

DATED 28th September 2018

LONDON UNDERGROUND LIMITED

and

DELATIM LIMITED

**MANUFACTURE, SUPPLY AND SERVICES
AGREEMENT**

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THIS MANUFACTURE AND SUPPLY AGREEMENT is made on 28th September 2018

BETWEEN:

- (1) **LONDON UNDERGROUND LIMITED**, (Registered No: 1900907) a company incorporated under the laws of England and Wales whose registered office is at 55 Broadway, London, SW1H 0BD (the "**Purchaser**"); and
- (2) **DELATIM LIMITED**, (Registered No: 5475170) a company incorporated under the laws of England and Wales whose registered office is at Unit 33, The IO Centre, Armstrong Road, London, SE18 6RS (the "**Supplier**").

WHEREAS:

- (A) The Purchaser wishes to procure the Goods and Services for use on the London Underground.
- (B) The Purchaser and the Supplier have agreed to enter into an agreement for (among other things) the design, manufacture and supply of the Goods and Services, on the terms and conditions set out hereinafter.

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 for Service**" means in respect of any Goods, that it has been installed on the Train and the Installation Tests have been successfully completed and "Accept for Service" and "Accepted for Service" shall be construed accordingly;

"**Additional Spares**" means Spares for use in planned or unplanned maintenance, an indicative list of which is included in Schedule 3 (*Spares*) Part B (*Additional Spares*) (as may be amended in accordance with the Variation Procedure), to be made available by the Supplier in accordance with Clause 11.4.;

"**Agreement**" means this Agreement including the Schedules;

"**Applicable Laws**" means, as the context may require, all or any laws, statutes, by-laws, codes of practice which have force of law, directives, regulations, Industry Standards, statutory instruments, rules, orders, rules of court, delegated or subordinate legislation, rules of common law or any European Union legislation 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 item of Goods, the Services and/or the Supplier's obligations (including their performance) under this Agreement;

"**Bond Provider**" means a bond provider having a credit rating of at least the Required Rating and having been approved in writing by the Purchaser (in its absolute discretion);

"**CCTV System**" shall have the meaning ascribed to it in Schedule 1A (Specification);

"**Change Date**" means the date set out in the Contract Particulars;

"Change in Law" means the application to any person of any Applicable Laws and/or LU Standards which did not apply to them at the Change Date, or any change in the application or interpretation after the Change Date of any Applicable Laws and/or LU Standards but excluding any Foreseeable Change in Law;

"Commencement Date" means the date specified as such in the Contract Particulars, or if no date is specified, the date specified in a written notice by the Purchaser to the Supplier instructing it to commence the Services under this Agreement;

"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;

"Concept Design" means the concept design more particularly described in Schedule 1A (*Specification*);

"Concept Design Review" means the concept design review more particularly described in Schedule 1A (*Specification*);

"Concept Design Review Approval" means the concept design review approval more particularly described in Schedule 1A (*Specification*) and described as Milestone Payments in Schedule 4 (*Contract Price*);

"Confidential Information" has the meaning ascribed to it in Clause 30.1;

"Consequential Loss" means in relation to a breach of this Agreement or other circumstances in which an Indemnified Party is entitled to recover any costs, expenses or liabilities suffered or incurred, any loss of production, loss of profit, loss of revenue, loss of contract, loss of goodwill, liability under other agreements or liability to third parties and/or indirect or consequential or other financial loss resulting from such breach and whether or not the Party committing the breach knew, or ought to have known, that such indirect or consequential loss would be likely to be suffered as a result of such breach;

"Contract Information" means (i) this Agreement in its entirety (including from time to time agreed changes to this Agreement) and (ii) data extracted from the invoices submitted by the Supplier which shall consist of the Supplier's name, the expenditure account code, the expenditure account code description, the SAP document number, the clearing date and the invoice amount;

"Contract Particulars" means the contract particulars set out in Schedule 16 (*Contract Particulars*);

"Contract Price" means the amount payable by the Purchaser to the Supplier under this Agreement as specified in the Contract Particulars and as further detailed in Schedule 4 (*Contract Price*), as such amount may be amended from time to time pursuant to this Agreement;

"Contract Programme" means the programme set out in Schedule 2 (*Contract Programme*) or, where no programme is so included or the included programme has subsequently been revised (and such revisions have been accepted by the Purchaser), the latest programme accepted by the Purchaser pursuant to Clause 8. The latest programme accepted by the Purchaser supersedes previous Contract Programmes;

"**Contractual Date**" means, in relation to the Goods, the date(s) specified in Schedule 2 (*Contract Programme*) for:

- (A) successfully completing Pre-Installation Inspection and System Test Approval of such Goods; and
- (B) achieving Product Acceptance of such Goods,

"**Corrective Action**" has the meaning ascribed to it in Clause 10.6.1;

"**Declaration**" has the meaning ascribed to it in Clause 54.1;

"**Declaration of Ineffectiveness**" means a declaration of ineffectiveness in relation to this Agreement made by a court of competent jurisdiction in accordance with Regulation 98 of the Public Contracts Regulations 2015 (as amended);

"**Default Interest**" means interest on late payment at the rate of two per cent per annum above the base rate of the Bank of England from time to time;

"**Defect**" means that the Goods or any part of them are defective, damaged, of unsatisfactory quality or not Fit for Purpose whether in consequence of:

- (A) defective materials, workmanship or design;
- (B) transit of the Goods, including from the Supplier's Works into Storage and/or to the Delivery Location, or from Storage to the Delivery Location or from the Delivery Location to the Supplier's Works; or
- (C) any act or omission of the Supplier during the Defect Rectification Period,

and is not principally caused by:

- (i) any failure by the Purchaser or any third party appointed by the Purchaser to use, operate or maintain the Goods in accordance with the Manuals, and/or any Applicable Laws and applicable LU Standards; or
- (ii) vandalism, collision or accidental damage caused by any person other than the Supplier, its Subcontractors or suppliers or the directors, agents, representatives or employees of any of them;

"**Defect Rectification Period**" means (without prejudice to the further provisions of this definition) in relation to Goods installed on a Train and those Parts forming part of the Goods installed on the Train, the period commencing on the date that the Goods have received Product Acceptance and ending on the date of Fleet Acceptance;

"**Delivery Location**" means:

- (A) in relation to the Goods (including the Supplementary Spares), save as detailed in (B) and (C), the relevant delivery location as notified in writing by the Purchaser to the Supplier;
- (B) in relation to the Training Programme and Training Materials the Purchaser's Premises as notified in writing by the Purchaser to the Supplier and to the Purchaser's maintenance team at a location as notified in writing by the Purchaser to the Supplier; or
- (C) in relation to the Design to the Purchaser electronically;

"**Design**" means all design documentation (whether in written or electronic form) produced by or on behalf of the Supplier for the Goods;

"**Design Approval**" means approval of the Design pursuant to Clause 6.3;

"Design Authority" means the entity responsible for ensuring that the Goods and each Part and Spare continues to comply with the Specification and for maintaining Relevant Consents following approved changes to the Design;

"Detailed Design Review" means the detailed design review more particularly described in Schedule 1A (*Specification*);

"Detailed Design Review Approval" means the detailed design review approval more particularly described in Schedule 1A (*Specification*) and described as Milestone Payments in Schedule 4 (Contract Price);

"Dispute" has the meaning ascribed to it in Schedule 10 of this Agreement;

"Environmental Damage" means any material injury or damage to persons, living organisms or property (including offence to man's senses) or any pollution or impairment of the environment resulting from the discharge, emission, escape or migration of any substance or energy, noise or vibration save to the extent any of the foregoing are within the requirements of Schedule 1A (*Specification*);

"Equality & Diversity Infraction" has the meaning ascribed to it in Schedule 17 (*Responsible Procurement*) Part A (*Equality and Supplier Diversity*);

"Escrow Agent" means NCC Escrow International Limited (Company Number 03081952) or any successor or replacement to all or any of its functions;

"Escrow Agreement" means an agreement in the form or substantially in the form set out in Schedule 13 (*Form of Escrow Agreement*);

"Escrow Materials" means the Software, the Source Code and any other such materials notified in writing by the Purchaser to the Supplier that are required by the Purchaser to enable the Purchaser to perform or procure the performance of the Supplier's obligations under this Agreement including, but not limited to, Design drawings, product specifications and quality control measures;

"European Railway Agency" means the European Railway Agency established pursuant to Regulation (EC) No 1335/2008 of the European Parliament and of the Council of 16 December 2008 amending Regulation (EC) No 881/2004 establishing a European Railway Agency (Agency Regulation) and includes any successor to all or any of its functions;

"Excepted Liabilities" means:

- (A) the Supplier's liability for death or personal injury, or fraud, fraudulent misrepresentation or corruption;
- (B) the Supplier's liability for loss suffered or incurred by the Purchaser or any other person to the extent such loss is or is required to be insured by the Supplier in accordance with the provisions of Clause 28;
- (C) the Supplier's liability for Environmental Damage;
- (D) the Supplier's liability for liquidated damages under Clause 13;
- (E) the Supplier's liability in respect of its express obligations in relation to warranty claims and for the rectification of any Defect pursuant to each of the Supplier's obligations under Clause 17;
- (F) the Supplier's liability in respect of any IPRs pursuant to Clause 24.6;

- (G) the Supplier's liability to pay any Taxes as expressly provided by this Agreement or as required by Applicable Law;
- (H) any Default Interest on any payments falling within (A) to (G) above;
- (I) any Losses recoverable under any policies of insurance that the Supplier is required to maintain under this Agreement (or would have been recoverable but for any breach or failure to maintain such insurance), subject to any limits on such Losses stated in Schedule 9 (*Insurance*) and any deductibles payable under such policies;
- (J) the Supplier's liability on termination or cancellation of this Agreement or otherwise to refund and pay to the Purchaser all payments previously paid by the Purchaser in respect of the Goods and Services which are the subject of termination or cancellation in accordance with this Agreement (together with all Default Interest payable on such refund or payment), as such refund is calculated in accordance with Clause 25.5;
- (K) any costs or expenses which the Supplier is obliged or does expend during the term of the Agreement in carrying out its obligations;
- (L) the Supplier's liability in respect of any third party actions, claims, demands, costs, charges and expenses (including legal expenses on an indemnity basis) brought against any Indemnified Party.

