Delivery Partner
	DTUP Physical Architecture Object ID		DTUP Physical Architecture Object ID		
Train	OBJ-25	Legacy Piccadilly Line Signalling System	OBJ-02-01	Manufacturer	Purchaser
Train	OBJ-25	Axle Counters	OBJ-07-03	Manufacturer	Purchaser
Train	OBJ-25	Track Circuits	OBJ-07-06	Manufacturer	Purchaser
Train	OBJ-25	Train Stops	OBJ-07-09	Manufacturer	Purchaser
Train	OBJ-25	Colour Light Signals	OBJ-07-10	Manufacturer	Purchaser
Train	OBJ-25	Power Distribution and Substations	OBJ-05	Manufacturer	HV Systems and Distribution*
Train	OBJ-25	Electrical Track Equipment & Traction Supply	OBJ-09	Manufacturer	Purchaser
Train	OBJ-25	Third and Fourth Rail Conductor Rail	OBJ-09-02	Manufacturer	Purchaser
Train	OBJ-25	Permanent Way	OBJ-10	Manufacturer	Purchaser
Train	OBJ-25	Running Rails (Main Line)	OBJ-10-01	Manufacturer	Purchaser
Train	OBJ-25	Check Rails (Main Line)	OBJ-10-05	Manufacturer	Purchaser
Train	OBJ-25	Train Arrestors (Main Line)	OBJ-10-06	Manufacturer	Purchaser
Train	OBJ-25	Rail / Wheel Lubrication	OBJ-10-19	Manufacturer	Purchaser
Train	OBJ-25	Tunnels and Gauging		Manufacturer	Purchaser
Train	OBJ-25	Train-borne RCS S&TC Antenna	OBJ-25-01	RCS S&TC*	Manufacturer
Train	OBJ-25	Balise Reader	OBJ-25-02	RCS S&TC*	Manufacturer
Train	OBJ-25	Train-borne Automatic Train Protection (ATP)	OBJ-25-05	RCS S&TC*	Manufacturer
Train	OBJ-25	Train-borne Automatic Train Operation (ATO)	OBJ-25-32	RCS S&TC*	Manufacturer
Train	OBJ-25	Train Radio Unit	OBJ-26-08	Manufacturer	Purchaser
Train	OBJ-25	Rail Monitoring (ATMS)	OBJ-28-05	Manufacturer	Purchaser
Train	OBJ-25	Train-borne RCS OCS	OBJ-25-08	RCS OCS*	Manufacturer
Train	OBJ-25	Recovery Train Interface	OBJ-25-31	Manufacturer	Purchaser
Train	OBJ-25	Train-borne RCS OCS Antenna	OBJ-25-42	RCS OCS*	Manufacturer
Train	OBJ-25	Digital Advertising (Wi-Fi)	OBJ-29-06	Purchaser	Manufacturer
Train	OBJ-25	Stopping Markers	OBJ-31-06	Purchaser*	Manufacturer

System A		System B		Party A Lead Project Delivery Partner	Party B Participating Project Delivery Partner
	DTUP Physical Architecture Object ID		DTUP Physical Architecture Object ID		
Train	OBJ-25	Wheel Lathe	OBJ-38-01	Depots & Stabling*	Manufacturer
Train	OBJ-25	Shore Traction Supply	OBJ-39-01	Depots & Stabling*	Manufacturer
Train	OBJ-25	Train Maintenance Areas	OBJ-45	Depots & Stabling*	Manufacturer
Train	OBJ-25	Train Wash	OBJ-45-03	Depots & Stabling*	Manufacturer
Train	OBJ-25	Automatic lineside inspection equipment	OBJ-45-05	Manufacturer	Depots & Stabling*
Train	OBJ-25	Train Stabling Areas	OBJ-44	Depots & Stabling*	Manufacturer
Train	OBJ-25	Adhesion Management System	OBJ-50-01	Purchaser	Manufacturer
Train	OBJ-25	Fluids and Consumables Replenishment	OBJ-55	Depots & Stabling*	Manufacturer
Train	OBJ-25	Train Cleaning Facilities	OBJ-56	Depots & Stabling*	Manufacturer
Train	OBJ-25	Synchronised (Whole Train) Lifting Equipment	OBJ-59-02	Depots & Stabling*	Manufacturer
Train	OBJ-25	Underframe Component Drop Facility	OBJ-59-04	Depots & Stabling*	Manufacturer
Train	OBJ-25	Heavy Train Maintenance Equipment	OBJ-60-02	Depots & Stabling*	Manufacturer
Train	OBJ-25	Mechanical Gap Filler (Active)	OBJ-32-02	Safe PTI*	Manufacturer
Train	OBJ-25	Platform Edge Doors (PEDs)	OBJ-32-04	Safe PTI*	Manufacturer
Train	OBJ-25	Manual Boarding Ramp		Manufacturer	Purchaser
Train	OBJ-25	OPO CCTV Receiver	OBJ-591	OPO*	Manufacturer
Train	OBJ-25	OPO CCTV Antenna		OPO*	Manufacturer
Train	OBJ-25	GoA2 Train-borne Position Verification	OBJ-594	RCS S&TC*	Manufacturer
Off Train Comms	OBJ-601	LU Data Network	OBJ-04-05	Purchaser	Manufacturer
Train	OBJ-25	Network Rail (especially on Bakerloo line)		Manufacturer	Network Rail
Train	OBJ-25	Non-signalling EMC		Manufacturer	Purchaser

Notes:

1) Where indicated thus*, Party A and B are the Purchasers' 'Project Delivery Partner' contracted to supply the system indicated.

2) OBJ-[unique number] is the reference ID assigned to systems, sub-systems, assets or data networks detailed in the Purchasers' Physical Architecture drawing. Object information such as the object's asset group may be inferred from the reference ID, however objects in the Purchasers' Physical Architecture may not be numbered in order of appearance on the drawing.

APPENDIX 2

Piccadilly Line Physical Architecture

Included on CD entitled "DTUP – MSA LUL Documents".

SCHEDULE 27

Cyber Security

1. DEFINITIONS

For the purposes of this schedule 27, the following words and expressions shall have the following meanings:

"Access Control Lists" means the table that tells a computer operating system which access rights each user has to a particular system object, such as a file directory or individual file;

"Access Layer" means the lowest layer of the hierarchical network design model, providing local network access to hosts or endpoints (also known as the **"desktop layer"**);

"Achieved Security Level" means actual levels of security for a particular system, measured after a system design is available or when a system is in place. They are used to establish that the system security is meeting the goals that were originally set out in the Target Security Level;

"Cell Security Zone" means Control Hierarchy Levels 0, 1 and 2 of the PERA reference architecture comprising "Operational Technology" networks, and local control applications for the control and monitoring of process devices. Within London Underground, a Cell Security Zone can be considered as being equivalent to a station, a signalling equipment room, a communications equipment room, electrical sub-station, Train, etc.;

"Computer Based Engineering Asset" means any engineering asset containing software, firmware, programmable hardware devices or data links;

"Control Hierarchy Level(s)" means those levels that define the specific functions and domains of control, operations and other business systems within manufacturing/industrial organisations as per the PERA model;

"Core Layer" means the highest layer of the hierarchical network design model, providing optimal transport between sites using high speed switching (also known as the **"backbone"** or **"foundation network"**);

"Cyber Security Management Plan" or **"CSMP"** has the meaning given in paragraph 3.2 of this schedule 27;

"Data Diode" means a unidirectional gateway implemented at the physical layer;

"Distribution Layer" means the middle layer of the hierarchical network design model, which provides routing and policy based connectivity (also known as the **"workgroup layer"**);

"Enterprise Security Zone" means Control Hierarchy Levels 4 and 5 of the PERA reference architecture, comprising IT networks, business applications, servers, and clients. Within London Underground, an Enterprise Security Zone can be considered as being equivalent to the corporate IM network;

"Information Technology" means computer based assets and supporting network infrastructure for commercial decision making, planning, business process management, and resource allocation;

"Manufacturing Security Zone" means Control Hierarchy Level 3 of the PERA reference architecture, comprising Operational Technology networks and plant wide applications for

the control and monitoring of the industrial process. Within London Underground, a Manufacturing Security Zone can be considered as being equivalent to a centralised control centre for a line, for a number of lines, managing one or more Cell Security Zones;

"Operational Technology" means the hardware and software that detects or causes a change through the direct monitoring and/or control of physical devices, processed and events in the enterprise;

"Penetration Testing" means the tools and techniques for testing a computer system, network or web application to find vulnerabilities that an attacker could exploit;

"Proxy ARP Protection" means a technique by which a device on a given network answers ARP queries for a network address that is not on that network;

"Security Zone" or "Zone" means a logical grouping of physical, informational, and application assets sharing common security requirements. A security zone has a border, which is the boundary between included and excluded components. The concept of security zone also implies the need to access the assets in a security zone from both internal and external. There can also be security zones within security zones, or security subzones to provide layered security;

"Statement of Applicability" or "SOA" means a document which identifies the controls chosen for the relevant environment, and explains how and why they are appropriate. The SOA is derived from the output of the risk assessment/risk treatment plan and, if ISO27001 compliance is to be achieved, must directly relate the selected controls back to the original risks they are intended to mitigate;

"Target Security Level" means the desired level of security for a particular system, usually determined by performing a risk assessment on a system and determining that it needs a particular level of security to ensure its correct operation; and

2. GLOSSARY

Acronym	Description
AES	Advanced Encryption Standard
ARP	Address Resolution Protocol
BIOS	Basic Input/Output System
CBC	Cipher Block Chaining
CCMP	Counter Mode CBC-MAC Protocol
CISSP	Certificate Information Security Professional
CPNI	Centre for the Protection of National Infrastructure
CPU	Central Processor Unit
DMZ	De-Militarised Zone
DoS	Denial of Service
DSA	Digital Signature Algorithm
DVD	Digital Video Disc
EAP	Extensible Authentication Protocol
EAP-TLS	Extensive Authentication Protocol – Transport Layer Security
FHRPs	First Hop Redundancy Protocols
GICSP	Global Industrial Cyber Security Professional

Acronym	Description
HIDS	Host Intrusion Detection System
IM	Information Management
IP	Internet Protocol
IT	Information Technology
MAC	Media Access Control
MitM	Man in the Middle
NIDS	Network Intrusion Detection System
OS	Operating System
PDP	Project Delivery Partners
PERA	Purdue Enterprise Reference Architecture
RSA	Rivest-Shamir-Adleman
SCADA	Supervisory Control and Data Acquisition System
SHA	Secure Hash Algorithm
SIL	Safety Integrity Level
SQL	Structured Query Language
SSH	Secure Shell (Protocol)
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
USB	Universal Serial Bus
VLAN	Virtual Local Area Network
VPN	Virtual Private Network

3. INTRODUCTION

- 3.1 The Manufacturer shall provide details of its cyber security organisation with clearly defined roles and responsibilities.
- 3.2 The Manufacturer shall provide the Purchaser with a cyber-security management plan ("**Cyber Security Management Plan**"). The CSMP shall describe how cyber security will be managed throughout the project lifecycle and demonstrate that sufficient provisions have been made for the management of security following completion of the Works.
- 3.3 The CSMP shall cover two distinct areas and include the corresponding sets of controls:
- (a) For the Train, Train Driving Simulators, Saloon Mock-up and the TCMS Simulator, the Automatic Lineside Inspection Equipment, the OTC – Infrastructure-Borne Equipment, the CIS edit tool, the CIS simulation tool, the digital advertising edit tool, the computer based train wiring search tool and similar equipment, the engineering asset security controls defined in Appendix 1 (Cyber Security Requirements) and Appendix 2 (Secure Network Engineering) shall be applied.
 - (i) The CSMP shall provide an overview management plan for performing structured risk-based analyses, identifying electronic security risks and vulnerabilities, and evaluating and mitigating risks throughout the project lifecycle. The plan shall address the progressive review and proactive mitigation of the electronic security risks and vulnerabilities of the project.
 - (A) The Manufacturer shall also adhere to the following policies and standards:
 - (aa) CPNI "Security for Industrial Control Systems Framework" good practice guide;
 - (bb) "IEC 62443 Industrial Communication Networks Network and System Security" series of Standards; and
 - (cc) "Rail Cyber Security – Guidance to Industry" published by the Department for Transport.
 - (b) For the off-train maintenance and diagnostic tool and interfaces and similar equipment, the information security management controls established within "ISO27001:2013 Information Security Management Systems" and associated artefacts shall be applied.
- 3.4 The applicability of each set of controls to equipment and systems on the Train and Equipment shall be Approved by the Purchaser during the Preliminary Design Phase and the Final Design Phase.
- 3.5 The CSMP shall also address the management of the vulnerabilities, controls and mitigations with regard to Interfaces between the Manufacturer and PDPs, in conjunction with the Interface Management Plan.
- 3.6 The CSMP shall be submitted to the Purchaser for Approval within 12 months of the date of this Agreement and subsequently at each Assurance Stage.