"**Fault Free**" means, in relation to Goods which are installed in a Train, that such Goods run without a Defect manifesting itself;

"**Fit for Purpose**" means, in relation to any asset or service to be provided under this Agreement:

- (A) that it complies with all requirements and provisions of this Agreement including the Specification;
- (B) that it complies with all Applicable Laws, Relevant Consents and applicable LU Standards and, to the extent that there is non-compliance with an applicable LU Standard, that there is a valid derogation from that LU Standard; and
- (C) where it is a Part and/or Spare, that if such Part or Spare is incorporated into the Goods, such incorporation does not prevent the Goods from complying with (A) or (B) above;

"**Fleet Acceptance**" means that the Goods comply with the Fleet Acceptance Criteria as evidenced by and occurring upon the issue of a Fleet Acceptance Certificate for the Goods;

"**Fleet Acceptance Certificate**" means a certificate in the form or substantially in the form set out in Schedule 6 (Form of Certificates) Part C (Form of Fleet Acceptance Certificate) issued by the Purchaser in respect of the Goods;

"**Fleet Acceptance Criteria**" means the criteria required to be satisfied in order to achieve Fleet Acceptance of the Goods in accordance with Clause 12.7.2

"**Fleet Acceptance Longstop Date**" means the date specified in Schedule 16 (Contract Particulars);

"**Fleet Mean Distance Between Service Affecting Failure**" has the meaning ascribed to it in Schedule 1A (*Specification*);

"**FM Affected Party**" has the meaning ascribed to it in Clause 27.1.1;

"**FM Notice**" has the meaning ascribed to it in Clause 27.4;

"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, the Department of Constitutional Affairs, or the Department for Environment Food and Rural Affairs (including in each case its successors or assigns) in relation to such legislation;

"Force Majeure Event" means any:

- (A) fire, earthquake or flood;
- (B) act of terrorism;
- (C) war, invasion, acts of foreign enemies, hostilities, civil war, revolutions, insurrection, riots or civil unrest; and/or
- (D) strikes, lock outs or other industrial action not solely affecting the Supplier's and/or their Subcontractors' employees or those of any of its Subcontractors.

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

"Foreseeable Change in Law" means any Change in Law which:

- (A) is a requirement under the Specification;
- (B) is, provided it comes into force in the same or substantially similar form:
 - (i) enacted prior to the Change Date as coming into effect on a specified future date;
 - (ii) in a draft bill or statutory instrument published on or before the Change Date;
 - (iii) in a draft Industry Standard published on or before the Change Date by Transport for London, the Secretary of State for Transport, RSSB, Network Rail, or the European Rail Agency;
- (C) a prudent supplier of CCTV Systems should have reasonably known about on or before the Change Date; and/or
- (D) otherwise arises on or before the Change Date;

"Goods" means the CCTV System, Prototype Goods, Spares, Supplier Documentation and other items to be provided by the Supplier in accordance with this Agreement;

"Government Authority" means any national, supra national (including the European Union) state or local government, any political subdivision thereof or any governmental, quasi governmental, judicial, public or statutory instrumentality, administrative agency, authority, body or other similar entity and including the Office of Rail and Road and the Secretary of State;

"Greater London" means that term as it is used in the Greater London Authority Act 1999;

"Greater London Authority" means the authority 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 company which is a holding company or subsidiary of that company and any subsidiary of any such holding company; for which

purposes "**subsidiary**" and "**holding company**" have the meanings respectively given to them by section 1159 of the Companies Act 2006;

"**Indemnified Parties**" has the meaning ascribed to it in Clause 29.2;

"**Independent Auditor**" has the meaning ascribed to it in Clause 25.10.3;

"**Industry Standards**" means all the laws, rules, regulations, recommendations and instructions, including (without limitation) guidance, codes of practice and conduct which have the force of law or with which it is generally accepted within the United Kingdom rail industry that it is good practice to comply, relating to the performance of this Agreement and/or applicable to the Goods which are or have been issued by the Secretary of State, Network Rail, the Office of Rail and Road, RSSB, or any other Relevant Consents Authority or other person from time to time legally authorised to set standards in respect of the rail industry including the European Railway Agency and shall include, without limitation, the Rule Book, notified National Technical Rules, Railway Group Standards, the Rule Book, Notified National Technical Rules and Technical Specifications for Interoperability;

"**Information**" means information recorded in any form held by or on behalf of the Purchaser;

"**Information Request**" means a request for any Information under the FOI Legislation;

"**Insolvency Event**" in relation to any person means:

- (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 seven (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;

"**Installation Instructions**" means the instructions produced by the Supplier for installing the Goods on to each Train so that it is fully functional in accordance with the Specification;

"**Installation Tests**" means the tests specified by the Supplier to demonstrate the installed system functions as required before Acceptance for Service, as referred to in Schedule 1A (Specification) as Installation Tests and as detailed in Section 12.4

"Installer" means the Purchaser or, such other party as notified to the Supplier in writing in accordance with this Agreement;

"Intellectual Property Rights" or **"IPRs"** means all intellectual property rights in any part of the world, including any patent, rights to inventions, patent application, trade mark and service mark (including any trade, brand or business names), trade mark application, domain names, rights in get-up, rights in goodwill or to sue for passing off, unfair competition rights, design rights, registered design, registered design application, utility model, trade name, discovery, invention, process, formula, specification, copyright and related rights, unregistered design right, technical information or drawing (including rights in software, database rights and topography rights), rights in confidential information (including know-how and trade secrets) and any other intellectual property rights, in each case whether registered or unregistered and including all applications (or rights to apply) for, and renewals or extensions of, such rights and all similar or equivalent rights or forms of protection which subsist or will subsist now or in the future in any part of the world;

"Interface Definition Document" has the meaning ascribed to it in Schedule 1A (Specification);

"Key Date" means the dates, as stated in Schedule 2 (*Contract Programme*) unless later changed in accordance with this Agreement, for:

- (A) achieving Design Approval;
- (B) delivery of the Prototype Goods to the Delivery Location; and
- (C) delivery of the Goods for a Train to the Delivery Location;

"Key Performance Indicators" or (KPIs) means the criteria against which performance under this Agreement will be measured as more particularly described in Schedule 12 (Key Performance Indicators);

"Key Personnel" means the persons listed in Schedule 5 (*Key Personnel*) (or any replacements appointed in accordance with Clause 9.1);

"Late Design Approval" has the meaning ascribed to it in Clause 13.1;

"London Living Wage" means the basic hourly wage current at the date of this Agreement (before tax, other deductions and any increase for overtime) as may be revised from time to time by the Mayor of London or any other body or agency whose directives, decisions, instructions, rulings, laws, or regulations are directly enforceable against the Purchaser;

"Losses" means, in the context of the definition of Excepted Liabilities, any expense, liability, loss, claims, fines, damages, costs (including reasonable legal and other professional fees and disbursements), penalties, settlements and judgments incurred by the Purchaser, its employees or agents or any other person;

"LU Standards" means the various standards documents and associated codes of practice identified in Schedule 1A (*Specification*);

"LUL Network" means the stations and depots (wherever situate), assets, systems, track and other buildings which are used for the maintenance and provision of the underground service known as the London Underground;

"Maintenance Spares" means those Spares listed in Schedule 3 (*Spares*) Part A (*Maintenance Spares*);

"Manuals" means documents which fully describe how the Goods should be operated, serviced, maintained, dismantled, reassembled, repaired and overhauled;

"Mayor of London" means the person elected to hold the office as Mayor of London with the powers and function set out in the Greater London Authority Act 1999;

"Milestone" means, in the case of the Goods, the achievement of each of the stages in the design, manufacture, testing, commissioning, delivery, performance against KPIs, Product Acceptance and Fleet Acceptance of the Goods, in each case as more particularly set out in the table in Schedule 4 (*Contract Price*) Part 4 (*Payment Milestones*);

"Milestone Payment" has the meaning ascribed to it to it in Clause 20.2.4;

"OIL" has the meaning ascribed to it to it in Clause 6.3.3;

"Part" means any equipment, component or furnishing forming part of the Goods or Spare;

"Party" means each of the Purchaser and the Supplier and **"Parties"** shall be construed accordingly;

"Permitted Delay Event" has the meaning ascribed to it in Clause 15.1;

"Payment Certificate" has the meaning ascribed to it in Clause 20.2.4;

"Performance Bond" means, where the Contract Particulars specifies a Performance Bond is required, a performance bond issued by a Bond Provider in favour of the Purchaser in substantially the form set out in Schedule 11 (*Form of Performance Bond*);

"Persistent Breach" has the meaning ascribed to it in Clause 25.4.2;

"Preconditions" has the meaning ascribed to it in Clause 12.6.1;

"Pre-Installation Inspection and Systems Test" means an inspection undertaken in accordance with the pre-installation test specification as identified in Schedule 1A (*Specification*);

"Pre-Installation Inspection and Systems Test Approval" means in relation to any given Goods the issue by the Purchaser of a valid, signed Pre-Installation Inspection and Systems Test certificate (in form and substance similar to that set out in Schedule 6 (*Form of Certificates*) evidencing that the Pre-Installation Inspection and Systems Test has been passed for such Goods, in accordance with this Agreement ;

"Proceedings" has the meaning ascribed to it in Clause 47.2;

"Product Acceptance" means in respect of any Goods, that it complies with the Product Acceptance Criteria as evidenced by and occurring upon the issue by the Purchaser of a Product Acceptance Certificate for those Goods and "Product Accepted" shall be construed accordingly;

"Product Acceptance Certificate" means a certificate in the form or substantially in the form set out in Schedule 6 (Form of Certificates) Part A (Form of Product Acceptance);

"Product Acceptance Criteria" means the criteria as detailed in Clause 12.5.1;

“Production Readiness Review” has the meaning ascribed to it in Schedule 1A (Specification);

“Production Readiness Review Approval” has the meaning ascribed to it in Schedule 1A (Specification) and described as Payment Milestones in Schedule 4 (Contract Price)

"Prohibited Act" means:

- (A) offering or agreeing to give to any servant, employee, officer or agent of the Purchaser or the TfL Group any grant, gift or consideration of any kind as an inducement or reward:
 - (i) for doing or not doing (or for having done or not having done) any act in relation to the obtaining or performance of this Agreement or any other contract with the Purchaser; or
 - (ii) for showing or not showing favour or disfavour to any person in relation to this Agreement or any other contract with the Purchaser;
- (B) entering into this Agreement or any other contract with the Purchaser in connection with which commission has been paid or has been agreed to be paid by the Supplier or on its behalf or to his knowledge unless, before the relevant contract or document is entered into, particulars of any such commission and the terms and conditions of any such contract or document for the payment thereof have been disclosed in writing to the Purchaser;
- (C) committing any offence:
 - (i) under the Prevention of Corruption Acts 1889-1916 and/or the Bribery Act 2010;
 - (ii) under any law or legislation creating offences 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 the Purchaser; or
- (D) defrauding or attempting to defraud the Purchaser;

“Prototype Design Review Approval” as more particularly described in Schedule 1A (Specification) and described as Payment Milestones in Schedule 4 (Contract Price) and as required prior to manufacture of the Prototype Goods;