Appendix 1: Cyber Security Requirements

1. CYBER SECURITY - GENERAL

1.1 Requirements

- (a) The Manufacturer shall provide physical and cyber security features, including, but not limited to, authentication, encryption, access control, event and communication logging, monitoring and alarming, in order to protect the Trains and Equipment from unauthorised modification or use.
- (b) The Manufacturer shall clearly identify the physical and cyber security features and provide the methodology for maintaining such features, including the methods to change settings from the Manufacturer-configured or manufacture default conditions.
- (c) The Manufacturer shall verify that the addition of security features to the Trains and Equipment does not adversely affect connectivity, latency, bandwidth, response time, and throughput.
- (d) The Manufacturer shall remove or disable all software components that are not required for the operation and maintenance of the Trains and Equipment prior to the Type Test.
- (e) The Manufacturer shall verify and provide documentation that any Manufacturer-configured or manufacture default accounts, usernames, passwords, security settings, security codes, and other access methods are changed, disabled, or removed.
- (f) The Manufacturer shall provide, until the end of the Train Warranty Period for the relevant Fleet, appropriate software and service updates and/or workarounds to mitigate all vulnerabilities associated with the Trains and Equipment and to maintain the established level of system security.
- (g) The Manufacturer shall disable by hardware and software means all unused ports and input/output devices.
- (h) Until the end of the Train Warranty Period, as security issues are identified, the Manufacturer shall provide upgrades and patches to the Trains and Equipment in order to maintain the established level of system security.
- (i) Until the end of the Train Warranty Period, the Manufacturer shall provide immediate notification of known vulnerabilities affecting the Trains and Equipment to the Purchaser, with recommendations regarding mitigation and resolution of such vulnerabilities.

1.2 Type Test requirements

- (a) The Manufacturer shall demonstrate and provide documentation of physical and cyber security features, including but not limited to authentication, encryption, access control, event and communication logging, monitoring, and alarming in order to protect the device and configuration computer from unauthorised modification or use.
- (b) The Manufacturer shall demonstrate and provide documentation that all validated security updates and patches are installed and tested at the start of the Type Test.
- (c) The Manufacturer shall demonstrate and provide documentation to demonstrate that all unused software and services have been removed or disabled.

- (d) Following the Type Test, the Manufacturer shall create a baseline of the system communications and configuration including, but not limited to, cyber security features, software, protocols, ports and services and provide documentation describing each item.
- (e) The Manufacturer shall demonstrate through cyber security scans of the system and provide documentation to demonstrate that the addition of security features does not adversely affect adequate connectivity, latency, bandwidth, response time, and throughput for field communications.

2. **WIRELESS TECHNOLOGY**

2.1 Requirements

- (a) As part of the Final Design Submission, the Manufacturer shall provide specific protocols and other detailed information required for the wireless device to communicate.
- (b) The Manufacturer shall provide documentation on the range of the wireless device and power requirements and the designated frequencies of operation for each device.
- (c) The Manufacturer shall provide any test data (including appropriate analysis) associated with the wireless system.
- (d) The Manufacturer shall remove or disable all software artefacts that are not required for the operation and maintenance of the device prior to the Type Test.
- (e) The wireless device shall provide encryption of radio signals. The Manufacturer shall clearly identify these security devices and methods in order to change them from the Manufacturer-configured or manufacture default conditions.
- (f) The wireless device shall be provided with security devices, such as passwords or security codes, to protect the device from unauthorised modification or use. The Manufacturer shall clearly identify these security devices and methods to change them from the Manufacturer-configured or manufacture default conditions.
- (g) Any Manufacturer-configured or manufacturer default usernames, passwords, or other security codes shall be changed or removed at handover to the Purchaser.
- (h) The Manufacturer shall document the equipment configuration and specifically note any security measures associated with the system (including encryption devices and password protection).
- (i) The Manufacturer shall identify the configuration control options that will enable varying of the security level of the device.
- (j) The Manufacturer shall identify how eavesdropping, MitM and DoS attacks, including spoofing and power attacks, are mitigated with the Manufacturer's technology.
- (k) The Manufacturer shall supply current system configuration to the Purchaser at handover to allow traceability and to ensure no extra services are installed.

- 2.2 Until the end of the Train Warranty Period, the Manufacturer shall provide upgrades and patches to the wireless system as vulnerabilities are identified in order to maintain the identified level of system security in the following Type Test requirements:

- (a) The Manufacturer shall perform an interference rejection test and supply the results with an explanation of the results.
- (b) The Manufacturer shall provide test data with analysis showing that basic attacks, such as malformed packet injection, do not cause the wireless device to crash, hang or otherwise malfunction.
- (c) The Manufacturer shall ensure that the Type Test includes exercising all functionality and examining the input or output, and validating the results.
- (d) The Manufacturer shall run the device continuously during the entire Type Test process.
- (e) The Manufacturer shall verify compatibility of the wireless device with other devices with which the device must interface.

3. **WEB-BASED INTERFACES**

3.1 Requirements

- (a) The Manufacturer shall provide documentation of input sanitisation for all web-form inputs, including, but not limited to, measures for prevention of command injection, SQL injection, directory traversal, "Remote File Include", "Cross-Site Scripting", and buffer overflow.
- (b) The Manufacturer shall follow secure coding practices and reporting for all web-based interface software. This requirement shall include both web applications and web servers.
- (c) The Manufacturer shall provide user configurable and managed passwords for the web-based interfaces.
- (d) The Manufacturer shall provide an independent third-party security code validation of all web-based interface software.

4. **HARDWARE CONFIGURATION**

4.1 Requirements

- (a) The Manufacturer shall disable, through software or physical disconnection, all unneeded communication ports and removable media drives, or provide engineered barriers, and provide documentation to demonstrate the results.
- (b) The Manufacturer shall password protect the BIOS from unauthorised changes unless in the reasonable opinion of the Purchaser this is not technically feasible, in which case the Manufacturer shall document this case and provide mitigation measures to the Purchaser.
- (c) The Manufacturer shall provide to the Purchaser a written list of all disabled or removed USB ports, CD/DVD drives, and other removable media devices.
- (d) The Manufacturer shall configure the network devices to limit access to/from specific locations, where appropriate, and provide documentation of such configuration.
- (e) The Manufacturer shall configure the system to allow the system administrators the ability to re-enable devices if the devices are disabled by software and provide documentation of the configuration.

4.2 Type Test requirements

The Manufacturer shall provide, as a part of the Type Test, demonstration and documentation of the disabled or locked physical access and the removed drives.

5. **CHANGES TO FILE SYSTEM AND OPERATING SYSTEMS PERMISSIONS**

5.1 Requirements

- (a) The Manufacturer shall configure hosts with the lowest privilege file and account access and provide documentation of the configuration.
- (b) The Manufacturer shall configure the necessary system services to execute at the lowest user privilege level possible for that service and provide documentation of the configuration.

5.2 Type Test requirements

The Manufacturer shall provide, as a part of the Type Test, validation and documentation of the permissions assigned.

6. **REMOVAL OF UNNECESSARY SERVICES AND PROGRAMS**

6.1 Requirements

- (a) As part of the Final Design Submission, the Manufacturer shall provide documentation detailing all applications, utilities, system services, scripts, configuration files, databases, and all other software required and the appropriate configurations, including revisions and/or patch levels for each of the computer systems associated with the Trains and Equipment.
- (b) The Manufacturer shall provide a listing of services required for any computer system. The listing shall include all ports and services required for operation, with an explanation or cross reference to justify why each service is necessary for operation.
- (c) The Manufacturer shall remove and/or disable all software components that are not required for the operation and maintenance of the Trains and Equipment prior to Type Test. The Manufacturer shall provide documentation on what has been removed and/or disabled. The software to be removed and/or disabled shall include, but is not limited to:
 - (i) games;
 - (ii) device drivers for network devices not delivered;
 - (iii) messaging services (for example, "**MSN**", "**i AOL IM**");
 - (iv) servers or clients for unused internet services;
 - (v) software compilers;
 - (vi) unused networking and communications protocols;
 - (vii) unused administrative utilities, diagnostics, network management, and system management functions;
 - (viii) backups of files, databases, and programs used only during system development;

- (ix) all unused data and configuration files;
- (x) sample programs and scripts; and
- (xi) unused document processing utilities (for example, Microsoft Word, Excel, PowerPoint, Adobe Acrobat, OpenOffice).

6.2 Type Test requirements

The Manufacturer shall conduct cyber security scans (as a minimum a vulnerability and active port scan, with the most current signature files) on the Trains and Equipment. The result of this scan shall be compared with an inventory of the required services, patching status, and documentation to validate this requirement. Other measures shall include:

- (a) The Manufacturer shall provide for each networked device the following configuration documentation lists:
 - (i) network services required for operation of that device indicating the service name, protocol (for example, TCP and UDP) and port range;
 - (ii) dependencies on underlying operating system services;
 - (iii) dependencies on networked services residing on other network devices;
 - (iv) all of the software configuration parameters required for proper system operation;
 - (v) certified OS, driver, and other software versions installed on the device; and
 - (vi) results found by the vulnerability scans with mitigations carried out by the Manufacturer.
- (b) The Manufacturer shall provide a summary table indicating each communication path required by the system, which shall include the following information:
 - (i) source device name and MAC/IP address;
 - (ii) destination device name and MAC/IP address; and
 - (iii) protocol (for example, TCP and UDP) and port or range of ports.
- (c) The Manufacturer shall perform network-based validation and documentation steps on each device full TCP and UDP port scan on "Ports 1–65535". This scanning needs to be completed during a simulated "normal system operation".

7. **INSTALLING OPERATING SYSTEMS, APPLICATIONS AND THIRD-PARTY SOFTWARE UPDATES**

7.1 Requirements

- (a) The Manufacturer shall establish a software update process equivalent to that in paragraph 11 (Technical Change Control) of schedule 5 (Contract Management).
- (b) The Manufacturer shall provide a patch management process to include policies and procedures for the system after installation. These policies and procedures shall include the patch management process and mitigation strategies for instances when the Manufacturer informs the user not to apply released patches.

7.2 Type Test requirements

- (a) The Manufacturer shall install and update all tested and validated security patches prior to the start of the Type Test.
- (b) The Manufacturer shall verify and provide documentation that all updates have been tested and installed.
- (c) The Manufacturer shall perform security scans (with the most current signature files) to verify that the system has not been compromised during the Testing phase.
- (d) The Manufacturer shall provide documentation of the results of the scans referred to in paragraph (c) above.

8. **DISABLING, MODIFYING OR REMOVING WELL KNOWN OR GUEST ACCOUNTS**

8.1 Requirements

- (a) In the Preliminary Design Submission, the Manufacturer shall state which guest accounts need to be active and those that can be disabled, removed, or modified.
- (b) The Manufacturer shall disable, remove or modify all the guest accounts accordingly.

8.2 Type Test requirements

- (a) The Manufacturer shall demonstrate that the stated accounts have been disabled, removed or modified by examining the log files and validating the results.

9. **HEARTBEAT SIGNALS**

9.1 Requirements

- (a) The Manufacturer shall identify heartbeat signals or protocols and recommend whether any should be included in network monitoring.
- (b) The Manufacturer shall provide packet definitions of the heartbeat signals and examples of the heartbeat traffic if the signals are included in the network monitoring.

9.2 Type Test requirements

- (a) The Manufacturer shall provide, as a part of the Type Test, documentation of the requirements set out in paragraph 9.1 above.
- (b) The Manufacturer shall create a baseline of the heartbeat communications traffic to include frequency, packet sizes, and expected packet configurations.

10. **FIREWALLS**

10.1 Requirements

- (a) The Manufacturer shall provide firewalls and firewall rule sets between network zones.
- (b) The Manufacturer shall provide firewall rule sets and/or other equivalent documentation. The basis of the rule set shall be "deny all," with exceptions explicitly identified by the Manufacturer. Note that this information is deemed by

the Purchaser to be business sensitive and the Manufacturer shall protect it as such.