“Prototype Design Review” shall have the meaning ascribed to it in Schedule 1A (Specification);

“Prototype Goods” means the goods provided as agreed at the Prototype Design Review Approval for the purposes of demonstrating design compliance;

"Prototype Trains" means the trains on which the Prototype Goods will be installed;

“Public Procurement Termination Event” means:

- (A) this Agreement has been subject to any substantial modification that would require a new procurement procedure in accordance with Regulation 72(9) of the Public Contracts Regulations 2015; or
- (B) the Purchaser determines that this Agreement should not have been awarded to the Supplier in view of a serious infringement of the obligations contained under

the EU Treaties and Directives 2014/24/EU of the European Parliament Council dated 26 February 2014;

"Purchaser's Premises" means such premises as owned or occupied by the Purchaser;

"Purchaser Termination Notice" has the meaning ascribed to it in Clause 25.2.2;

"Qualified Product Acceptance" means the qualified product acceptance of any Goods which do not comply in all respects with the Product Acceptance Criteria pursuant to Clause 12.3.1, as evidenced by the issue of a signed QPAC;

"Qualified Product Acceptance Certificate" or **"QPAC"** means a certificate in the form or substantially in the form set out in Schedule 6 (*Form of Certificates*) Part D (*Form of Qualified Product Acceptance Certificate*);

"Railway Group Standards" means, to the extent applicable to the Goods or Goods and their operation:

- (A) technical standards with which railway assets, or equipment used as part of railway assets, must conform; and
- (B) operating procedures with which the operation of railway assets must comply,

known generally as the Railway Group Standards and which are established and maintained by the RSSB and in each case as authorised pursuant to the document known as the Railway Group Standards Code;

"Recurrent Defect" means:

- (A) a Defect in any Spare or Part and which:
 - (i) in any consecutive 12-month period occurs in or affects three or more items of Spares or Parts; or
 - (ii) occurs three or more times in the same Spare or Part in any consecutive 12-month period; or
 - (iii) the Purchaser reasonably believes will occur in or affect three or more items of the same items of Spares or Parts in any 12-month period; or
- (B) any defect, or actual or potential failure (whether relating to safety, reliability or maintainability), occurring in or affecting any plant and machinery, spares or parts provided by the Supplier which is similar to the Goods to be supplied pursuant to this Agreement;

"Relevant Consents" has the meaning ascribed to it in Clause 4.4;

"Relevant Consents Authority" means any or all Government Authorities or any other entity which has the appropriate authority for the granting of a Relevant Consent;

"Relevant Conviction" means any unspent criminal conviction relating to actual or potential acts of terrorism or acts which threaten national security;

"Relevant Individual" means any servant, employee, officer, consultant or agent of the Supplier or any Subcontractor carrying out, or intended to carry out, any aspects of this Agreement on the LUL Network or any other property owned by the Purchaser;

"Remedial Plan" has the meaning ascribed to it in Clause 25.3.1(b);

"**Remedy Notice**" has the meaning ascribed to it in Clause 25.3.1;

"**Required Insurances**" means the insurances specified in Schedule 9 (*Insurance*);

"**Required Rating**" means a long term, stable credit rating of at least "A+" or better from Standard & Poor's or the equivalent rating from Moody's or Fitch;

"**Responsible Procurement Principles**" means the seven principles of responsible procurement more particularly described in the Greater London Authority Group Responsible Procurement Policy dated March 2006, as updated in January 2008 and as may be further updated from time to time and which is available from the Purchaser on request;

"**Retention Period**" has the meaning ascribed to it in Clause 10.3.1(b);

"**Routine Production Tests**" means the tests detailed in the Routine Production Test Specifications;

"**Routine Production Test Specifications**" means the test plan to be developed and provided by the Supplier and agreed with the Purchaser in accordance with Schedule 1A (*Specification*);

"**RSSB**" means the Rail Safety and Standards Board;

"**Secretary of State**" means the Secretary of State for Transport;

"**Saloon Designer**" has the meaning ascribed to it in Schedule 1A (*Specification*);

"**Security**" means:

- (A) any right of ownership, lien, mortgage, charge, pledge, hypothecation, attachment, security interest, assignment by way of security, right of possession, right of detention or other encumbrance; or
- (B) any other preferential arrangement resulting in a secured transaction or having the same economic or legal effect as any of the foregoing; or
- (C) any agreement to give any of the foregoing; or
- (D) any arrangement to prefer one creditor over another creditor; or
- (E) the interest of the vendor or lessor under any conditional sale agreement, lease, hire purchase agreement or other title retention arrangement; or
- (F) any interest described in (A) to (E) above over any interest described in (A) to (E) above;

"**Service Affecting Failure**" means a failure (i) which causes a disruption to the Train service of 120 seconds or greater, or (ii) which requires a Train to be withdrawn from service;

"**Service Affecting Failure Period**" means the period commencing on the date that the first Goods for a Train has been Accepted for Service and ending on Fleet Acceptance;

"**Service Provider**" means the Supplier in its capacity as a party to the SSA;

"**Service Provider Public Procurement Termination Event**" means the Service Provider has, as at the Commencement Date, been in one of the situations referred to in

Regulation 57(1) of the Public Contracts Regulations 2015 and should therefore have been excluded from the procurement procedure in accordance with those regulations;

"**Services**" means the design of the Goods and/or the technical and quality support to be provided by the Supplier in accordance with the Training Schedule, Schedule 3A (*Continuing Support*) and any other support services provided by the Supplier during the term of this Agreement;

"**Software**" means, as may be developed, enhanced, modified, adapted, altered or updated from time to time, the lists of instructions, stored in permanent or semi-permanent form, used:

- (A) to define the functions of microprocessors and similar devices installed on any Goods or any part thereof or in equipment to be used in conjunction with, or for the operation, testing, commissioning, modification and/or refurbishment of, any Goods or any part thereof; and/or
- (B) to run programmes, spreadsheets and/or databases in connection with the operation, testing, commissioning, modification and/or refurbishment of the Goods, in each case except for such as are standard commercial products, usable as made, and which have not been modified in order to perform any of the tasks set out in sub-clause (A) above, which:
 - (i) forms part of the Goods; and
 - (ii) is not Third Party Software;

"**Source Code**" means the source code version of any Supplier-owned Software which is licensed to the Purchaser pursuant to this Agreement in a form capable of being read and interpreted by humans, together with related interpretative documentation and material;

"**Spares**" means all spare parts of any description including fluids, parts and assemblies required in connection with the Goods and Services supplied or to be supplied by the Supplier or any Subcontractor under this Agreement;

"**Specification**" means the specification set out in Schedule 1A (*Specification*), as such requirements may be amended in accordance with this Agreement;

"**Specification Design Review**" means the Specification design review more particularly described in Schedule 1A (*Specification*);

"**Specification Design Review Approval**" means the Specification design review approval more particularly described in Schedule 1A (*Specification*) and described as Payment Milestones in Schedule 4 (*Contract Price*);

"**Storage**" means the storage of the Goods pursuant to Clause 12.2A and Schedule 8 (*Storage*);

"**Storage Option**" has the meaning given to it in Clause 12.2A;

"**SSA**" means the Spares and Support Agreement of even date herewith between the Purchaser and the Service Provider;

"**Subcontract**" means any contract awarded by, or to be awarded by, the Supplier in relation to, or connected with, the carrying out of any of the Supplier's obligations under this Agreement and unless the Contract herein requires otherwise, includes a subcontractor or supplier of any such person;

"**Subcontractor**" means any party to a Subcontract other than the Supplier;

"**Supplementary Spares**" has the meaning ascribed to it in Clause 11.3A.1;

"**Supplier Documentation**" means the documentation to be provided by the Supplier as more particularly described in Schedule 1A (*Specification*) including, but not limited to, the Manuals, the Interface Definition Documents, Installation Instructions, the Training Materials and the Training Programme;

"**Supplier Event of Default**" means any of the events or circumstances listed in Clause 25.1;

"**Supplier Group**" means the Supplier and any member of its Group from time to time;

"**Supplier Guarantee**" means, where the Contract Particulars specifies a Supplier Guarantee is required, the parent company guarantee of the Supplier's obligations under this Agreement provided by the Supplier Guarantor in favour of the Purchaser and substantially in the form set out in Schedule 7 (*Form of Supplier Guarantee*);

"**Supplier Guarantor**" means the Supplier's parent company (if any) identified as such in the Contract Particulars;

"**Supplier IPR**" means any existing or new Intellectual Property Rights owned by the Supplier, any Subcontractor or other third party that:

(A) are used for, or;

(B) arise in connection with,

the performance by the Supplier of its obligations under this Agreement, including design, manufacture, supply, testing, maintenance and delivery of the Goods;

"**Supplier Public Procurement Termination Event**": means the Supplier has, as at the Commencement Date, been in one of the situations referred to in Regulation 57(1) of the Public Contracts Regulations 2015 and should therefore have been excluded from procurement procedure in accordance with those regulations;

"**Supplier Risk Register**" has the meaning ascribed to it in Schedule 1B (*Contract Management*) Part B (*Risk Management*);

"**Supplier's Records**" has the meaning ascribed to it in Clause 10.3.1(a);

"**Supplier's Works**" means the premises specified as such in the Contract Particulars;

"**System Suppliers**" means suppliers of the components for the systems procured by the Purchaser for the Trains other than the CCTV System;

"**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;

"**Tests**" means the tests identified in the Specification to be carried out by the Supplier in accordance with Schedule 1A (*Specification*) and "**Testing**" shall be construed accordingly;

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

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

"**Third Party Software**" means software owned by third parties prior to the Commencement Date which has not been produced in connection with or for the purpose of the Goods;

"**Train**" means four (4) Two-Car Units;

"**Training Programme**" has the meaning ascribed to it in Schedule 18 (*Training*);

"**Training Materials**" means all of the training materials further described in the Training Schedule;

"**Training Schedule**" means Schedule 18 (*Training*);

"**Training Services**" means the training services stated in the Training Schedule to be provided by the Supplier;

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

"**Two-Car Unit**" means a multiple unit in two (2) 92TS car formation on which Goods have been (or will be) installed pursuant to this Agreement, such multiple unit being in one of the following formation variants:

- (A) A-B Unit (comprising one driving motor car and one non-driving motor car);
- (C) B-C Unit (comprising two non-driving motor cars); or
- (D) B-C (D) Unit (comprising one de-icing non-driving motor car and one non-driving motor car);

"**Variation**" means any addition, omission or other change whatsoever to or in respect of this Agreement, including the Specification and/or the Goods and/or any other technical requirement contained in this Agreement;

"**Variation Procedure**" means the variation procedure set out in Clause 23;

"**Variation Quote**" has the meaning ascribed to it in Clause 23.1.1;