- (c) The Manufacturer shall provide detailed information on all communications (including protocols) required through a firewall, whether inbound or outbound, and identify each network device initiating a communication.

10.2 Type Test requirements

- (a) The Manufacturer shall run the firewall continuously during the entire Type Test process.
- (b) The Manufacturer shall exercise this functionality, examining the log files, and validating the results.

11. **DATA-DIODES**

11.1 Requirements

- (a) Where appropriate, the Manufacturer shall provide uni-directional data-dioes between network zones.
- (b) The Manufacturer shall provide data-diode configuration settings and/or other equivalent documentation and detailed information on all communications (including protocols) required through a data-diode.

11.2 Type Test requirements

- (a) The Manufacturer shall install and run the data-diode continuously during the entire Type Test process.
- (b) The Manufacturer shall exercise this functionality, examine the data-diode performance, and validate the results.

12. **HOST INTRUSION DETECTION SYSTEMS**

12.1 Requirements

- (a) The Manufacturer shall provide a configured HIDS.
- (b) The Manufacturer shall configure the HIDS such that all system and user account connections are logged. This log will be configured such that an alarm can be passed to the TCMS if an abnormal situation occurs.
- (c) The Manufacturer shall recommend log review and notification software tools.
- (d) The Manufacturer shall configure devices as "append only" to prevent alteration of records for local storage devices.

12.2 Type Test requirements

- (a) The Manufacturer shall run the HIDS during the entire Type Test process and periodically interject applicable malware.
- (b) The Manufacturer shall exercise this functionality, examine log files and validate the expected results.

13. **NETWORK INTRUSION DETECTION SYSTEMS**

13.1 Requirements

- (a) The Manufacturer shall provide a recommended placement of the NIDS within the Trains and Equipment at the Preliminary Design Submission.
- (b) The Manufacturer shall provide traffic profiles with expected communication paths, network traffic, and expected utilisation boundaries for anomaly-based NIDS.
- (c) The Manufacturer shall provide appropriate signatures for signature-based NIDS.
- (d) The Manufacturer shall provide a configured NIDS on the Trains and Equipment as appropriate.

13.2 Type Test requirements

- (a) The Manufacturer shall run the NIDS continuously during the entire Type Test process.
- (b) The Manufacturer shall exercise this functionality, examining the log files, and validating the results.

14. **SESSION MANAGEMENT**

14.1 Requirements

- (a) The Manufacturer shall not permit user credentials to be transmitted in clear text.
- (b) The Manufacturer shall provide the strongest encryption method commensurate with the technology platform and response time constraints.
- (c) The Manufacturer shall not allow multiple concurrent logins, applications to retain login information between sessions, provide any auto-fill functionality during login, or allow anonymous logins.
- (d) The Manufacturer shall provide user account-based logout and timeout settings.

14.2 Type Test requirements

The Manufacturer shall demonstrate during the Type Test process validation of the requirements set out in paragraph 14.1 above.

14.3 Maintenance requirements

- (a) The Manufacturer shall change encryption keys at reasonable intervals commensurate with need.

15. **PASSWORD / AUTHENTICATION POLICY AND MANAGEMENT**

15.1 Requirements

- (a) The Manufacturer shall provide a configurable account password management system that allows for selection of password length, frequency of change, setting of required password complexity, number of login attempts, inactive session logout, screen lock by application, and denial of repeated or recycled use of the same password.

- (b) The Manufacturer shall not store passwords electronically or in Manufacturer-supplied hardcopy documentation in clear text unless the media is physically protected.

15.2 Type Test requirements

The Manufacturer shall demonstrate during the Type Test process validation and documentation of the password and authentication policy and management.

16. **ACCOUNT AUDITING AND LOGGING**

16.1 Requirements

- (a) The Trains and Equipment shall log account activity. This log shall be auditable both from a management (policy) and operational (account use activity) perspective.
- (b) Access to audit trails and log files shall be time stamped, encrypted and controlled.

16.2 Type Test requirements

The Manufacturer shall demonstrate that the Type Test includes validation and documentation of the requirements.

17. **SEPARATION AGREEMENT**

17.1 Requirements

- (a) The Manufacturer shall provide a separation agreement to delineate how Manufacturer employees who have sensitive knowledge of the Purchaser's control systems and who leave their positions or have responsibilities changed will be prohibited from disclosing that knowledge, where disclosure could lead to a reduction in security.
- (b) The Manufacturer shall notify the Purchaser when personnel who have knowledge of the security arrangements in relation to the Trains or Equipment leave or change positions.
- (c) The Manufacturer shall provide detailed documentation on how the security of the Trains and Equipment can be maintained and supported at the end of the Train Warranty Period for this Agreement or the FSA.

17.2 Type Test requirements

The Manufacturer shall demonstrate during the Type Test the ability to change key employee/support personnel access and permissions.

18. **CODING FOR SECURITY**

18.1 Requirements

- (a) During the Concept Design Phase, the Manufacturer shall provide details of the development practices and standards applied to software, including firmware, used to ensure a high level of defence against unauthorised access.
- (b) As part of the Final Design Submission, the Manufacturer shall provide documentation of coding practices used in developing the delivered software.

19. **NOTIFICATION AND DOCUMENTATION FROM MANUFACTURER**

19.1 Requirements

- (a) The Manufacturer shall have a written flaw remediation process.
- (b) The Manufacturer shall provide appropriate software updates and/or workarounds to mitigate all vulnerabilities associated with the flaw until the end of the Train Warranty Period.
- (c) The Manufacturer shall provide notification of any flaws affecting security of the Trains and Equipment as soon as the Manufacturer is made aware of or discovers such flaw. Notification shall include, but is not limited to, detailed documentation describing, for example, the flaw with security impact, root cause, corrective actions.

20. **PROBLEM REPORTING**

20.1 Requirements

- (a) Up to the end of the Train Warranty Period, the Manufacturer shall provide a process to manage problem reports regarding cyber security in relation to the Trains and Equipment.
- (b) The process shall include tracking history and corrective action status reporting.
- (c) The Manufacturer shall review and report their initial action plan within 24 hours of submitted problem reports.
- (d) The Manufacturer shall protect problem reports regarding security vulnerabilities from public disclosure and notify the Purchaser of all problems and remediation steps, regardless of origin of discovery of the problem.
- (e) The Manufacturer shall inform the Purchaser in writing of flaws within applications and operating systems in a timely fashion, and provide guidance to the Purchaser about corrective actions, fixes, or means to monitor for vulnerability exploits associated with the flaw.
- (f) The Manufacturer shall provide an auditable history of flaws with the remediation steps taken for each.

21. **MALWARE DETECTION AND PREVENTION**

21.1 Requirements

The Manufacturer shall provide one of the following two options:

- (a) a host-based application white-listing malware detection scheme for the Trains and Equipment as applicable. If this option is selected, the Manufacturer shall verify adequate system performance for host-based malware detection and quarantine (instead of automatically deleting) suspected infected files. This is the Purchaser's preferred option to be met by the Manufacturer. The Manufacturer shall also test major updates to application white-listing malware detection applications and provide performance measurement data on the impact of using the malware detection applications in an active system. Measurements shall include, but not be limited to, network usage, CPU usage, memory usage and any other impact to normal communications processing; or

- (b) a host-based malware detection scheme for the Trains and Equipment as applicable. If this option is selected, the Manufacturer shall verify adequate system performance for host-based malware detection, quarantine (instead of automatically deleting) suspected infected files, and provide an updating scheme for the signatures. The Manufacturer shall also test major updates to malware detection applications and provide performance measurement data on the impact of using the malware detection applications in an active system. Measurements shall include, but not be limited to, network usage, CPU usage, memory usage and any other impact to normal communications processing.
- 21.2 The Manufacturer shall update malware detection software as required to ensure the system is fit for purpose and effective for the most recent malware released (since these signatures are reactive).
- 21.3 Type Test requirements

The Manufacturer shall record system performance with measurements that include the system with and without malware detection.
- 21.4 The Manufacturer shall verify all media and equipment is scanned under the most current malware detection versions available prior to installation on the Trains and Equipment.
- 22. **SECURE VIRTUAL PRIVATE NETWORKS**

This paragraph applies to any network that is external to the Trains and which communicates with the Trains.
- 22.1 Requirements
 - (a) The Manufacturer shall provide physical and cyber security features, including, but not limited to, multifactor authentication (for example, security token, known key, and/or certificate), encryption, access control, event and communication logging, monitoring and alarming to protect the system and configuration computer from unauthorised modification or use.
 - (b) The Manufacturer shall provide a DMZ outside of the control network for the VPN server to reside.
 - (c) The Manufacturer shall use different authentication methods for establishing control network access and VPN connection.
- 22.2 Type Test requirements
 - (a) The Manufacturer shall verify and provide documentation of physical and cyber security features, including but not limited to multi-factor authentication (for example, security token, known key, and/or certificate), encryption, access control, event and communication logging, monitoring, and alarming to protect the system and configuration computer from unauthorised modification or use.
- 23. **PHYSICAL ACCESS OF CYBER COMPONENTS**
- 23.1 Requirements
 - (a) The Manufacturer shall provide a detailed plan for appropriate physical security mechanisms.
 - (b) The Manufacturer shall provide lockable or locking enclosures for vulnerable components (for example, servers, clients, and networking hardware).

24. **INTRA PERIMETER COMMUNICATIONS**

24.1 Requirements

- (a) The Manufacturer shall verify and provide documentation that physical communication channels are secured from physical intrusion.
- (b) The Manufacturer shall verify and provide documentation that the range of the wireless communications is limited to within the perimeter.

24.2 Type Test requirements

- (a) The Manufacturer shall verify and provide documentation that the range of the wireless communications is limited to the required area.
- (b) The Manufacturer shall verify and provide documentation that the physical intrusion of communication channels is detectable.

25. **NETWORK ARCHITECTURE**

25.1 Requirements

- (a) The Manufacturer shall provide and document secure network architecture where the higher-Security Zones originate communication to less-secure zones.
- (b) The Manufacturer shall provide and document the design for all communication paths between networks of different Security Zones through a suitable security gateway (such as a DMZ or uni-directional gateway).
- (c) The Manufacturer shall verify and document the fact that disconnection points are established between the network partitions and provide to the Purchaser the methods to isolate subnets to continue limited operations.
- (d) The Manufacturer shall provide and document tailored filtering and monitoring rules for all Security Zones and alarms for unexpected traffic.
- (e) The Manufacturer shall provide and document a suitable security gateway (such as a DMZ or uni-directional gateway) that is restricted to communications where all traffic is monitored, alarmed and filtered.
- (f) The Manufacturer shall provide and document outbound filtering and alarms for unexpected traffic through Security Zones.
- (g) The Manufacturer shall define all sources and destinations with enforced communication origination even during restart conditions between Security Zones.
- (h) The Manufacturer shall provide and document suitable security gateway (such as a DMZ or uni-directional gateway) architectures using different products performing the same functionality running in parallel.
- (i) The Manufacturer shall provide and document a mechanism for patching a suitable security gateway (such as a DMZ or uni-directional gateway) architecture running in a parallel configuration without disruption to the other suitable security gateway (such as a DMZ or uni-directional gateway) running in parallel.
- (j) As part of the Preliminary Design Submission, the Manufacturer shall provide network architecture documentation.

25.2 Type Test requirements

- (a) The Manufacturer shall validate and provide documentation that the higher-Security Zones originate communication to less-secure zones.
- (b) The Manufacturer shall document all communication paths, including filtering, monitoring, and staging zones.
- (c) The Manufacturer shall verify and provide documentation of disconnection points between the network partitions and validate the continuity of limited operations.
- (d) The Manufacturer shall verify and provide documentation of tailored filtering and monitoring rules for all Security Zones and validate alarms for unexpected traffic.
- (e) The Manufacturer shall verify and provide documentation of restricted communications through the suitable security gateway (such as a DMZ or uni-directional gateway) and verify that all traffic is monitored, alarmed, and filtered.
- (f) The Manufacturer shall verify and provide documentation of outbound filtering and alarms for unexpected traffic through Security Zones.
- (g) The Manufacturer shall verify and provide documentation of all sources and destinations with enforced communication origination even during restart conditions between Security Zones.
- (h) The Manufacturer shall verify and provide documentation of dual suitable security gateway (such as a DMZ or uni-directional gateway) architectures using different products performing the same functionality running in parallel.
- (i) The Manufacturer shall verify and provide documentation of a mechanism for patching a single suitable security gateway (such as a DMZ or uni-directional gateway) architecture running in a parallel configuration without disruption to the other suitable security gateway (such as a DMZ or uni-directional gateway) running in parallel.