"**Variation Valuation**" has the meaning ascribed to it in Clause 23.3.1;

"**VAT**" means

- (A) any tax imposed in compliance with the Council Directive of 28 November 2006 on the common system of value added tax (EC Directive 2006/112); and
- (B) any other tax of a similar nature, whether imposed in a member state of the European Union in substitution for, or levied in addition to, such tax referred to in paragraph (A), or imposed elsewhere; and

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

1.2 Interpretation

In this Agreement, except where the context otherwise requires:

- 1.2.1 any reference to this Agreement includes the Schedules to it, each of which forms part of this Agreement for all purposes;
- 1.2.2 a reference to an enactment, statutory provision or Industry Standard shall unless otherwise expressly specified in this Agreement include a reference to any subordinate legislation made under the relevant enactment, statutory provision or Industry Standard and unless otherwise expressly specified in this Agreement is a reference to that enactment, statutory provision, Industry Standard or subordinate legislation as from time to time amended, consolidated, modified, reenacted or replaced;
- 1.2.3 words in the singular shall include the plural and vice versa;
- 1.2.4 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 an individual's executors or administrators;
- 1.2.5 a reference to a Clause or Schedule (other than to a schedule to a statutory provision) shall be a reference to a clause or schedule (as the case may be) of or to this Agreement and a reference in a Schedule to a paragraph shall mean a reference to a paragraph of that Schedule;
- 1.2.6 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;
- 1.2.7 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;
- 1.2.8 references to writing shall include any modes of reproducing words in any legible form and shall exclude email except where expressly stated otherwise;
- 1.2.9 a reference to "includes" or "including" shall mean "includes without limitation" or "including without limitation";
- 1.2.10 the contents page and headings in this Agreement are for convenience only and shall not affect its interpretation;
- 1.2.11 references to this Agreement include this Agreement as amended, varied or supplemented in accordance with its terms and references to other agreements or instruments shall also be to those as amended, varied or supplemented;
- 1.2.12 a reference to the "Purchaser" or the "Supplier" includes its respective (and any subsequent) successors in title, and its respective permitted transferees or assignees;
- 1.2.13 references in the Agreement 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;

2. NOT USED

3. **PURCHASE**

3.1 **Purchase**

The Supplier shall supply each item of Goods to the Purchaser and perform the Services, in each case by the relevant Key Date or Contractual Date (as applicable) for that item in consideration for the Purchaser procuring payment to the Supplier of the Contract Price in respect of each such item of Goods or such Services, in each case in accordance with the terms of this Agreement.

3A **REPRESENTATIONS AND WARRANTIES**

3A.1 **Supplier's Representations and Warranties**

The Supplier represents and warrants to the Purchaser that as at the date of this Agreement:

3A.1.1 it is validly incorporated and has the power, capacity and legal right to enter into this Agreement and any related ancillary documents to which it is a party and perform its obligations and exercise its rights, hereunder and thereunder and has taken all necessary corporate and other action to authorise the entry into, performance and delivery of this Agreement and any related ancillary documents to which it is a party;

3A.1.2 this Agreement and any related ancillary documents to which it is a party constitute its legal, valid and binding obligations;

3A.1.3 the entry by it into this Agreement and performance of its obligations under this Agreement will not conflict with its constitutional documents, which are true, accurate and up-to-date;

3A.1.4 the entering into or the performance of its obligations or the exercise of its rights under this Agreement and any related ancillary documents to which it is a party will not breach, or cause to be breached, any restriction (whether arising in contract or otherwise), that is binding on the Supplier or any of its assets or undertakings;

3A.1.5 the Supplier has not knowingly provided any information or made any statement of fact (whether oral or in writing) to the Purchaser which is untrue or inaccurate or which was intended by the Supplier to mislead the Purchaser;

3A.1.6 except as disclosed on or before the Commencement Date, no legal proceedings are pending or, to the Supplier's knowledge, threatened against it which if decided against the Supplier would have a material adverse effect upon the Supplier's financial condition or business or its ability to perform its obligations under this Agreement and any related ancillary documents; and

3A.1.7 no Insolvency Event has occurred or is reasonably likely to occur in relation to the Supplier.

3A.2 The Supplier acknowledges and agrees that the Purchaser is relying on the representations and warranties above and is entering into this Agreement on the basis of them.

4. **SUPPLIER'S GENERAL OBLIGATIONS**

4.1 **General Undertaking and Warranties**

The Supplier undertakes and warrants to the Purchaser, for the benefit of the Purchaser that it shall design, manufacture, supply, test, commission and deliver the Goods:

- 4.1.1 so that the Goods are Fit for Purpose;
- 4.1.2 so that the Goods satisfy the Product Acceptance Criteria and the Fleet Acceptance Criteria;
- 4.1.3 so that the Goods are manufactured in accordance with the design agreed in accordance with this Agreement;
- 4.1.4 in accordance with, and so that the Goods shall function in accordance with, sound modern design and engineering principles and practices in the rail industry except where these would conflict with Clauses 4.1.1 and 4.1.2;
- 4.1.5 in accordance with the Specification and the Contract Programme so as to achieve Product Acceptance and/or Fleet Acceptance of the Goods on their respective Contractual Dates;
- 4.1.6 in compliance with all Applicable Laws and all applicable LU Standards;
- 4.1.7 in accordance with good industry practice and with all due skill, care and diligence 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;
- 4.1.8 using materials and goods that comply with the Specification and all Applicable Laws and LU Standards and so that the Goods will be of new manufacture and comply with the Specification;
- 4.1.9 in accordance with the requirements of any instructed Variation and in all other respects in accordance with this Agreement; and
- 4.1.10 in respect of the Spares, so that each of those is sufficient and adequate to enable maintenance to be carried out on the Goods.

4.2 Third Party Warranties

The Supplier shall extend to the Purchaser the benefit of any guarantee, condition or warranty which may have been expressly given to it by any of the Subcontractors in respect of the Goods, and shall use its best endeavours to extend to the Purchaser the benefit of any guarantee, condition or warranty which may have been expressly given to it by any other person in respect of such Goods.

4.3 Compliance

In performing its obligations under this Agreement, the Supplier shall, and shall procure that its Subcontractors shall:

- (a) comply with the version of the Contract Programme in place from time to time; and
- (b) comply with all Applicable Laws, all applicable LU Standards and all directions of the Purchaser and any other Competent Authority.

4.4 Licences and Consents

The Supplier shall obtain and maintain all consents, approvals, authorisations, acceptances, certificates, licences (including export licences), exemptions, registrations, filings, permits and other matters, give all notices and pay all fees, in each case which are required or necessary for the proper performance of the Supplier's duties and obligations under this Agreement ("**Relevant Consents**").

4.5 **Tax Allowances**

The Supplier undertakes and confirms to the Purchaser that neither it nor any other person which is a member of the Supplier Group, a Subcontractor, a supplier or a provider of finance to the Supplier 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 the Goods

4.6 **Key Dates**

The Supplier shall perform its duties and obligations under this Agreement so that each Key Date is met.

5. **CHANGE IN LAW**

5.1 The Parties have agreed to allocate the risks associated with any Change in Law as set out in this Clause 5.

5.2 On becoming aware of the occurrence of any Change in Law, the Purchaser shall notify the Supplier in writing with an instruction to address and comply with such Change in Law and the Supplier shall forthwith comply with that Change in Law as specified in the instruction. The Purchaser's instruction under this Clause 5.2 shall constitute a Variation and the consequences of implementing such Change in Law shall be dealt with in accordance with Clause 23.

5.3 The Supplier shall, without prejudice to its general obligation to comply with the terms of this Agreement:

5.3.1 use its reasonable endeavours to mitigate the adverse effects of any Change in Law and take all reasonable steps to minimise any increase in costs arising from such Change in Law; and

5.3.2 use its reasonable endeavours to take advantage of any positive or beneficial effects of the Change in Law and take all reasonable steps to maximise any reduction in costs arising from such Change in Law.

5.4 The Purchaser and the Supplier shall adjust the Contract Price by the amount calculated in accordance with the Variation Procedure. The Supplier shall not be entitled to any other payment or compensation or, save as expressly provided otherwise in this Agreement, relief in respect of such Change in Law or associated Variation (or the consequence of either) and the provisions of this Agreement shall be construed accordingly.

5.5 The Parties agree that the Supplier shall not be entitled to propose a Variation for any Foreseeable Change in Law and the Supplier shall be required to comply with and implement such Foreseeable Change in Law at its own risk, cost and expense and with no entitlement to additional remuneration, adjustment to the Contract Price and/or any Key Date or Contractual Date.

5.6 The Supplier shall take all steps necessary to ensure that it performs all of its obligations under this Agreement in accordance with the terms of this Agreement following any Change in Law.

6. SPECIFICATION AND DEVELOPMENT OF DESIGN

6.1 Specification

The Supplier acknowledges and agrees that it has reviewed and considered the Specification and is satisfied:

6.1.1 as to its feasibility with respect to the design, manufacture, supply, testing, commissioning and delivery of the Goods; and

6.1.2 that it will be able to implement them within the timescales set out in the Contract Programme.

6.2 Design Procedures

6.2.1 The Supplier shall undertake the design of the Goods in accordance with the requirements of this Agreement and the Specification.

6.2.2 The Supplier shall cooperate with the Saloon Designer to enable the Installation Instructions to be provided. The method of communication of such cooperation shall be as set out in Schedule 1A (*Specification*).

6.2.3 The Purchaser shall make available to the Supplier such Trains as required to enable the Supplier to survey for its Design.

6.3 Design Acceptance Process

6.3.1 The Supplier shall provide the required Design review submission documents to the Purchaser in accordance with the Design acceptance process detailed in Schedule 1A (*Specification*).

6.3.2 Following submission of such Design review submission documents, the Purchaser shall respond to the submissions in the Design review meetings as envisaged in Schedule 1A (*Specification*).

6.3.3 Where a Design review submission document(s) does not provide evidence of compliance with this Agreement and Schedule 1A (*Specification*), the Purchaser shall in consultation with the Supplier, prepare an outstanding issues list whereby actions, action holders and close out dates shall be assigned and agreed (the "OIL").

6.3.4 Following agreement of the OIL to the satisfaction of the Purchaser, or if there are no outstanding issues, the Purchaser shall have the sole discretion as to whether to move the Supplier to the next Design review stage.

6.3.5 Clauses 6.3.1 to 6.3.4 inclusive shall apply to each stage in the Design review process.

6.3.6 Following the completion of the Prototype Design Review to the satisfaction of the Purchaser, the Supplier shall have achieved Prototype Design Review Approval.

6.3.7 The Supplier shall not commence the manufacture of the Prototype Goods until it has achieved Prototype Design Review Approval in accordance with Clause 6.3.6 and the Purchaser has given the instruction to proceed with production of the Prototype Goods..

- 6.3.8 Following the completion of the Production Readiness Review to the satisfaction of the Purchaser, the Supplier shall have achieved Design Approval.
- 6.3.9 The Supplier shall not commence the manufacture of the Goods until it has achieved Design Approval in accordance with Clause 6.3.8 and the Purchaser has given the instruction to proceed with production of the Goods.
- 6.3.10 Without prejudice to any other rights or remedies of the Purchaser at law or under this Agreement, where failure by the Supplier to comply with Clause 6.3.7 causes or contributes to Late Design Approval, the Purchaser shall have the right to claim liquidated damages pursuant to Clause 13.2.

6.4 **Design Liability**

All design liability in relation to the Goods shall be borne solely by the Supplier.

6.5 **Liability for Performance**

Notwithstanding any other provision of this Agreement, no examination or lack of examination and/or assurance given by the Purchaser in respect of any document submitted by the Supplier shall in any way relieve or absolve the Supplier from any obligation or liability under or in connection with this Agreement whether in relation to accuracy, safety, suitability, adequacy, performance, time or otherwise.

6.6 **Prototype Trains**

- 6.6.1 The Supplier shall manufacture the Prototype Goods in accordance with the Prototype Design Review Approval.
- 6.6.2 The Supplier shall supply the Prototype Goods by the corresponding Key Date.
- 6.6.3 The Prototype Goods will be installed into the Prototype Trains by the Installer in accordance with the Installation Instructions.
- 6.6.4 The Supplier shall carry out the tests on the Prototype Goods once installed in the Prototype Trains.
- 6.6.5 The Supplier shall remain on the Premises of the Installer for the period of the installation and testing of the Prototype Goods on the Prototype Trains.
- 6.6.6 The Supplier shall note the testing methodology and results and provide copies of the same to the Purchaser.
- 6.6.7 The Purchaser may, at its option at any time after Production Readiness Review Approval, instruct the Supplier to commence the manufacture of the Goods. Such manufacture shall be in accordance with the Contractual Dates and the Contract Price.
- 6.6.8 Any repetition or prolongation of the testing of the Prototype Goods on the Prototype Trains which is necessary by reason of a failure of any of the Prototype Goods to meet the requirements of the Production Readiness Review shall be at the Supplier's cost. The Supplier shall not be entitled to any additional costs, any extension of time or any other relief in connection with such failure.

6.7 **Design Authority**

- 6.7.1 The Supplier shall act as the Design Authority for the duration of this Agreement.
- 6.7.2 The Supplier shall comply with the following obligations in its role as Design Authority:
 - (a) operate and maintain a system that tracks changes to the original Design of the Goods;

- (b) operate a system that can provide the "know-why" (factors which influenced the choice of the Design) in relation to Design information relating to the Goods;
- (c) operate a system that facilitates validation of technical changes to the current Design of the Goods;
- (d) maintain a comprehensive understanding of the technical and operational requirements of the Goods;
- (e) maintain comprehensive knowledge of how the technical and operational requirements influence the Design of the Goods and retain records accordingly;
- (f) retain information relating to the Design to enable performance and assessment of modifications, evaluation of change of use, understanding of vehicle system and component behaviour, and support incident investigation as reasonably required by the Purchaser;
- (g) make informed judgements and validate operational safety implications relating to change of use and modifications including where the same is required by the Purchaser; and
- (h) ensure that records are kept of the configuration levels of Design throughout the duration of this Agreement to ensure the above is carried out accurately and safely and that any modifications are compatible with the original Design and any subsequent modifications.

6.7.3 The Parties agree that any failure to comply with this Clause 6.7 will constitute a material breach for the purposes of Clause 25.1.

7. **CONFLICTS AND DISCREPANCIES**

7.1 **Priority of provisions in the Agreement**

Unless expressly stated otherwise, where there is any conflict, error, inconsistency or other discrepancy between any Clause of this Agreement and the provisions of any Schedule(s) or between the provisions of any Schedules to this Agreement, the order of priority shall be as follows:

- 7.1.1 first, the Contract Particulars (as set out in Schedule 16 (*Contract Particulars*));
- 7.1.2 second, the Clauses comprising the main body of this Agreement;
- 7.1.3 third, the Specification (excluding the LU Standards);
- 7.1.4 fourth, the LU Standards; and
- 7.1.5 fifth, the remaining Schedules to this Agreement.

7.2 **Supplier's acknowledgements regarding discrepancies and errors**

The Supplier confirms to the Purchaser that as at the Commencement Date:

- 7.2.1 it has considered in detail this Agreement and has satisfied itself that no conflicts, inconsistencies, discrepancies or errors exist within the Agreement; and
- 7.2.2 it has:

- (a) obtained all necessary information as to the risks, contingencies and all other circumstances which may influence or affect the level of payment arising under or in connection with this Agreement; and
- (b) satisfied itself that the performance of its obligations under and in accordance with this Agreement will be in accordance with all Applicable Laws; and

7.2.3 it has satisfied itself as to the feasibility of the Specification with respect to the design, manufacture, supply, assembly, testing, commissioning and delivery of the Goods.

7.3 Notification of errors and inconsistencies

7.3.1 Without prejudice to Clause 7.3.3, the Supplier shall notify the Purchaser in writing forthwith upon becoming aware of any conflict, inconsistency, discrepancy or error within the Agreement that cannot be resolved in accordance with Clause 7.1 and the Supplier shall provide with such notice detailed written proposals for resolving such conflict, inconsistency, discrepancy or error. The Purchaser shall decide how such conflict, inconsistency, discrepancy or error should be dealt with and shall notify the Supplier of such decision within fifteen (15) Working Days of the Supplier's notice of such conflict, inconsistency, discrepancy or error. The Supplier shall immediately proceed to comply with such decision. The Purchaser's notification under this Clause 7.3.1 shall constitute a Variation provided that the Supplier shall not be entitled to any increase in the Contract Price or any other payment, compensation, extension of time or relief in respect of such Variation instructed in accordance with this Clause 7.3.1.

7.3.2 Without prejudice to Clause 7.3.1 and subject to Clause 7.3.3, whenever a conflict, inconsistency, discrepancy or error appears within this Agreement, the Parties shall consult with each other over, and seek to agree, the manner in which the conflict, error, inconsistency or discrepancy should be resolved.

7.3.3 Where any conflict, inconsistency, discrepancy or error appears within the LU Standards, or between a LU Standard and the equivalent Industry Standard, each Party shall notify the other forthwith in writing upon becoming aware of such conflict, inconsistency, discrepancy or error. The Purchaser shall decide how such conflict, inconsistency, discrepancy or error should be dealt with and shall notify the Supplier within fifteen (15) Working Days of receiving or issuing the notice (as the case may be). The Supplier shall comply with such decision in carrying out the manufacture of the Goods. The Purchaser's notification under this Clause 7.3.3 shall constitute a Variation and the provisions of Clause 23 shall apply.

7.4 Exclusions of Claims or Relief

The Supplier acknowledges and agrees that it accepts all risks arising from any conflicts, errors, inconsistencies or discrepancies 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 any additional payment or compensation, adjustment to the Contract Price, extension of time or relief from the due performance of its obligations, in respect of any such conflicts, errors, inconsistencies or discrepancies.

8. **CONTRACT PROGRAMME**

8.1 **Contract Programme**

8.1.1 The Supplier shall provide a programme to the Purchaser for his acceptance (such acceptance to be achieved on or prior to the date stated in the Contract Particulars) showing:

- (a) the Commencement Date, Key Dates, Contractual Dates and payment dates;
- (b) the sequence and timing of activities by which the Supplier proposes to carry out the Agreement (including design, manufacture, testing, commissioning and delivery);
- (c) the respective dates for submission by the Supplier of the Design, Manuals and the Installation Instructions for approval thereof by the Purchaser;
- (d) the dates by which, in order to carry out the Agreement, the Supplier will need (to the extent provided for under this Agreement):
 - (i) access to the Purchaser's Premises or Trains;
 - (ii) acceptances or approvals from the Purchaser and/or Purchaser;
 - (iii) any plant, materials, drawings, information or other things to be provided by the Purchaser, the Saloon Designer or other System Suppliers;
- (e) the dates when the Supplier plans to conduct the Tests or inspections; and
- (f) any other information which the Specification require the Supplier to show on the Contract Programme.

8.1.2 The Supplier undertakes to carry out the design, manufacture, supply, testing, commissioning and delivery of the Goods in a regular and diligent manner and in accordance with the Contract Programme.

8.1.3 The matters set out in the Contract Programme shall be wholly without prejudice to the Supplier's obligation to achieve Product Acceptance and (as appropriate) Fleet Acceptance for the Goods on their respective Contractual Dates.

8.2 **Form of programme**

8.2.1 The programme shall be in such form as may be specified in the Contract Particulars or, if not so specified, as may reasonably be required by the Purchaser.

8.3 **Acceptance of programme**

8.3.1 The Purchaser shall either accept a programme (or any revised programme submitted pursuant to Clauses 8.5 or 8.6) or notify the Supplier of his reasons for not accepting it. Reasons for not accepting the programme may include:

- (a) the Supplier's plans shown on it are not practicable;
- (b) it does not show the information which this Agreement requires;
- (c) it does not represent the Supplier's plans realistically; or
- (d) it does not comply with the Contract Particulars or Specification.

8.3.2 Acceptance by the Purchaser of the programme shall not relieve the Supplier of any of his obligations under this Agreement.

8.4 **Alterations to programme**

8.4.1 The Supplier shall not without the Purchaser's prior written consent make any alteration to the Contract Programme.

8.5 **Revision of programme**

8.5.1 The Supplier shall submit a revised programme to the Purchaser, such programme to be acceptable to the Purchaser:

- (a) every two weeks from the Commencement Date pursuant to Schedule 1B (*Contract Management*); and
- (b) if instructed to do so pursuant to Clause 8.6.

8.6 **Rate of progress**

8.6.1 The Purchaser may notify the Supplier if it assesses that any of the Goods will not be capable of any of their respective Key Dates and/or Contractual Dates and that this is not due to a circumstance for which the Supplier is entitled to an extension of time pursuant to Clause 15.

8.6.2 Following receipt of such notice the Supplier shall take such steps as may be necessary and as the Purchaser may approve to remedy or mitigate the likely delay, including submitting a revised programme to the Purchaser for acceptance. The Supplier will not be entitled to additional payment or an extension of time for taking such steps.

9. **KEY PERSONNEL, MEETINGS AND REPORTS**

9.1 **Key Personnel**

The Supplier shall not replace any Key Personnel without:

- 9.1.1 giving not less than sixty (60) days' notice; and
- 9.1.2 proposing a replacement Key Personnel to the Purchaser who the Purchaser has approved (such approval not to be unreasonably withheld or delayed).