26. CRYPTOGRAPHIC SYSTEMS USAGE

26.1 Requirements

- (a) The Manufacturer shall deploy cryptographic systems to protect the confidentiality, data integrity, authentication, and non-repudiation of devices and data flows of the Trains and Equipment.
- (b) For private key Encryption ("**Symmetric Key Cipher**") the AES block cipher shall be adopted by the Manufacturer. The key length shall be at least 128-bit. As minimum the CBC mode shall be used.
- (c) For key exchange the Diffie-Hellmann algorithm shall be used. The key length shall be at least 3072-bit (group 15).
- (d) For public key infrastructure ("**Asymmetric Key Ciphers**") encryption the RSA algorithm shall be used. The length of the keys shall be at least 3072-bit.
- (e) For public key infrastructure ("**Asymmetric Key Ciphers**") authentication the RSA or DSA algorithms shall be used. The key length shall be at least 3072-bit.
- (f) For hashing or integrity validations the SHA shall be used. The SHA-256 version shall be used as minimum. For file integrity checking, SHA-1 is acceptable.
- (g) For 802.11 based infrastructure the WPA 2 algorithm in enterprise mode, with AES CCMP encryption and EAP-TLS shall be used.

27. **CRYPTOGRAPHIC SYSTEMS OPERATION**

27.1 Requirements

- (a) The Manufacturer shall provide centralised tools and mechanisms to manage the cryptographic material (keys, hashes, certificates, etc.) covering: establishment (creation), deployment, ongoing validations and revocation. The tools and mechanisms shall protect the confidentiality, integrity and availability of the cryptographic material.
- (b) The Manufacturer shall ensure that:
 - (i) the cryptographic system implementation includes the capability for configurable cryptoperiods (life span of cryptographic key usage) using the centralised tools and mechanisms;
 - (ii) the key update tools and mechanisms support remote periodic re-keying of all devices as part of normal system operations. Periods shall be configurable;
 - (iii) emergency re-keying of all devices can be remotely performed using the centralised tools and mechanisms; and
 - (iv) the centralised tools and mechanisms shall provide a method for updating cryptographic primitives or algorithms.
- (c) The Manufacturer shall provide adequate documentation describing the cryptographic systems implemented as well as the appropriate manuals for Operations and Maintenance.

28. **LOGGING MONITORING, AUDITING AND REPORTING**

28.1 Requirements

- (a) The Manufacturer shall ensure that the Trains and Equipment shall have logging capabilities.
- (b) As part of the Preliminary Design Submission, the Manufacturer shall provide a specification list of all log management capabilities that the Trains and Equipment are capable of generating, and the format of the logs. This list shall identify which of those logs are enabled by default.
- (c) As part of the Final Design Submission, the Parties shall agree the logging capabilities to be enabled on the Trains and Equipment.
- (d) As part of the Final Design Submission, the Manufacturer shall describe how the integrity, confidentiality and availability of the files is to be achieved.
- (e) The Manufacturer shall provide mechanisms to allow the extraction of log files in a secure manner.
- (f) The Manufacturer shall provide a centralised software tool to collect all the logs generated by the Trains and Equipment.
- (g) The Manufacturer shall provide adequate mechanisms and techniques to securely extract logs from the centralised software tool.

- (h) The Manufacturer shall provide procedures to securely extract audit trails and/or log files and registers from the Trains and Equipment which generate local audit trails and/or log files and registers.
- (i) The Manufacturer shall provide procedures to modify the logging setup on the Trains and Equipment.
- (j) The OTC Data Tool shall be used to provide the logging analysis and reporting functions of this centralised software tool.
- (k) The centralised software logging tool shall comply with this schedule 27 and be segregated in a dedicated zone from the other Computer Based Engineering Assets following the least privilege principle.
- (l) The centralised software logging tool shall include a graphical user interface which allows log filtering based on source and/or destination of the communications, communications protocols, dates, etc.

29. **AUTHORISED AND UNAUTHORISED DEVICES INVENTORY**

29.1 Requirements

- (a) The Manufacturer shall deploy an automated asset inventory and discovery tool able to build an asset inventory of the Trains and Equipment via communications discovery mechanisms. The tool shall:
 - (i) be deployed and implemented in a way to guarantee that the integrity, availability and confidentiality of the communications are not compromised;
 - (ii) ensure that all legitimate known assets automatically update the inventory system as new approved devices. Once connected, the tool shall generate an alert notifying the asset connection;
 - (iii) maintain and report the inventory of all the systems connected. For every asset, the inventory shall include a categorisation of the asset, communications protocol(s), address(es), device identifiers, and additional details such as operating system version, firmware version, etc.; and
 - (iv) detect unauthorised connected devices and generate alerts displaying the details of the unknown device connected. The alert shall include the categorisation of the asset, communications, protocol(s) address(es), device identifiers and additional details such as operating system version, firmware version, etc.
- (b) The Manufacturer shall provide procedures to modify the inventory list and the assets categorisation for new classes of authorised and unauthorised device.

30. **SOFTWARE INVENTORY AND CONFIGURATION MANAGEMENT**

30.1 Requirements

- (a) The Manufacturer shall implement application white-listing technology that allows systems to run software only if it is included on a white-list, and prevent execution of all other unauthorised software on the Trains and Equipment.
- (b) The application white-listing technology shall provide an alert when unauthorised software attempts to run.

- (c) The Manufacturer shall provide a software tool to report the list of authorised software and versions that are on the Trains and Equipment.
- (d) The Manufacturer shall provide procedures to modify the software included on the whitelist used by the software inventory and configuration management tools.
- (e) The Manufacturer shall provide a process to manage and control any changes to software on the Trains and Equipment. This process shall be compatible with the application white-listing technology provided. This shall include:
 - (i) logging when authorised changes are undertaken;
 - (ii) providing a record of the authorised changes; and
 - (iii) providing a configuration back-up disc image in associated secure storage.

31. **SYSTEM RESTORATION**

31.1 Requirements

- (a) The Manufacturer shall provide disc images of all the Computer Based Engineering Assets. It shall be possible to reimage all the Computer Based Engineering Assets upon SAT completion using these disc images.
- (b) Prior to creation of the disc images, the Manufacturer shall demonstrate that the Computer Based Engineering Assets are free of malware.
- (c) The disc images shall be created upon SAT completion and shall contain the complete configuration details of the hardware, operating system and applications as well as all the security controls implemented and Approved by the Purchaser. To verify the authentication of the disc images, hashing techniques shall be used. The Manufacturer shall follow the directions of the Purchaser in providing the hashes to ensure that the chain of custody is protected.
- (d) The disc images and procedures to rebuild a platform or device from a disc image shall be handed to the Purchaser. Individual procedures shall be provided for Computer Based Engineering Assets where appropriate. The procedures shall contain clear instructions on how to reimage each Computer Based Engineering Asset.
- (e) The Manufacturer shall develop a procedure to demonstrate the absence of malware on platforms, upon their restoration, using the disc images.
- (f) The Manufacturer shall provide procedures to verify the integrity of the disc images created.
- (g) The Manufacturer shall provide procedures to restore an image. Where necessary an individual procedure shall be developed for the Trains and each Equipment.
- (h) The Manufacturer shall supply procedures to verify the absence of malware on the Computer Based Engineering Assets upon its restoration.
- (i) Any Approved change undertaken by the Manufacturer shall require the creation of a new image for the modified asset and the execution of the process to demonstrate that the Trains and Equipment are free from malware.
- (j) The Manufacturer shall supply detailed documentation of the disc images created to allow traceability during the systems restoration process. The documentation shall individually cover every type of Computer Based Engineering Asset procured,

describing the specific details of the associated images and listing all the configuration details, OS and applications as well as all the security controls implemented.

32. **INFORMATION CLASSIFICATION**

- 32.1 The Manufacturer shall adhere to the "TfL Standard – Information Security Classification" for all data and communications relating to Computer Based Engineering Assets. Data relating to Computer Based Engineering Assets shall be classified and treated as confidential by the Manufacturer.

33. **CYBER SECURITY LIFECYCLE MANAGEMENT**

33.1 Requirements

(a) General

- (i) The Manufacturer shall implement a cyber-security programme to address and manage potential security vulnerabilities in each phase of the Works; and
- (ii) The cyber security programme shall include those vulnerabilities that could be exploited by accidental and/or deliberate attacks from either internal or external sources, and shall include those lifecycle phases other than operation and maintenance that might be vulnerable to attacks, such as design and implementation and product selection and procurement.

(b) Risk Management during the project lifecycle

- (i) The Manufacturer shall:
 - (A) develop appropriate cyber security risk treatment plans containing a list of risks prioritised according to the cyber security risk management process principles and the controls to reduce, retain, avoid, or share the risks. The cyber security risk treatment plans shall be updated as a natural output of a risk assessment or discrete risk event; and
 - (B) develop the Statement of Applicability.

(c) Secure Supply Chain (Hardware and Software)

- (i) The Manufacturer shall ensure that risks from Subcontractors are controlled by using adequate plans, policies, procedures and registers to continually demonstrate to the Purchaser the security of the Manufacturer supply chain.
- (ii) The Manufacturer shall ensure that the supply chain controls protect the systems during their physical or logical transport ensuring that the assets are not vulnerable to subversion, including malicious code insertion, counterfeit insertion, and tampering.
- (iii) The process shall demonstrate:
 - (A) chain of custody practises and updated documentation;
 - (B) inventory management (including the location and protection of the physical and logical assets. This paragraph extends to spare parts);
 - (C) information protection;

- (D) secure digital products delivery;
 - (E) trusted channels and controls to ship assets including tamper-proof packaging; and
 - (F) controls to detect unauthorised access and/or alteration throughout the delivery process.
- (d) Secure Development & Testing Environments (Methodologies, Tools and Development & Testing Facilities)
 - (i) The Manufacturer shall demonstrate that the Trains and Equipment are free of malware, vulnerabilities or weaknesses resulting from insecure product development and/or testing processes. The Manufacturer shall establish a secure development and testing framework which shall:
 - (A) ensure that secure development and testing environments (including tools and development facilities) are established for Trains and Equipment development and testing;
 - (B) ensure that secure development and testing processes are established and applied to the Trains and Equipment development and testing;
 - (C) implement all the applicable controls set out in this schedule 27; and
 - (D) state the countries of origin of the products and where the assembly, development & testing are undertaken.
- (e) Incident Management
 - (i) The Manufacturer shall define a process to effectively manage cyber security events during the contract lifecycle with the objective of minimising impacts on it and maintaining or restoring normal operations.
 - (ii) Formal event reporting and escalation procedures shall be implemented.
 - (iii) All the staff involved in the Works shall be trained in the procedures for reporting events that might have an impact on the security of the awarded contract, as well as the Purchaser's operations.
 - (iv) The Manufacturer shall put procedures in place to identify cyber security events and respond to them.
- (f) Vulnerability Management
 - (i) In considering the detection and reporting of new vulnerabilities, the Manufacturer shall implement a technical vulnerability management process to ensure that the cyber security of the Trains and Equipment is maintained.
 - (ii) The vulnerability management process shall define the methodology and procedures to transparently share the information about past, existing, and potential system vulnerabilities. The process applies to all the components procured including third party products.
 - (iii) The Parties shall agree a vulnerability scoring schema to permit the Manufacturer to classify the criticality of new vulnerabilities.

- (iv) The Manufacturer shall routinely provide documentation covering the historical detail of the publicly and non-publicly disclosed vulnerabilities, security breaches of the procured assets, and its supply chain (including Subcontractors). The documentation shall include a description of the breach, its potential security impact, its root cause, and recommended corrective actions involving the procured product.
 - (v) The Manufacturer shall routinely provide an independent assessment of the procured assets certifying the current security status of the products.
 - (vi) The vulnerability management process shall continually ensure, during the contract lifecycle, that the Trains and Equipment are free of vulnerabilities (public and non-public). If vulnerabilities cannot be fixed, the Manufacturer shall implement the appropriate mitigating controls. The mitigating controls shall be validated by an independent party. The time period to implement and test the mitigating controls shall be Approved by the Purchaser.
- (g) Professional Qualifications
- (i) The Manufacturer shall include at least one professional security engineer certified as CISSP and one professional certified as GICSP. Equivalent or superior experience could be accepted by the Purchaser in lieu of these qualifications through the presentation of:
 - (A) professional references;
 - (B) research and development publications, white papers and conferences presentation in industrial control systems cyber security; and
 - (C) additional security certifications and related training (certification of attendance shall be included).
- (h) Final Design
- (i) The Final Design Submission shall:
 - (A) document and validate the required cyber security design features in the Trains and Equipment; and
 - (B) justify interfaces in and between the Trains and the Equipment that are assigned to different Security Zones and domains of trust;
 - (C) confirm that the Interfaces within and between the Trains and the Equipment do not result in an impairment of the cyber security; and
 - (D) confirm that the Interfaces between the Trains and the Equipment and external domains of trust do not result in an impairment of the cyber security.
- (i) Type Testing
- (i) The Manufacturer shall also appoint an independent party with the Approval of the Purchaser to undertake Penetration Testing of the Trains and Equipment during the Type Test. The validation shall consider the Trains and Equipment by itself as well as all the Interfaces. The independent party selected shall receive all the details of the Trains and Equipment under the Type Test. The electronic security tests and the report shall be compliant with "NIST Special Publication 800-115 (SP 800-115)". The reports shall be

divided in three deliverables: executive report, summary report and technical report.

- (ii) The cyber security Type Test shall demonstrate the cyber security of the Trains and Equipment by proving the:
 - (A) absence of vulnerabilities or the effectiveness of the mitigating controls; and
 - (B) confirmation of the expected behaviour of the Trains and Equipment under cyber-attack scenarios in terms of:
 - (I) safety;
 - (II) functionality; and
 - (III) performance.
- (j) Secure Installation or Works
 - (i) Infrastructure associated with Computer Based Engineering Assets shall be protected during installation activities. The plan shall highlight specific cyber security risks of the installation process and the actions taken to reduce them to tolerable levels.
 - (ii) Method statements for installation shall address the cyber security risks, detailing in a step by step basis the actions to be undertaken and, if the plan cannot be completed in a secure way, the required actions to return the Computer Based Engineering Assets to a state within Purchaser's tolerable cyber security risks levels.
- (k) Training
 - (i) The Training Programme shall include the entire cyber security program and cyber security procedures as well as the technical features and implementation details of the solutions developed/deployed during the contract lifecycle.
- (l) Documentation
 - (i) Prior to placing Computer Based Engineering Assets into service, the Manufacturer shall hand a complete set of documentation to the Purchaser encompassing the cyber security program, developed security plans and all the individual artefacts composing them.
- (m) Tools and Development

Tools, development facilities, and processes to be used for maintenance of Trains and Equipment shall have documented evidence provided by the Manufacturer to show that potential security vulnerabilities have been considered by the Manufacturer and shall adhere to the applicable controls of this procurement language policy.
- (n) Disposal and Decommissioning

Procedures shall be put in place by the Manufacturer to address proper retirement of the Trains and Equipment and the disposal or re-use of media in a controlled manner to avoid disclosure of any sensitive information.

Appendix 2: Secure Network Engineering

1. POLICY STATEMENTS

- 1.1 Networks for LU Computer Based Engineering Assets shall form part of, as a minimum, a three-tier architecture, comprising the Enterprise Security Zone, the Manufacturing Security Zone, and the Cell Security Zone, as defined in Appendix A-1: Three-tier Network Architecture.
- 1.2 Networks for LU Computer Based Engineering Assets shall be implemented within the Manufacturing Security Zone or the Cell Security Zone or both, of the three-tier architecture.
- 1.3 Networks for LU Computer Based Engineering Assets shall implement physical segmentation of the Enterprise Security Zone from the Manufacturing Security Zone, using a DMZ or Data Diode, as defined in Appendix A-2: Physical Segmentation – DMZ and Appendix A-3: Physical Segmentation – Data Diode.
- 1.4 Networks for LU Computer Based Engineering Assets shall be classified according to BS EN 50159:2010. The classification shall be determined at an early stage of the design and shall be categorised as follows:
 - (a) Category 1 - consisting of network infrastructure which is under the control of the designer and fixed during the lifetime of the system;
 - (b) Category 2 - consisting of network infrastructure which is partly unknown or not fixed, however unauthorised access can be excluded during the lifetime of the system; and
 - (c) Category 3 - consisting of network infrastructure which is not under the control of the designer, and where unauthorised access has to be considered.

The categorisation shall be Approved by the Purchaser. This categorisation shall be recorded and used to aid the security risk assessment of the combined system comprising network infrastructure and connected assets.

- 1.5 Networks for LU Computer Based Engineering Assets within the Manufacturing Security Zone, or the Cell Security Zone, may be further segmented into additional Security Zones (security sub-zones) based upon connected asset functions, communication flows and interfaces, security controls to be implemented, locations, responsible organisations, etc. and the results of a security risk assessment.
- 1.6 During the Preliminary Design Phase, Target Security Levels for each Security Zone (or security sub-zone) shall be established. The Target Security Levels shall be Approved by the Purchaser.
- 1.7 During the Final Design Phase, the Achieved Security Levels for each Security Zone (or sub-zone) shall be established. The Achieved Security Levels shall be Approved by the Purchaser.
- 1.8 The physical segmentation of the Enterprise Security Zone from the Manufacturing Security Zone shall be enforced through the implementation of dedicated security sub-zones.
- 1.9 The choice of DMZ or Data Diode shall be governed by:
 - (a) the "Safety Integrity Level" of the assets located in the Manufacturing Security Zone;

- (b) the certification of SIL allocated assets to use open transmission systems; and
- (c) the necessity for bidirectional communications between the Enterprise Security Zone and the Manufacturing Security Zone.

Refer to the table in Appendix A-4: Choice DMZ or Data Diode for details.

- 1.10 Communications between and within Control Hierarchy Levels ("**Levels**") in the same Security Zone, shall only be within the same Level or between adjacent Levels (e.g. Level 0 to Level 1 or Level 2 to Level 3). The skipping of one Level is not encouraged but is permitted based on cyber security engineering judgement (e.g. Level 0 to Level 2) and upon the next conditions:

- (a) lower Level initiating the communication;
- (b) upper Level initiating the communication with the application of the appropriate security controls to enforce the "Least Privilege principle" in the interfaces design and implementation between the LU Computer Based Engineering Assets; and
- (c) the Purchaser Approves the proposed communications model.

Refer to Appendix A-1: Three-tier Network Architecture for a description of the Levels within LU Computer Based Engineering Assets network.

- 1.11 Communications between and within Levels in different Security Zones, with different Achieved Security Levels, shall only be within the same level or between adjacent Levels (e.g. Level 0 to Level 1 or Level 2 to Level 3) upon the next conditions:

- (a) justifying where the interface is required for safety, functionality and performance purposes and cannot be implemented in a different way;
- (b) implementing the appropriate security controls to compensate the Achieved Security Levels gap between Security Zones.

The skipping of one level is not encouraged but is permitted based on cyber security engineering judgement (e.g. Level 0 to Level 2) and upon the next conditions:

- (i) lower level initiating the communication;
- (ii) upper Level initiating the communication with the application of the appropriate security controls to enforce the "Least Privilege principle" in the interfaces design and implementation between the LU Computer Based Engineering Assets; and
- (iii) the Purchaser Approves the proposed communications model.

- 1.12 Networks for LU Computer Based Engineering Assets shall not be directly connected to the internet. Computer Based Engineering Assets requiring connectivity to external networks shall implement a hierarchical architecture with layered security controls.

- 1.13 Remote maintenance of Networks for LU Computer Based Engineering Assets shall be via the Enterprise Network (Level 5) and a dedicated security sub-zone hosted at the DMZ.

- 1.14 Network traffic from the enterprise and Manufacturing Security Zones shall terminate in the DMZ security sub-zones. Where architectures based on Data Diodes are in place, this statement does not apply.

- 1.15 Communications between the enterprise and the Manufacturing Security Zones shall be established through the DMZ security sub-zones. Where architectures based on Data Diodes are in place, this statement does not apply.
- 1.16 "Control Protocols" utilised by the LU Computer Based Engineering Assets shall not transverse the DMZ security sub-zones Where architectures based on Data Diodes are in place, this statement does not apply.
- 1.17 Networks for LU Computer Based Engineering Assets shall be comprised of managed devices only, with local and remote logging capabilities based on standard protocols.
- 1.18 Networks for LU Computer Based Engineering Assets shall, where practicable, be managed from the Manufacturing Security Zone. Where this is not practical, within an isolated Cell Security Zone for example, local management from within the Cell Security Zone shall be employed.
- 1.19 Networks for LU Computer Based Engineering Assets shall have their associated infrastructure housed in secure rooms and within locked cabinets. Physical cabling encompassing the entire network (devices, backbone communications, etc.) shall implement appropriate security controls to protect from different threats scenarios such as injection, eavesdropping and denial of service.
- 1.20 Access Layer security controls shall include but are not limited to:
- (a) administratively disabling unused ports;
 - (b) isolation of unused ports configuring them as access ports with non-valid network configuration (i.e. assignment to unused VLANs);
 - (c) blockout devices shall be used to physically disable unused ports;
 - (d) MAC address filtering and port security for used ports;
 - (e) dynamic ARP inspection;
 - (f) ARP protection;
 - (g) automatic discovery protocols hardening and secure configuration;
 - (h) quality of service configuration for resiliency purposes;
 - (i) multicast traffic management for resiliency purposes; and
 - (j) VLAN hardening and secure configuration.
- Exclusions may apply based on the specific details of the combined system comprising network infrastructure and connected assets.
- 1.21 Distribution Layer security controls shall include but are not limited to:
- (a) administratively disabling unused ports;
 - (b) isolation of unused ports configuring them as access ports with non-valid network configuration (i.e. assignment to unused VLANs);
 - (c) blockout devices shall be used to physically disable unused ports;
 - (d) MAC address filtering and port security for used ports;

- (e) dynamic ARP inspection;
- (f) ARP and Proxy ARP Protection;
- (g) FHRPs Hardening and Secure configuration;
- (h) automatic discovery protocols hardening and secure configuration;
- (i) quality of service configuration for resiliency purposes;
- (j) multicast traffic management for resiliency purposes;
- (k) Access Control Lists;
- (l) routing protocols hardening and secure configuration;
- (m) unknown unicast and multicast flood control; and
- (n) VLAN hardening and secure configuration.

Exclusions may apply based on the specific details of the combined system comprising network infrastructure and connected assets

1.22 Core Layer security controls shall include but are not limited to:

- (a) administratively disabling unused ports;
- (b) isolation of unused ports configuring them as access ports with non-valid network configuration (i.e. assignment to unused VLANs);
- (c) blockout devices shall be used to physically disable unused ports;
- (d) MAC address filtering and port security for used ports;
- (e) dynamic ARP inspection;
- (f) Access Control Lists;
- (g) routing protocols hardening and secure configuration;
- (h) source Routing Protection;
- (i) unknown unicast and multicast flood control;
- (j) ARP and Proxy ARP Protection;
- (k) FHRPs hardening and secure configuration;
- (l) automatic discovery protocols hardening and secure configuration; and
- (m) VLAN Hardening and secure configuration.

Exclusions may apply based on the specific details of the combined system comprising network infrastructure and connected assets

1.23 Management plane security controls shall include but are not limited to:

- (a) secure access – login and password;
- (b) secure management access reporting;

- (c) role based access control;
- (d) role base authorisation of actions;
- (e) data confidentiality and secure protocols usage (e.g. SSHv2);
- (f) "Network Time Protocol" hardening and secure configuration;
- (g) session timeouts and keep alives;
- (h) legal notification and banners;
- (i) SNMP v3.0; and
- (j) unused services shall be disabled.

1.24 "Network Intrusion Detection" shall be deployed:

- (a) between the Enterprise Security Zone and the Manufacturing Security Zone; and
- (b) where applicable and practicable, as a compensating control, between Security Zones with different Achieved Security Levels (i.e. communication between manufacturing and Cell Security Zone or communication between Cell Security Zones).

1.25 A network management system ("**NMS**") shall be used to locally manage the network. Remote management of the NMS shall only be permitted if the policies within this document are adhered to.