9.2 **Management of Delivery**

The Parties shall comply with Schedule 1B (*Contract Management*) in relation to design management, project management and programme management.

10. **MANUFACTURING FACILITIES AND RIGHTS OF AUDIT AND INSPECTION**

10.1 **Manufacturing facilities**

The Supplier shall ensure that the design, manufacture, assembly and Routine Production Testing of the Goods shall be carried out by the Supplier at the Supplier's Works and the Supplier shall not use any other manufacturing facility for such manufacture, assembly and testing without the prior written agreement of the Purchaser.

10.2 Access to Facilities for Purpose of Audits

For the purposes of exercising any of their rights under Clause 10, the Supplier shall (a) grant the Purchaser access on reasonable prior notice to any of the Supplier's premises involved in the design, manufacture, supply, testing, commissioning and delivery of the Goods including the Supplier's Works and (b) use its reasonable endeavours to procure such access to those premises of its agents and Subcontractors.

10.3 Right of Audit and Inspection

10.3.1 The Supplier shall, and shall (unless the Purchaser otherwise agrees in writing) procure that its Subcontractors shall:

- (a) maintain a complete and correct set of records pertaining to all activities relating to the performance of the Supplier's obligations under this Agreement and all transactions and Subcontracts entered into by the Supplier for the purposes of performing its obligations under this Agreement (in respect of the Supplier) and the performance by the Subcontractor of its obligations under its Subcontract (in respect of the Subcontractor) (the "**Supplier's Records**"); and
- (b) retain all the Supplier's Records until the date six (6) years (or such longer period as may be required by law or specified in the Contract Particulars) following expiry or termination of this Agreement for whatever reason (the "**Retention Period**").

10.3.2 Notwithstanding any other right of audit that the Purchaser is entitled to under this Agreement, in order to verify the Supplier's performance of and compliance with the Agreement the Purchaser shall be entitled on reasonable notice (whether in writing or verbally), either itself or using agents or representatives:

- (a) audit, inspect or witness any aspects of the manufacturing testing or commissioning of the Goods or any other item of Goods or any of their Parts and to audit the design and certification thereof including being present at, and participating in, amongst other things:
 - (i) any inspection and conformance control of subsystems supplied by Subcontractors;
 - (ii) any inspection and conformance control of the Goods construction at stages to be agreed between the Purchaser and the Supplier;
 - (iii) any system tests (at stages to be agreed) during construction;
 - (iv) any dynamic run testing of the completed Goods; and
 - (v) any inspection and certification of the Goods' compliance with the Specification after completion of manufacture and dynamic testing;

- (b) inspect any and all of the Supplier's Records during the Retention Period as are reasonably necessary to investigate the Supplier's (and any Subcontractor's) performance of its obligations under this Agreement;
- (c) audit the management systems of the Supplier and those of any Subcontractor; and
- (d) inspect and/or audit compliance by the Supplier and its Subcontractors with the Supplier's obligations under this Agreement.

10.4 **Co-operation with Audit Procedure**

To the extent necessary for the purpose of exercising any of the rights granted under Clause 10.3.2 the Supplier shall provide, and shall procure that its Subcontractors shall provide, all reasonable co-operation to the Purchaser including:

- 10.4.1 upon request from the Purchaser, acting reasonably, providing electronic or paper copies of any Supplier's Records required for the purposes of Clause 10.3.2(b) free of charge and within a reasonable time of any request; and
- 10.4.2 making the Supplier's employees available for discussion with the Purchaser.

10.5 **No Claim for Relief**

No audit, inspection and/or testing by the Purchaser pursuant to Clause 10.3.2 shall relieve the Supplier (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 Supplier.

10.6 **Corrective Actions Arising**

- 10.6.1 Any actions found to be reasonably necessary having regard to the Supplier's obligations under this Agreement as a consequence of the Purchaser undertaking any inspections or audits (a "**Corrective Action**") shall be carried out by the Supplier. The Supplier shall acknowledge formally within two (2) Working Days receipt of any request for a Corrective Action raised by the Purchaser, together with the Supplier's confirmation of the timescale allocated by the Purchaser for the Supplier to close out the Corrective Action. The Supplier shall advise the Purchaser 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 10.2 to 10.5.
- 10.6.2 If the Supplier (acting reasonably) disputes any Corrective Action, it shall notify the Purchaser whereupon the Supplier 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 Supplier may refer the dispute for determination in accordance with Clause 32.

10.7 **Plans for Remedial Action**

If, at any time in the course of any participation or inspection by the Purchaser in accordance with Clauses 10.3 and 10.6, the Purchaser reasonably determines that any item of Goods does not, or is unlikely in the future to comply with any of the Specification or the requirements of Clause 4.1, the Purchaser shall notify the Supplier of such determination. The Purchaser and the Supplier shall thereafter use all reasonable

endeavours to agree a plan for necessary remedial action to be implemented by the Supplier, at the Supplier's cost, to ensure that that the item of Goods does or will conform to the Specification and the requirements of Clause 4.1.

11. SPARES AND CONTINUING SUPPORT

11.1 Quality and Identifiability

The Supplier shall ensure that:

- (A) each of the Spares is a brand new part manufactured from materials of sound and satisfactory quality, is Fit for Purpose and has no Defects;
- (B) to the extent of good industry practice, each Spare has a serial number which is clearly identifiable when fitted to the Train; and
- (C) each Spare is clearly labelled or otherwise identifiable as being the property of the Purchaser.

11.2 Time for Delivery

11.2.1 Without prejudice to Clause 4.1, the Supplier shall deliver all Spares to the relevant Delivery Location in accordance with the requirements of Schedule 3 (*Spares*) and on the dates and in the quantities specified below as appropriate:

- (a) 25% of all Maintenance Spares, and any Additional Spares requested prior to such time, shall be delivered by no later than installation of Goods on the first Train;
- (b) a further 25% of all Maintenance Spares and any Additional Spares requested prior to such time (but after the date identified in sub-clause (a) above), shall be delivered by no later than Product Acceptance of Train 40;
- (c) a further 25% of all Maintenance Spares and any Additional Spares requested prior to such time (but after the date identified in sub-clause (b) above), shall be delivered by no later than Product Acceptance of Train 60; and
- (d) the final 25% of all Maintenance Spares and any Additional Spares requested prior to such time (but after the date identified in sub-clause (c) above), shall be delivered no later than Product Acceptance of Train 80.

11.2.2 The Supplier shall deliver the minimum quantity of each type of Maintenance Spare as specified in Schedule 3 (*Spares*) Part A (*Maintenance Spares*) (unless the Parties otherwise agree, acting reasonably).

11.3 Sufficiency of Maintenance Spares

The Supplier warrants to the Purchaser at the date of this Agreement that the Maintenance Spares to be delivered to the Purchaser pursuant to Clause 11.2 are sufficient (in terms of both quality and quantity) to enable the Purchaser to carry out, or procure the carrying out of, all maintenance of the Goods during the period from Acceptance for Service of the Goods for the first Train to Fleet Acceptance and for the Purchaser to operate the Goods on the LUL Network in accordance with the Manuals. If this warranty proves to have been incorrect when made, the Supplier shall at its own cost procure and supply the necessary additional Maintenance Spares.

11.3A Supplementary Spares

11.3A.1 The Supplier shall, following the issue of the Product Acceptance Certificate for the first Train, be responsible for acquiring at its own cost new or overhauled Spares (the "**Supplementary Spares**") to replace any Maintenance Spare which is installed by the Installer (or such other party as may be nominated by the Purchaser) on a Train to remedy a Defect, in order to maintain the stock of Maintenance Spares in accordance with the levels specified in Schedule 3 (*Spares*) Part A (*Maintenance Spares*).

11.3A.2 The Supplier shall ensure any Supplementary Spares are placed into the Delivery Location within fourteen (14) days of notification by the Purchaser that installation of a Spare in accordance with Clause 11.3A has occurred.

11.3A.3 Not Used.

11.3A.4 Title and risk in each Supplementary Spare shall, from the earlier of the date of (i) their delivery to the Delivery Location or (ii) their incorporation in the relevant Train, pass to the Purchaser with full unencumbered legal and beneficial title.

11.4 **Additional Spares**

11.4.1 The Purchaser may from time to time instruct the Supplier in writing to provide Additional Spares by instructing a Variation setting out reasonable details of its requirements, and the provisions of Clause 23 shall apply.

11.4.2 The Supplier shall use all reasonable endeavours to make Additional Spares available to the Purchaser by delivering them to the Purchaser within the time period specified in the Variation.

11.5 **Obsolescence of Spares**

11.5.1 The Supplier shall ensure that, at any time where it intends to or becomes aware that any of its suppliers and/or Subcontractors intends to:

- (a) dispose of any item of Spares due to such Spare becoming obsolete or being replaced by a comparable spare; and/or
- (b) stop the production or sale of any item of Spares,

the Supplier shall notify the Purchaser prior to any such disposal or cessation of production and sale, and the Purchaser may in such circumstances require the Supplier to:

- (i) produce one or more of such Spares for the Purchaser; and/or
- (ii) sell any remaining Spares or Spares produced in accordance with Clause 11.5.1(i) to the Purchaser at the rates set out in Schedule 3 (*Spares*) or such other amounts as agreed in accordance with this Agreement.

11.6 **Ongoing Spares**

The Purchaser may, at its option at any time during the term of this Agreement, procure pursuant to a separate support and spares supply agreement, the supply of Spares and other support services from the Supplier.

11.7 **Continuing Support**

The Parties shall comply with Schedule 3A (*Continuing Support*) in relation to continuing support.

12. TESTING, ACCEPTANCE AND DELIVERY PROCEDURE

12.1 Compliance with the Programmes and Procedures

The Supplier shall ensure that:

12.1.1 the Goods are delivered, tested and made ready for installation, Installation Tests, Product Acceptance, and Fleet Acceptance by the Purchaser in accordance with the Specification, the Contract Programme, and the other provisions of this Agreement; and

12.1.2 no Goods are delivered to the relevant Delivery Location prior to its Key Date or Contractual Date respectively unless otherwise agreed by the Purchaser in its absolute discretion. For the avoidance of doubt the Purchaser is not obliged to accept early delivery of any Goods.

12.2 Routine Production Testing

12.2.1 The Supplier shall develop and submit to the Purchaser the Routine Production Test Specification in accordance with Schedule 1A (*Specification*).

12.2.2 Following approval of the Routine Production Test Specification in accordance with Schedule 1A (*Specification*), the Supplier shall conduct the Routine Production Tests at its own cost in accordance with the production plan.

12.2.3 The Purchaser shall be entitled to attend any Routine Production Tests together with such other representatives of the Purchaser and the Supplier shall be responsible for providing such access. The Supplier shall provide the Purchaser with not less than fifteen (15) Working Days' notice of the time, location and subject matter of any such Routine Production Tests.

12.2.4 The Supplier shall be responsible for all costs and expenses associated with the Routine Production Tests.

12.2.5 Any repetition or prolongation of the Routine Production Tests which is necessary by reason of a failure of any of the Goods to meet the requirements of the Routine Production Tests shall be at the Supplier's cost. The Supplier shall not be entitled to any additional costs, any extension of time or any other relief in connection with such failure.

12.2A Storage

12.2A.1 The Purchaser may notify the Supplier that:

(A) it does not want the CCTV System for a Train or quantities of Spares set out in Clause 11.2.1 to be delivered to the Delivery Location on the relevant Key Date for such CCTV System or Spares; and

(B) it requires the Supplier to continue to store and maintain such CCTV System and Spares in Storage in accordance with the storage instructions in Schedule 1A (*Specification*) and in a manner that would enable the CCTV System or Spares to be delivered to the Delivery Location on a revised Key Date specified by the Supplier and achieve Acceptance for

Service at the relevant revised Contractual Date for Acceptance for Service. (“**Storage Option**”)

12.2A.2 If the Purchaser exercises the Storage Option pursuant to Clause 12.2A.1 then any increase in the Contract Price to pay for the Storage Option as envisaged by this Clause 12.2A shall be calculated in accordance with Schedule 4 (*Contract Price*).

12.2A.3 If the revised Key Date pursuant to the Storage Option is delayed for:

- (A) more than six (6) months from the original Key Date for delivery for the CCTV System and any Spares to the Delivery Location, then there will be a partial Milestone Payment payable for storing such CCTV System and Spares in Storage, being 30 percent of the Milestone Payment specified for completion of the Pre-Installation Inspection and Systems Tests in Schedule 4 (*Contract Price*) Part 4 (Milestone Payments); and
- (B) more than twelve (12) months from the original Key Date for delivery of the CCTV System and any Spares to the Delivery Location, then there will be a further partial Milestone Payment payable for maintaining such CCTV System and Spares in Storage, being 30 percent of the Milestone Payment specified for the completion of the Pre-Installation Inspection and Systems Tests in Schedule 4 (*Contract Price*) Part 4 (Payment Milestones), and the Supplier shall be entitled to a Variation.

12.3 **Delivery**

12.3.1 In relation to the Goods, the Supplier shall (at its own cost) deliver the Goods to the Delivery Location, together with such evidence as the Purchaser may reasonably require that the Goods have passed the Routine Production Tests, for such Goods, .

12.3.2 The Supplier’s ability to deliver Goods for a Train on the relevant Key Date or achieve the Routine Production Tests for such Goods will be monitored and assess against the KPIs as set out in Schedule 12 (*Key Performance Indicators*).

12.4 **Installation Tests**

12.4.1 Following delivery of the Goods:

- (a) the Purchaser shall procure that the Installer installs the Goods on to the relevant Train in accordance with the Installation Instructions; and
- (b) the Purchaser shall procure that that the Installer conducts the Installation Tests in accordance with the Specification.

12.4.2 The Supplier undertakes, at its own cost, to provide to the Purchaser (or, at the Purchaser's direction, its nominee):

- (a) the Training Programme and Training Materials; and
- (b) On-Site technical and quality support as more particularly described in Schedule 3A (*Continuing Support*),

to enable the Purchaser to procure the installation of the Goods and to conduct the Installation Tests on the Trains in accordance with the Contract Programme.

12.4.3 In the event that any Goods installed on a Train do not pass any Installation Test, the Supplier shall be responsible at its own cost for:

- (a) carrying out the works required to ensure that the failed Installation Test(s) can be passed (the "**Rectification Works**");
- (b) (if required by the Purchaser) removing the relevant Goods from the Delivery Location;
- (c) re-delivering the relevant Goods to the Delivery Location once the Rectification Works are complete on a date to be arranged with the Purchaser; and
- (d) the repetition and/or prolongation of the Installation Test(s) necessary by reason of the failure of any of the Goods to meet the requirements of the Installation Test(s);

and, for the avoidance of doubt, the Supplier shall not be entitled to any additional costs, any extension of time or any other relief in connection with such failure, provided that the costs of undertaking any Rectification Works and/or repeated/prolonged Installation Test(s) shall be met by the Purchaser if the Supplier can demonstrate that the failure of such Goods to meet the requirements of the Installation Test(s) arose wholly and solely due to a failure by the Purchaser to install the Goods in accordance with the Installation Instructions

12.4.4 A Train shall obtain Acceptance for Service when all of the Installation Tests have successfully been completed.

12.5 Product Acceptance

12.5.1 The Product Acceptance Criteria shall be:

- (a) in relation to all Goods:
 - (i) the Purchaser has received evidence acceptable to the Purchaser, including all relevant supporting documentation, that the Goods have passed all Routine Production Tests and Installation Tests required to be performed prior to Product Acceptance of the relevant Goods (including, without limitation, any re-testing as required as a result of the installation of the Goods);
 - (ii) in the case of the sixtieth Train's worth of Goods and the eightieth Train's worth of Goods (as the case may be), the Supplier has supplied the applicable quantity of Spares in accordance with Clause 11.2.1(b) and Clause 11.2.1(c) of this Agreement;
 - (iii) the Goods meet in all material respects the Specification;
 - (iv) the Goods are Fit for Purpose and have no Defects, or items missing;
 - (v) the Goods comply with Applicable Laws and LU Standards;
 - (vi) the Goods have achieved all Relevant Consents; and
 - (vii) the Train in which the Goods have been installed has successfully completed 1,000 consecutive Fault Free kilometres in passenger service, provided that in all cases the Parties agree that each time a Defect occurs, the Fault Free running distance

shall be reset to zero and recommence until the target is achieved.

If the Supplier meets the Product Acceptance Criteria, it shall be entitled to request the certification of Product Acceptance in accordance with Clause 12.5.2.

- 12.5.2 Where the Product Acceptance Criteria are satisfied in respect of the Goods for a Train, the Supplier shall be entitled to submit to the Purchaser a Product Acceptance Certificate for such Train signed by a duly authorised representative of the Supplier certifying that the Product Acceptance Criteria have been satisfied. Following receipt of a Product Acceptance Certificate from the Supplier in accordance with this Clause 12.5.2, the Purchaser shall within the period stated in the Contract Particulars (i) counter-sign and date that Product Acceptance Certificate and Product Acceptance shall occur, or (ii) refuse to do so under Clause 12.5.3.
- 12.5.3 The Purchaser may refuse to sign a Product Acceptance Certificate for the Goods for a Train if it, acting reasonably, believes the Product Acceptance Criteria have not been satisfied in full in which case it shall, within five (5) Working Days of such refusal, notify the Supplier in writing setting out which of the Product Acceptance Criteria have not been satisfied.
- 12.5.4 If the Supplier, acting reasonably, disputes any of the reasons set out in the notice issued by the Purchaser pursuant to Clause 12.5.3, it shall notify the Purchaser of this in writing within five (5) Working Days of receipt of such notice and the Parties shall resolve the matter in accordance with the Dispute Resolution Procedure.

12.6 **Qualified Product Acceptance**

- 12.6.1 If the Purchaser, acting reasonably, believes that one or more of the Product Acceptance Criteria (as the case may be), other than those set out in Clauses 12.5.1(a)(i) and 12.5.1(a)(v), has not been satisfied, and provided that any Goods can nevertheless be operated safely and in accordance with all Applicable Laws and the terms of all Relevant Consents, the Purchaser shall be entitled, at its absolute discretion, to issue a QPAC in respect of Goods, in which case the Purchaser shall list in detail in the QPAC the outstanding conditions to be satisfied and tasks to be performed by the Supplier in order for Product Acceptance of the Goods to occur (the "**Preconditions**"), and require the Supplier to satisfy the Preconditions in accordance with the timetable set out in the relevant QPAC, which timetable shall state that all Preconditions must be completed on or before the date on which of the Goods is scheduled to occur pursuant to the Contract Programme.
- 12.6.2 Upon the Purchaser confirming in writing that such Preconditions have been satisfied, the Goods shall be Product Accepted and the Purchaser shall issue a Product Acceptance Certificate in respect of the Goods.
- 12.6.3 Fleet Acceptance of the Goods shall not occur until all the Preconditions have been satisfied for all of the Trains.
- 12.6.4 In relation to the Milestone Payments, the Goods for which a QPAC is issued shall be treated as if they have been Product Accepted pursuant to Clause 12.6.

12.7 Fleet Acceptance

- 12.7.1 The Purchaser shall, using all reasonable endeavours, procure that the Installer will facilitate the Supplier to achieve Fleet Acceptance of the Goods by the relevant Contractual Date.
- 12.7.2 The Supplier shall make a submission for Fleet Acceptance to the Purchaser once the Fleet Acceptance Criteria have been satisfied. The Fleet Acceptance Criteria are:
- (a) Up to the date upon which the Supplier makes a submission for Fleet Acceptance, all the Goods have met the Fleet Mean Distance Between Service Affecting Failure within the Service Affecting Failure Period;
 - (b) Not Used;
 - (c) the Preconditions set out in any QPAC under Clause 12.6.1 have been satisfied to the satisfaction of the Purchaser in respect of the relevant Goods;
 - (d) each of the Goods has no Defects;
 - (e) there are no Recurrent Defects or, in the event there is a Recurrent Defect, the Supplier has either:
 - (i) provided to the Purchaser's satisfaction a programme for rectification works in respect of such Recurrent Defects in accordance with Clause 17.5; or
 - (ii) confirmed to the Purchaser's satisfaction that a Recurrent Defect occurring in or affecting any Goods, Spares or Parts provided by the Supplier which is similar to the Goods to be supplied pursuant to this Agreement will not affect the Goods supplied pursuant to this Agreement;
 - (f) each of the Goods has been Product Accepted.
- 12.7.3 Upon the Fleet Acceptance Criteria having been satisfied in accordance with Clause 12.7.2 the Supplier shall be entitled to submit a Fleet Acceptance Certificate for the Goods signed by a duly authorised representative of the Supplier to the Purchaser, and the Purchaser shall counter-sign and date that Fleet Acceptance Certificate and Fleet Acceptance shall occur. Subject to Clause 12.7.4 and for the avoidance of doubt, the Milestone Payment for Fleet Acceptance shall not become payable until (i) the requirements of this Clause 12.7.3 have been satisfied in full in respect of the Goods and (ii) the Fleet Acceptance Certificate has been counter-signed and dated by the Purchaser.
- 12.7.4 If, the Supplier fails to meet its obligations under Clause 12.7.2(a), the Purchaser shall be entitled to extend the Service Affecting Failure Period until the Fleet Acceptance Longstop Date. If the Goods have failed to meet the Fleet Mean Distance Between Service Affecting Failure by the Fleet Acceptance Longstop Date then the Purchaser shall be entitled at its absolute discretion to issue a Fleet Acceptance Certificate irrespective of such failure and in such circumstances Fleet Acceptance shall occur, provided that the Purchaser may, in its absolute discretion, reduce or withdraw the Milestone Payment for Fleet Acceptance; and

the occurrence of Fleet Acceptance shall not constitute a waiver of the Purchaser's right to claim damages against the Supplier arising out of the Supplier's failure to meet the Fleet Mean Distance Between Service Affecting Failure.