2. RELATED DOCUMENTS

2.1

Document	Description
PERA – ISA-95	Enterprise Control System Integration
BS EN 62264-1:2013	Enterprise-control system integration. Part 1: Models and Terminology
BS IEC 62443 Series (ANSI/ISA-99)	Security for Industrial Automation and Control Systems

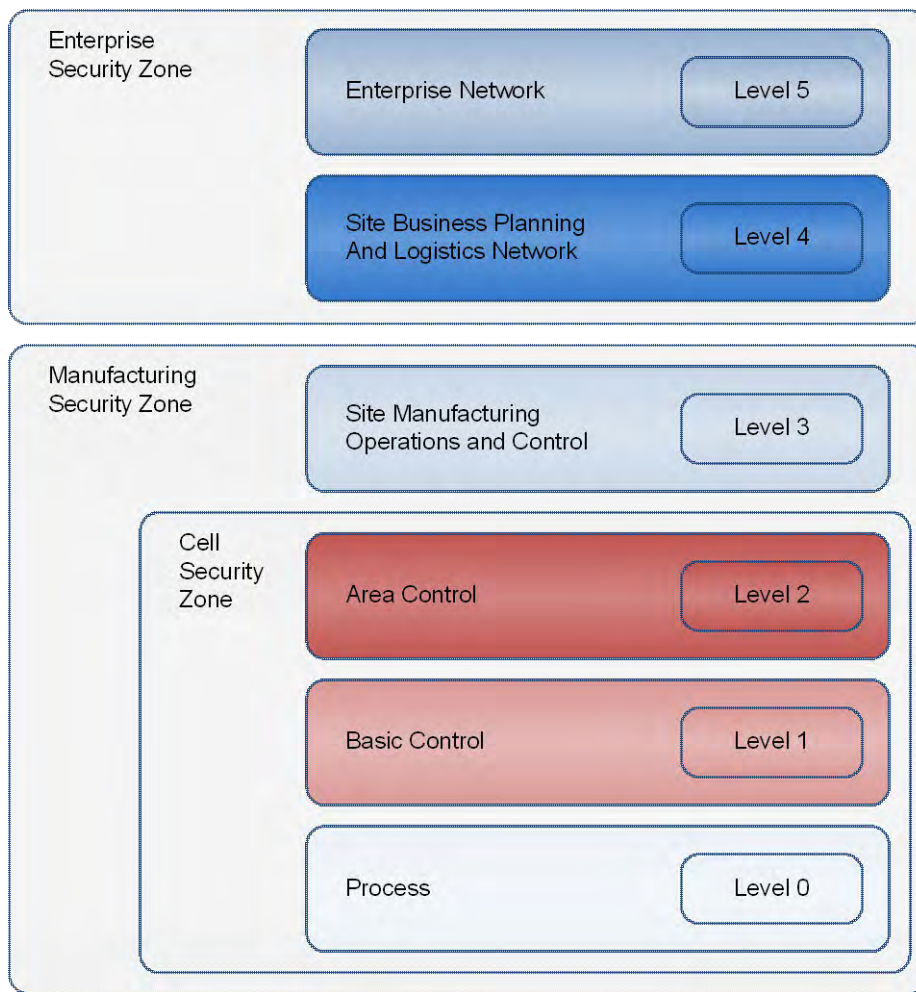
A-1: Three-tier Network Architecture

Figure 1 – PERA – ISA95 reference architecture for IACS showing the boundaries and contents of each of the three-tiers, the Enterprise Security Zone, the Manufacturing Security Zone, and the Cell Security Zone.

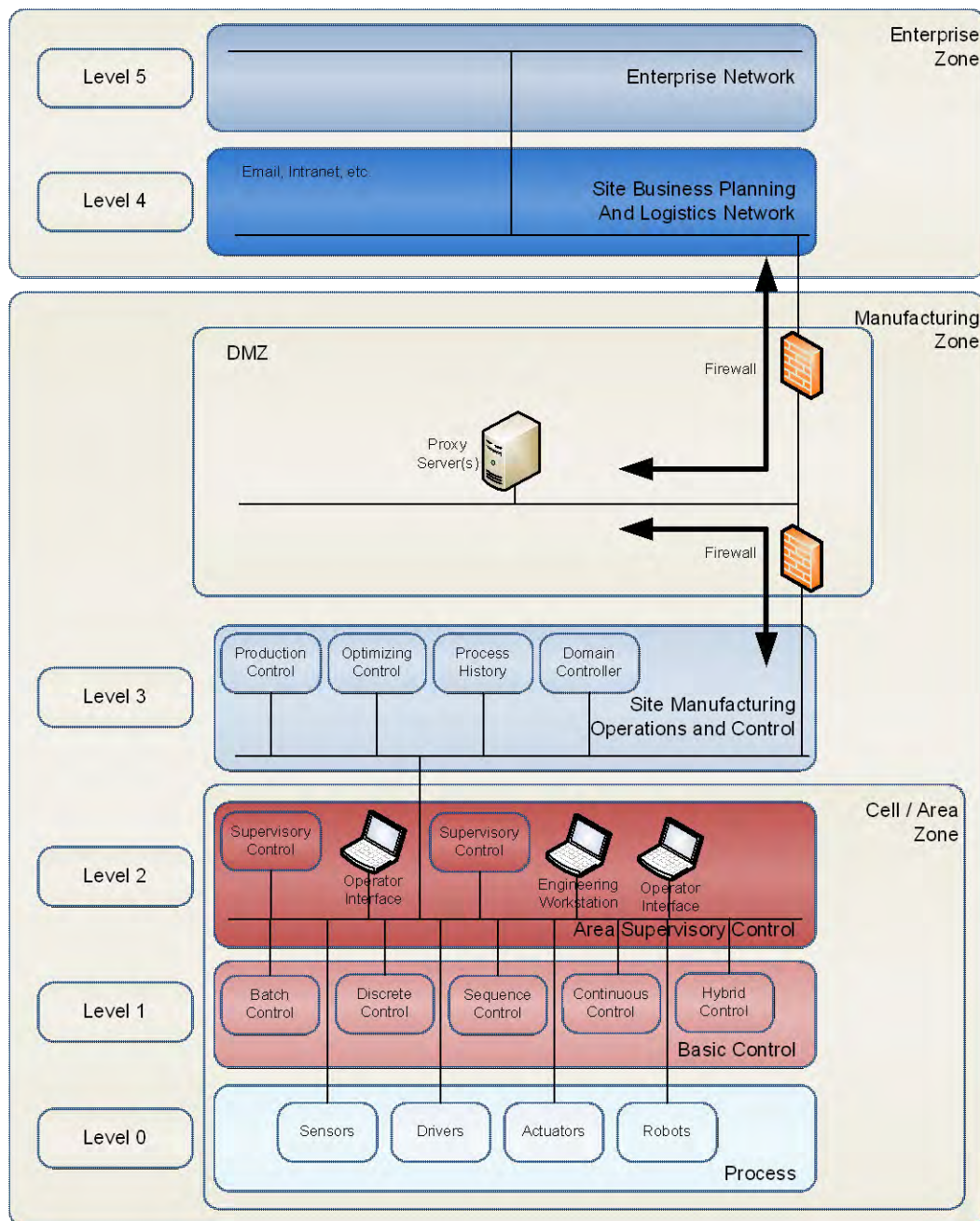
Appendix A-2: Physical Segmentation - DMZ

Figure 2 – PERA – ISA95 reference architecture for IACS showing physical segmentation of the Enterprise Security Zone, from the Manufacturing Security Zone and the Cell Security Zone using a DMZ.

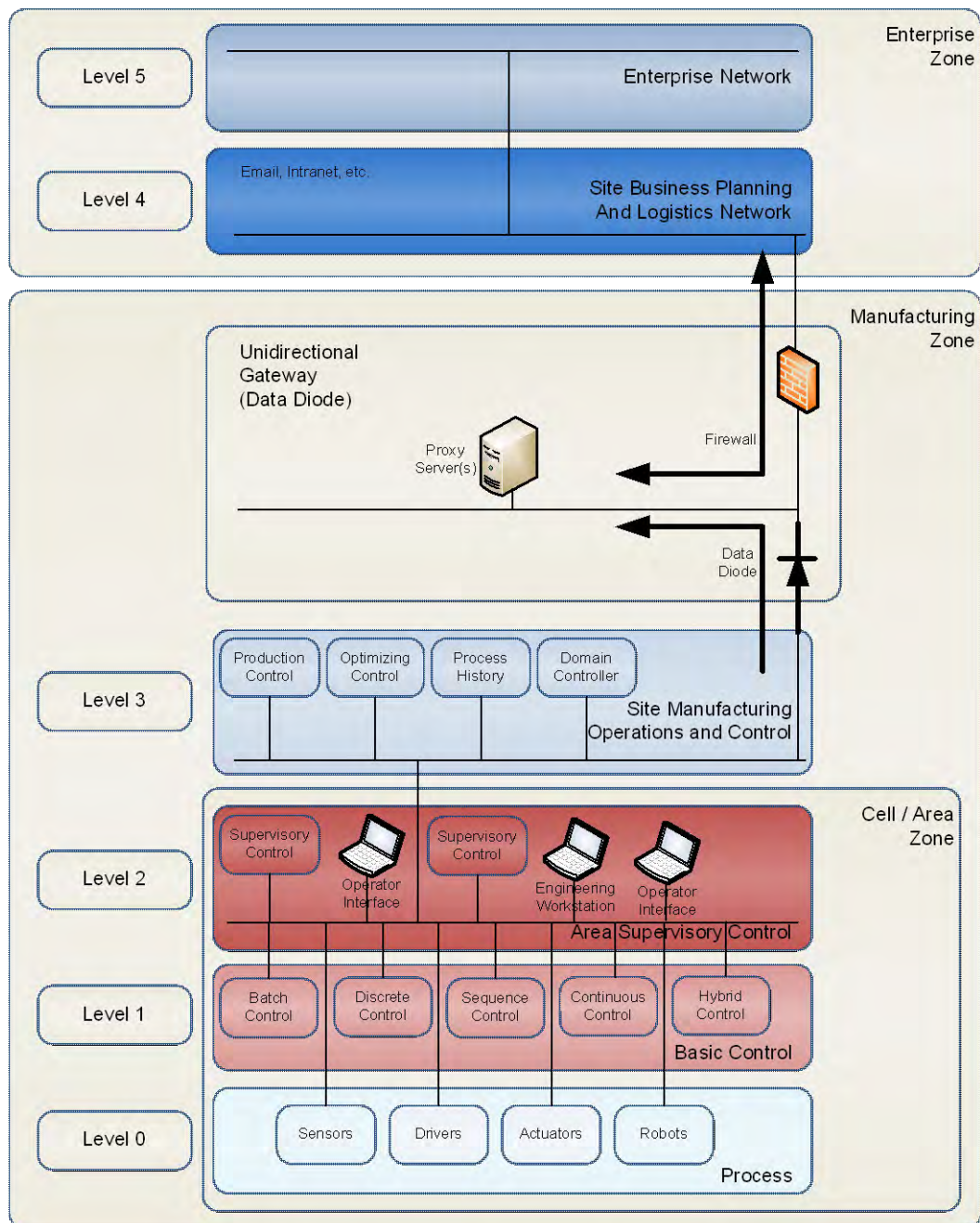
Appendix A-3: Physical Segmentation – Data Diode

Figure 3 – PERA – ISA95 reference architecture for IACS showing physical segmentation of the Enterprise Security Zone, from the Manufacturing Security Zone and the Cell Security Zone using a Data Diode.

Appendix A-4: Choice DMZ or Data Diode

Type of Asset	Signalling Closed (50159)	Signalling Open (50159)	Bidirectional Comms Required
No SIL	DMZ or DD	DMZ or DD	DMZ
SIL 0	DD	DMZ or DD	Not Allowed
SIL 1	DD	DMZ or DD	Not Allowed
SIL 2	DD	DMZ or DD	Not Allowed
SIL 3	DD	DMZ or DD	Not Allowed
SIL 4	DD	DMZ or DD	Not Allowed
No SIL Mission Critical	DD	DMZ or DD	Not Allowed

Table 1 – Choice DMZ or Data Diode Architecture

SCHEDULE 28

Technical Information

1. TECHNICAL DOCUMENTATION – GENERAL

- 1.1 Documentation and technical data shall be provided to enable the maintenance, operation and "technical support" of the Trains and Equipment, including all associated staff training, over the whole life of the Trains and Equipment, and shall include:
 - (a) modification development;
 - (b) reliability improvements;
 - (c) maintenance optimisation;
 - (d) ability to respond to safety related incidents;
 - (e) upgrade;
 - (f) refurbishment; and
 - (g) repairs.
- 1.2 The Technical Documents shall enable the Purchaser to achieve safe operation, maintain and technically support the Trains and Equipment throughout their design life.
- 1.3 The maintenance information shall enable the Trains and Equipment to be maintained such that they continue to meet all of the Train Technical Requirements.
- 1.4 Maintenance documentation provided to the Purchaser by the Manufacturer shall use the component and system indexing in accordance with LUL Standard S1187 "Index of Components for Rolling Stock".
- 1.5 The Technical Documents shall describe how to adjust all of the configurable parameters stated in the Train Technical Specification.
- 1.6 The Manufacturer shall prepare a principles document describing the content format and level of detail for each type of Technical Document deliverable (the "**Technical Principles Document**").
- 1.7 The Technical Principles Document shall be agreed with the Purchaser before the preparation of the Technical Documents begins.
- 1.8 The Technical Principles Document shall be kept updated by the Manufacturer as issues arise and any changes are agreed.
- 1.9 Operational documentation shall be provided by the Manufacturer to support the Train and Equipment service provision and this shall include the following:
 - (a) Operating manual; and
 - (b) Emergency recovery manual.
- 1.10 The Manufacturer shall provide an additional set of documentation in an open format to enable the Purchaser to make changes to the Approved Technical Documents.
- 1.11 All Technical Documents shall be:

- (a) hyperlinked, include an indexing menu structure, searchable by topic and key words;
- (b) provided in a format and style suited to the intended end user(s);
- (c) version controlled; and
- (d) include version and issue date details on each page.

2. **MAINTENANCE DOCUMENTATION SCOPE AND CONTENT**

2.1 The maintenance documentation, which is provided to support the Train Maintenance Regime, shall include the following:

- (a) a Train Maintenance Plan;
- (b) Routine maintenance instructions;
- (c) Component removal and replacement instructions;
- (d) Fault finding guides, for operational and maintenance staff;
- (e) Illustrated parts list;
- (f) "As built" drawings;
- (g) Electrical, pneumatic and software schematics;
- (h) Train and Equipment wiring search tool;
- (i) Equipment overhaul manuals;
- (j) Minimum Acceptable Condition Standards (MACs);
- (k) Technical data summaries;
- (l) Technical descriptions for tools and test equipment;
- (m) Operating instructions for tools and test equipment;
- (n) Maintenance instructions for tools and test equipment;
- (o) Storage Instructions
- (p) Any supplementary information, as required to complete the documentation for the Train Maintenance Regime;
- (q) Breakdown manual; and
- (r) Train and Equipment Design documentation.

2.2 Each element of the maintenance documentation shall be submitted by the Manufacturer to the Purchaser for Approval following Approval of the Train Maintenance Regime.

2.3 The maintenance manual shall detail the tests and checks necessary to prescribe corrective actions or verify fitness for service, following a minor collision incident.

3. **TRAIN MAINTENANCE PLAN**

3.1 The Train Maintenance Plan shall list the intervals of all routine maintenance activities required for the life of the Trains and Equipment. It shall detail:

- (a) title of activity and breakdown of sub-tasks;
- (b) interval at which activity shall be carried out (e.g. service hours, distance run (km), time or number of operations);
- (c) the tolerance limit on the interval for each activity after which the Train and Equipment shall be withdrawn from service until the maintenance has been completed;
- (d) number of staff and staffing level requirements;
- (e) intended location of activity;
- (f) time to complete activity and each sub-task; and
- (g) reference to individual detailed procedure(s).

3.2 It shall include all planned activities including tests, inspections, calibrations, component replacement, component overhaul, condition monitoring activities and any other activities necessary to maintain the Train and Equipment.

4. **DETAILED ROUTINE MAINTENANCE INSTRUCTIONS**

4.1 Instructions shall be provided by the Manufacturer to the Purchaser which describe the individual routine maintenance tasks. Each routine maintenance instruction shall state:

- (a) any safety instructions;
- (b) what constitutes an acceptable condition;
- (c) all values for all settings and adjustments including torque settings for fastenings;
- (d) the process needed to carry out the task;
- (e) all tools and materials needed to complete an instruction;
- (f) methods for using special tools or gauges;
- (g) references to any relevant data about materials (for example handling instructions, potential hazards, storage and disposal);
- (h) the testing needed to confirm that the Train and Equipment are working correctly following the maintenance intervention; and
- (i) warnings to prevent incorrect fitment of similar items of equipment.

5. **COMPONENT REMOVAL AND REPLACEMENT INSTRUCTIONS**

5.1 Instructions shall be provided by the Manufacturer to the Purchaser which describe the replacement and refitting of each Line Replaceable Unit. These shall state:

- (a) any safety instructions;
- (b) the conditions which constitute an acceptable state;

- (c) all tools and materials needed to complete an instruction;
- (d) any methods of using special tools or gauges;
- (e) all values for all settings and adjustments;
- (f) the process needed to carry out the task;
- (g) references to any relevant data about the materials (for example handling instructions, potential hazards); and
- (h) testing needed to confirm that the Train and Equipment are working correctly following the maintenance intervention.

5.2 Instructions shall be provided by the Manufacturer to the Purchaser which describe the replacement and refitting of all components and assemblies that may need to be replaced to rectify a defect on the Train and Equipment or to rectify damage caused by accident or vandalism. These shall state:

- (a) any safety instructions;
- (b) the conditions which constitute an acceptable state;
- (c) all tools and materials needed to complete an instruction;
- (d) any methods of using special tools or gauges;
- (e) all values for all settings and adjustments;
- (f) the process needed to carry out the task;
- (g) all materials needed to complete an instruction;
- (h) references to any relevant data about the materials (for example handling instructions, potential hazards); and
- (i) testing needed to confirm that the Train and Equipment are working correctly following the maintenance intervention.

5.3 Repair procedures shall be provided for Train and Equipment wiring, including the processes needed to repair all plugs and sockets and wiring terminations.

5.4 Replacement procedures shall be provided for pipework.

6. **MAINTENANCE FAULT FINDING GUIDES**

6.1 Fault finding guides shall be provided by the Manufacturer to the Purchaser to assist maintenance staff to identify faults on Train and Equipment systems and components.

6.2 The fault finding guides shall describe the analysis process to identify possible causes and describe the potential remedial actions and repairs to overcome the defect.

6.3 Fault finding guides shall form a logical approach to identifying the fault by adopting a step by step elimination of possible causes.

6.4 The fault finding guides shall identify faults down to a level of component exchange which can be carried out by maintenance staff without recourse to a remote overhaul facility.

7. **EQUIPMENT REPAIR AND OVERHAUL MANUALS**

- 7.1 The Manufacturer shall provide information and an equipment overhaul manual to enable organisations other than the OEM to overhaul all Parts.
- 7.2 The Manufacturer shall provide an equipment repair manual to enable organisations other than the OEM to repair all Parts.
- 7.3 The equipment overhaul manuals shall contain sufficient data to enable the Purchaser to specify the complete technical requirements for the overhaul of all equipment undergoing periodic overhaul. The following specific details are required:
- (a) step by step instructions for undertaking the overhaul with remove and refit documentation to detail fully the process and tooling required;
 - (b) full parts list for the item, including Bills of Materials detailing all items required to complete the overhaul;
 - (c) details of any mandatory component replacement and any mandatory component reconditioning;
 - (d) cautions, warnings and notes;
 - (e) technical drawings of the item to show how to carry out the overhaul instructions including dimensional checks and any reconditioning tasks;
 - (f) any unique methodology requirements (e.g. specific sequence of actions to ensure the safety of the person undertaking the overhaul);
 - (g) details of all tools required; and
 - (h) test pass or fail criteria and procedures.
- 7.4 The equipment repair manuals shall contain sufficient data to enable the Purchaser to specify the complete technical requirements for the repair of all equipment based on predicted failure modes. The following specific details are required:
- (a) step by step instructions for undertaking the repair with remove and refit documentation to detail fully the process and tooling required;
 - (b) a full parts list for the item, including Bills of Materials detailing all items required to complete the overhaul;
 - (c) details of any component replacement and any component reconditioning;
 - (d) cautions, warnings and notes;
 - (e) technical drawings of the item to show how to carry out the instructions including dimensional checks and any reconditioning tasks;
 - (f) any unique methodology requirements (for example, specific sequence of actions to ensure the safety of the person undertaking the overhaul);
 - (g) details of all tools required;
 - (h) test pass or fail criteria and procedures.

- 7.5 Maintenance documentation provided by the Manufacturer shall, without need for recourse to the OEM, include sufficient information to enable all replacement parts or components to be procured, including details of settings and tolerances.

8. NON-STANDARD TOOLS, SPECIAL TOOLS AND TEST EQUIPMENT DOCUMENTATION

- 8.1 For every item in Part B: or Part C: of schedule 8 (Spares and Special Tools), the Manufacturer shall provide details of the tooling manufacturer's name, address and all applicable reference or part numbers for commonly available Non-Standard Tools and gauges.

- 8.2 Technical descriptions shall be provided for all Special Tools and test equipment.

- 8.3 Maintenance instructions shall be provided for the upkeep of Special Tools and test equipment including details of any calibrations, tests and any other activities.

- 8.4 Operating instructions shall be provided for all Special Tools and test equipment.

- 8.5 The Manufacturer shall include the specification of the Non-Standard Tools and Special Tools in the Technical Documents.

- 8.6 The Manufacturer shall provide a full set of manufacturing drawings for all Special Tools.

9. STORAGE INSTRUCTIONS

Storage Instructions shall provide details of any storage instructions for Parts to prevent any deterioration whilst in a storage area. The Storage Instructions shall state the interval for actions to be taken to prevent degradation.

10. TECHNICAL DATA SUMMARIES

- 10.1 A summary of the Train's and Equipment's lubrication requirements shall be provided by the Manufacturer.

- 10.2 A list of the gauges and other specialised tooling required to maintain the Trains and Equipment shall be provided by the Manufacturer.

- 10.3 A list of any materials or chemicals used in the Train and Equipment which are 'substances hazardous to health' as defined in Reference Document 'COSHH Regulations 2002', including their locations and a summary of any special precautions required when dealing with them shall be provided by the Manufacturer.

- 10.4 A list of all equipment settings and characteristics (including tolerances) shall be provided by the Manufacturer, including:

- (a) air pressure settings;
- (b) electrical settings;
- (c) timings for equipment (such as door opening and closing);
- (d) mechanical settings for example bogie frame, solebar and coupler heights above rail level (both following maintenance and absolute values which determine whether or not Train and Equipment will foul the loading gauge);
- (e) Train heights - minimum and maximum above the running rail at both solebar and coupler positions, bogie heights;

- (f) audibility settings, for example maximum and minimum volumes of public address equipment;
 - (g) any circuit breaker settings and fuse ratings;
 - (h) torque chart for fixings and fastenings; and
 - (i) adjustment range for configurable parameters.
- 10.5 A diagram showing car types and the numbering system used for the cars shall be provided by the Manufacturer.
- 10.6 A diagram showing positions of principal items of equipment, such as wheels, bogies, traction motors shoe gear, doors and large equipment such as compressors, shall be provided by the Manufacturer.
- 10.7 A diagram showing the numbering system used on any Train and Equipment components, such as door positions, bogie positions shall be provided by the Manufacturer.
- 10.8 A list of all Train and Equipment parts shall be provided by the Manufacturer, including the part number, location(s), number per Train, number per item of Equipment and details of their associated fixings and their part numbers.
- 11. ELECTRICAL, PNEUMATIC AND SOFTWARE SCHEMATICS**
- 11.1 A full set of Train and Equipment system electrical schematics shall be provided by the Manufacturer.
- 11.2 A full set of Train and Equipment system pneumatic schematics shall be provided by the Manufacturer.
- 11.3 Drawings (colloquially called "car examiners") shall be provided by the Manufacturer which show individual circuits (e.g. safety circuit, lighting circuits). Each drawing shall consist of a single circuit or system for a complete Train and Equipment and for a complete car as applicable. It shall show interfaces with other circuits as appropriate. These are intended to assist understanding and diagnosis of circuit functions.
- 11.4 Software schematics for equipment and systems shall be provided by the Manufacturer to enable the Purchaser to fully understand the parameters and logic of LRU and system functional operation and fault information.
- 12. AS BUILT DRAWINGS**
- 12.1 The Manufacturer shall provide complete 3-Dimensional (3D) computer aided design (CAD) models of the as-built top-level Train assembly and all of its component sub-assemblies and Parts, including electrical wiring and conduits, and pneumatic and hydraulic piping.
- 12.2 The Manufacturer shall provide the 3D design model data files in the following formats:
- (a) ISO 10303-242 (STEP AP242) format; and
 - (b) the native format(s) of the programme with which the 3D model or drawing was created.
- 12.3 The Manufacturer shall ensure that the 3D modelling enables the user to identify critical dimensions and available space for physical interfaces and modifications.

- 12.4 The Manufacturer shall provide complete and detailed arrangement and assembly drawings of the Train in the following formats:
- (a) ISO 10303-242 (STEP AP242) format;
 - (b) the native format(s) of the programme with which the drawing was created; and
 - (c) ISO 19005-1 PDF/A-1 format.
- 12.5 The Manufacturer shall provide complete and detailed wiring diagrams which show the geographical layout and connection of all electrical equipment installed on the Train in the following formats:
- (a) ISO 10303-210 (STEP AP210) format;
 - (b) the native format of the programme with which the diagram was created; and
 - (c) ISO 19005-1 PDF/A-1 format.
- 12.6 The Manufacturer shall provide a full index of all models and drawings in the following formats:
- (a) ISO 10303-242 (STEP AP242) business object model XML format;
 - (b) the native product data management format of the programme with which the design data was created; and
 - (c) ISO/IEC 26300-1 spreadsheet format.
- 12.7 The Manufacturer shall ensure that the drawings and 3D models formally issued to the Purchaser shall comply with LUL Standard S1037 "Computer Aided Design (CAD) Data".
- 12.8 The Manufacturer shall ensure that the drawings formally issued to the Purchaser shall comply with LUL document R0585 version A1 "Production of Rolling Stock Drawings".
13. **ILLUSTRATED PARTS LIST**
- 13.1 The illustrated parts list ("**IPL**") shall graphically define the parts that constitute the Train and Equipment, and how they are assembled to create a Train or item of Equipment. As a minimum, it shall define and detail all Line Replacement Units and consumables which are removed from the Train and/or Equipment.
- 13.2 To identify any item, all part numbers shall be accompanied with an illustration which demonstrates how and where the part is fitted on the Train and/or Equipment or fitted as part of a larger LRU. These may be a mixture of exploded, sectional, cut away or perspective views.
- 13.3 The description of each part in an IPL shall include sufficient information to enable a maintainer to identify a replacement component.
- 13.4 The identification of proprietary items within the IPL such as fixings and fastenings shall provide enough detail to avoid the use of an incorrect but apparently identical part.
- 13.5 The description of each part within the IPL shall include full details of the original component specifications in English.
- 13.6 Manufacturer and OEM part numbers shall be provided in the IPL.

- 13.7 The quantity for each installation and for the Train and Equipment shall be included in the IPL.
- 13.8 Each IPL shall include a link which enables the user to reference to a higher level and, if applicable, lower level within the breakdown of LRUs within the vehicle.

14. MINIMUM ACCEPTABLE CONDITION STANDARDS (MACS)

Minimum Acceptable Condition Standards shall be produced to define acceptable and unacceptable levels of degradation of asset components and systems to determine whether an asset is safe for service. The scope of the MACS shall cover every system and major component for the asset concerned and shall define the minimum acceptable condition, most likely unacceptable conditions, related to wear or functionality, hazardous consequences of any unacceptable condition, category of defect, action to be taken, timescales for the actions.

Grade	Hazard Definition	State of Asset that Grade Represents	Action Required if Hazard Found
A	General observation.	As new or condition just following overhaul.	Record during routine condition inspections.
B	Minor point, not likely to cause a problem.	Acceptable condition after intrusive preventative maintenance.	Fix on next scheduled restoration maintenance activity.
C	Minor defect.	Minimum acceptable condition for the equipment to remain in service.	Fix on next planned maintenance activity.
D	Serious defect, but not a major hazard.	Below minimum condition required for asset to enter service.	Train and Equipment can remain in passenger service until the end of the service day. It cannot be re-offered for passenger service unless it is impractical to rectify the defect immediately. Continued use of asset may be acceptable for a limited period, providing the Purchaser grants Approval and the substandard condition is monitored.
E	Major defect, asset unfit to use.	Below minimum condition required for asset to remain in service.	Remove asset from service until defect has been rectified.
F	Major Safety Hazard, asset unfit to use. Circumstances which allowed this fault to develop to be investigated in depth. The investigation shall include checking a sample of other assets of similar design or with similar Maintenance Regime to determine whether the fault is a one-off incident or exists elsewhere.	A major breakdown in asset integrity, either through design deficiencies or ineffective maintenance.	Remove asset from service. Record in detail the defect. Formally record on the Notifiable Incident Report. Asset not to return to service until defect has been rectified. Report as for E Grade defect and in addition to the Purchaser.

15. **OPERATING MANUAL**

- 15.1 An operating manual ("**Operating Manual**") shall be supplied by the Manufacturer.
- 15.2 The operating information included in the Operating Manual shall enable:
- (a) the Trains and Equipment to be operated safely, within the design criteria;
 - (b) operating staff to be trained to operate the Trains and Equipment;
 - (c) staff to be tested to ensure they are able to operate the Trains and Equipment as required;
 - (d) operating staff to carry out limited fault identification and understand degraded operating modes.

16. **OPERATIONAL FAULT FINDING GUIDES**

- 16.1 Fault finding guides shall be provided by the Manufacturer to assist the Train and Equipment operational staff to identify faults on Train and Equipment systems, where the Train and/or Equipment has not taken corrective action.
- 16.2 The fault finding guides shall identify possible faults that may occur, consequences of the fault, identify a path to recognise possible causes and give a method of overcoming the defect. Fault finding guides shall form a logical approach to identifying the fault by adopting a step by step elimination of possible causes.

17. **EMERGENCY BREAKDOWN MANUAL**

- 17.1 A breakdown manual shall be provided by the Manufacturer for use by the ERU.
- 17.2 The breakdown manual shall include procedures for recovery from derailment, crashes, or following resultant significant damage which means that the Train cannot be moved by routine operational staff. It shall include all credible failure modes identified in the Train design process.
- 17.3 The breakdown manual shall include:
- (a) a description of Train systems, including a description of isolations used during recovery;
 - (b) location of jacking points;
 - (c) procedure for assessing damage and its consequences and potential influence on recovery;
 - (d) procedure for re-railing;
 - (e) procedure for securing damaged equipment, e.g. couplings;
 - (f) procedure for the use of recovery equipment such as skates, airbags, jacks and any limitations on their use; and
 - (g) system defect flow charts.

18. **DESIGN DOCUMENTATION**

18.1 Design information shall be provided to enable a full understanding of the original functional and non-functional requirements of the Train and Equipment and how these have been achieved.

18.2 The technical information shall include:

- (a) data that forms the basis for safety, availability and reliability analyses and supporting data;
- (b) data that describes the criticality of Train and Equipment components to the performance or safety of the system;
- (c) details of failure modes and effects of failures;
- (d) Train Parameters;
- (e) drawings;
- (f) schematics;
- (g) calculations;
- (h) output of computer aided design packages;
- (i) specifications, including acceptance criteria;
- (j) reports, including test reports;
- (k) reviews;
- (l) data, Train and Equipment and interface specifications;
- (m) photographs;
- (n) graphs and tables; and
- (o) technical data and descriptions.

18.3 Data sets shall be provided to enable the Purchaser to populate its Railway Engineering Simulator (RES) and Tunnel Ventilation Model (TVM). This shall include:

- (a) Train dimensions including:
 - (i) Train length over front cab face;
 - (ii) Train length over couplings;
 - (iii) Train length over coupling extremities;
 - (iv) overhand to coupling extremity from leading axles;
 - (v) shoe locations relative to front of Train; and
 - (vi) number of cars per Train;
- (b) response times and delays;
- (c) jerk limits;

- (d) door open and close cycle times;
- (e) Train Performance Characteristics including:
 - (i) Train tare mass in tonnes;
 - (ii) Train full load in tonnes;
 - (iii) per axle tare mass in tonnes;
 - (iv) per axle full load mass in tonnes;
 - (v) Train crush mass in tonnes;
 - (vi) per axle crush mass in tonnes;
 - (vii) number of powered cars per Train;
 - (viii) number of powered axles per Train;
 - (ix) number of axles per Train;
 - (x) allowances for rotating masses;
 - (xi) equivalent mass of rotating parts (%);
 - (xii) tractive effort curves (TE versus Speed and TE versus Current per Train for voltages (400V to 1000V inclusive in 50V increments)) in table and curve formats, specifying wheel diameters;
 - (xiii) efficiency curves for voltages (400V to 1000V inclusive in 50V increments);
 - (xiv) gear ratio for tractive effort curves;
 - (xv) brake effort data, i.e. BE versus speed and BE versus current per Train for voltages (400V to 1000V inclusive in 50V increments) in table and curve formats, specifying wheel diameters;
 - (xvi) motor efficiency data versus speed for each of the operational voltages;
 - (xvii) line current curves excluding auxiliary load for voltages (400V to 1000V inclusive in 50V increments);
 - (xviii) motor current curves for voltages (400V to 1000V inclusive in 50V increments);
 - (xix) regenerated current curves for voltages (400V to 1000V inclusive in 50V increments);
 - (xx) internal motor resistance;
 - (xxi) friction braking characteristic showing blend between dynamic brake and friction;
 - (xxii) Train resistance coefficients, Davis equation parameters for in and out of tunnel; tare and fully laden;
 - (xxiii) front area of the Train body (m²);
 - (xxiv) front area of the Train including underframe and bogie (m²);

- (xxv) perimeter of the front of the car body;
 - (xxvi) skin friction coefficient;
 - (xxvii) front drag coefficient;
 - (xxviii) wheel diameters (new and scrapping);
 - (xxix) traction control characteristics for gap handling;
 - (xxx) predicted annual consumption of auxiliary energy (W/car);
 - (xxxi) auxiliary energy consumption by load;
 - (xxxii) number of braking resistor grids per car;
 - (xxxiii) total weight of brake resistor elements per car (kg);
 - (xxxiv) effective diameter of a brake resistor element (mm);
 - (xxxv) effective surface area for brake resistor convection per car (m²);
 - (xxxvi) effective surface area for brake resistor radiation per car (m²);
 - (xxxvii) emissivity of the brake resistor elements;
 - (xxxviii) specific heat of the brake resistance element (J/(kg-K));
 - (xxxix) brake resistor temperature decay rate;
 - (xl) maximum brake resistor grid temperature (°C);
 - (xli) normal operating range for brake resistor (°C);
 - (xlii) resistor grid fan airflow rate (m³/s); and
 - (xlili) average air velocity across brake resistor elements (m/s);
- (f) information on the Amperage requirements and auxiliary electrical loads of the Train under the following conditions:
- (i) Designated Depot operation:
 - (A) Peak and Route Mean Squared (RMS) current requirements for railing a Train at 450V and 630V, including any feasible current draw variations (e.g. different numbers of motors and auxiliary converters fed);
 - (B) low speed operation in Designated Depot;
 - (C) stabling, in GOA2 and GOA4 modes, both on and off shed-supply;
 - (D) shed receptacle loads, including any variations depending on the number of leads plugged-in and equipment being fed;
 - (E) fault information – time constants and current draw;
 - (F) peak load during any test modes (e.g. any traction testing);

- (G) maximum steady state load during any test modes (e.g. any traction testing); and
 - (H) normal auxiliary loads, including any battery charging;
 - (ii) LUL Network operation, as referenced within the relevant RSTEM; and
 - (iii) any use identified by the Manufacturer which exceeds the scenarios above; and
 - (g) with details of their derivation, any assumptions made, and results of any testing carried out to determine their accuracy.
- 18.4 The Manufacturer shall provide to the Purchaser the full set of Train Parameters necessary to enable the Purchaser to replicate the Manufacturer's model of the dynamic performance of the Train using the VAMPIRE software program.
- 18.5 The Manufacturer shall provide the Purchaser with the Train resistance figures, including details of their derivation and results of testing carried out to determine their accuracy.