13. **PERFORMANCE MANAGEMENT**

13.1 **Key Performance Indicators**

Key Performance Indicators will be used to monitor performance of the Supplier in relation to its compliance with the delivery dates of the Goods and Spares in accordance with Schedule 12.

13.2 **Liquidated Damages**

13.2.1 If Design Approval has not been achieved by the applicable Key Date, the Supplier shall pay to the Purchaser on demand liquidated damages calculated in accordance with this Clause 13.2 for the period commencing on the applicable Key Date and ending on the actual date when Design Approval has been achieved ("**Late Design Approval**").

13.2.2 Such liquidated damages shall (without prejudice to the provisions of Clause 25) be the sole and exclusive remedy of the Purchaser in respect of such late delivery. Any liquidated damages payable shall accrue at the rate specified in the Contract Particulars.

13.2.3 The Supplier acknowledges and agrees that the amount of liquidated damages specified in Clause 13.2.1 and the Contract Particulars represent a genuine pre-estimate of the Purchaser's losses arising from Late Design Approval.

14. **REJECTION**

14.1 **Rejection**

In the event that the Purchaser, acting reasonably, at any time believes that any Goods (or any part thereof) will not meet the Product Acceptance Criteria, the Purchaser shall be entitled to notify the Supplier in writing that it rejects such Goods or relevant part (as applicable) pursuant to this Clause 14, and Clause 14.2 shall apply.

14.2 **Consequences of rejection**

Forthwith upon rejection of the relevant Goods or relevant part (as applicable) pursuant to Clause 14.1:

14.2.1 the Supplier shall, at its own cost, remove any of its equipment, plant or materials from any of the Purchaser's Premises (including the Delivery Location and the LUL Network where so instructed by the Purchaser);

14.2.2 the Supplier shall pay to the Purchaser, as a debt, the aggregate of all amounts paid by the Purchaser to the Supplier in respect of the relevant Goods or relevant part (as applicable) pursuant to this Agreement and all other reasonable costs suffered or incurred by the Purchaser in respect of rejection of such Goods or relevant part (as applicable), together with Default Interest thereon from the Commencement Date to the date of rejection.

For the avoidance of doubt the Purchaser's right to reject any Goods pursuant to this Clause 14 will be without prejudice to the Supplier's obligations under this Agreement, including Clauses 12 and 17.

15. **EXTENSIONS OF TIME**

15.1 Permitted Delays

For the purposes of this Agreement, the occurrence of one or more of the following shall constitute a "**Permitted Delay Event**":

- 15.1.1 a Force Majeure Event which prevents the Supplier from performing its obligations under this Agreement;
 - 15.1.2 any breach by the Purchaser of an express obligation under this Agreement;
 - 15.1.3 the suspension of this Agreement in accordance with Clause 18 (other than where the suspension results from the circumstance in Clause 18.3.1 or 18.3.2);
 - 15.1.4 any Variation instructed pursuant to the Variation Procedure including any Variation instructed to:
 - (A) resolve a Change in Law; or
 - (B) a conflict, inconsistency, error or discrepancy other than a Variation instructed pursuant to Clause 7.3.1;
 - 15.1.5 the Supplier is denied access to the LUL Network in the circumstances described in Clause 57.12; and
 - 15.1.6 the Purchaser exercises the Storage Option pursuant to Clause 12.2A,
- but in each case only insofar as any of the events described in Clauses 15.1.1 to 15.1.5:
- (a) has a direct and material adverse effect on the Supplier's ability to achieve any of the Key Dates or the Contractual Dates; and
 - (b) has not been caused or contributed to by the act, omission or default of the Supplier.

15.2 Qualification to Permitted Delays

Where any delay in achieving the applicable Key Date or a Contractual Date for the Goods(s) for the relevant Train arises, the Supplier shall be entitled to an extension to the applicable Key Date or a Contractual Date for the Goods but only to the extent that such delay is directly caused by a Permitted Delay Event and provided that the Supplier:

- 15.2.1 has fully complied with the requirements of Clause 15.3 and subsequently provided such further information as the Purchaser may reasonably require regarding the nature and likely duration of such event;
- 15.2.2 has provided the Purchaser with reasonable access to the Supplier's Works and/or the facilities of its Subcontractors for investigating the validity of the potential Permitted Delay Event;
- 15.2.3 has used its reasonable endeavours to mitigate the delay to the applicable Key Date or the Contractual Date for the Goods; and
- 15.2.4 shall not be entitled to an extension of time to the extent that the Permitted Delay Event was caused by or resulted from any act, neglect or default of the Supplier, its Subcontractors or the directors, agents, representatives or employees of any of them and/or any breach of this Agreement by the Supplier,

its Subcontractors or the directors, agents, representatives or employees of any of them.

15.3 Notification of Permitted Delay Event

The Supplier shall give notice to the Purchaser of the occurrence of a Permitted Delay Event promptly and in any event no later than ten (10) Working Days of when the Supplier became aware of such occurrence. Any notice given under this Clause 15.3 shall specify the Permitted Delay Event upon which the claim for an extension of time is based. Within twenty (20) Working Days (or such other period as the parties may agree) of:

15.3.1 in the case of a Permitted Delay Events under Clauses 15.1.1, 15.1.2 and 15.1.5, the Supplier serving notice on the Purchaser of such event; and

15.3.2 in the case of a Permitted Delay Event under Clauses 15.1.3 or 15.1.4, the Purchaser instructing a Variation or a suspension of this Agreement (as the case may be),

the Supplier shall provide the Purchaser with the following details:

- (a) full and detailed particulars of the cause and extent of the delay and the effect of the Permitted Delay Event on the Supplier's ability to comply with its obligations under this Agreement;
- (b) details of the documents and records which the Supplier will rely upon to support its claim for an extension of time; and
- (c) details of the measures which the Supplier has adopted and/or proposes to adopt to mitigate the consequences of the Permitted Delay Event.

Save with respect to Variations instructed under the Variation Procedure, if the Supplier fails to notify the Purchaser of any Permitted Delay Event or fails to provide details of any Permitted Delay Event, in either case within the time periods specified in Clause 15.3, the Supplier shall not be entitled to request an extension of time for that Permitted Delay Event and such event shall not constitute a Permitted Delay Event.

15.4 Grant of Extension of Time

Subject to the Supplier complying with the requirements of this Clause 15 and the Purchaser, acting reasonably, being satisfied that a Permitted Delay Event has occurred, the Purchaser shall, as soon as reasonably practicable, agree with the Supplier a reasonable extension of time to the relevant Key Date and/or Contractual Date and any such extension shall amend the Contract Programme and each relevant Key Date and/or Contractual Date.

15.5 Extensions of Time – General

15.5.1 Any extension of time agreed by the Purchaser and the Supplier under this Clause 15 to a Key Date and/or a Contractual Date shall not of itself entitle the Supplier to any extension to any other Key Date and/or Contractual Date.

15.5.2 Except as expressly provided elsewhere in this Agreement, any extension of time agreed between the Purchaser and the Supplier pursuant to this Clause 15.5 shall be in full compensation and satisfaction for any loss sustained or

sustainable by the Supplier in respect of any Permitted Delay Event in connection with which that extension is granted.

16. **TRANSFER OF TITLE AND RISK**

16.1 **Title to Items of Goods**

16.1.1 Title to each item of Goods shall pass to the Purchaser either immediately upon (i) delivery into Storage in accordance with Clause 12.2A in respect of the Goods or (ii) upon delivery to the Purchaser in respect of the relevant item of Goods (whichever is the earlier) and such title shall be full unencumbered legal and beneficial title to that item of Goods.

16.1.2 Until delivery of any item of Goods to its applicable Delivery Location (including while any item of Goods is in Storage), the Supplier shall ensure that all items of Goods are readily identifiable as the Purchaser's property, including by marking them as the Purchaser's property. The Supplier shall provide access to any premises at which such items are stored, including where the Goods are in Storage in accordance with Clause 12.2A, so that the Purchaser can verify compliance with this Clause 16.1.2.

16.2 **Risk of loss etc**

Risk of loss, theft, damage or destruction of an item of Goods shall pass to the Purchaser immediately upon delivery of the relevant item of Goods to the Delivery Location . The Supplier shall be responsible for the safe custody and transit of any item of Goods until the relevant item of Goods has been delivered to the Delivery Location.

16.3 **Warranty in respect of Title**

The Supplier warrants to the Purchaser that the title to the Goods transferred to it under this Agreement shall be with full title guarantee and free and clear of all Security.

16.4 **Prohibition on Creating Security**

The Supplier undertakes that it shall not at any time create or purport to create any Security over the Goods (including any Manual, Interface Definition Documents, Installation Instructions or other documentation) to be Product Accepted 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.

17. **DEFECT RECTIFICATION**

17.1 **Removal of defective Parts**

Where the Purchaser identifies a Defect in an item of Goods, the Purchaser shall notify the Supplier of such Defect within a reasonable time of its discovery. The Purchaser reserves the right to remove the affected item of Goods, send the affected item of Goods to the Supplier for rectification pursuant to Clause 17.2 (*Rectification of Defects*) and replace the affected item of Goods with a Spare.

17.2 **Rectification of Defects**

17.2.1 The Supplier shall:

- (a) subject to Clause 17.2.3 at its own cost, rectify (which, for the purposes of this Clause 17, means repair, replace, modify or (as appropriate) amend) each Defect which arises, occurs or becomes apparent in

relation to any item of Goods during the Defect Rectification Period for that item and where necessary shall execute or procure the execution by another of all rectification works; and

- (b) submit to the Purchaser a report identifying the root cause of the Defect within twenty-eight (28) days after having identified, or been notified pursuant to Clause 17.1, of such Defect.

17.2.2 Subject to Clause 17.2.3, the Supplier shall commence the rectification of any Defect as set out in Clauses 17.2.1 without delay and complete the rectification within a reasonable period having regard to the circumstances.

17.2.3 The Supplier agrees that the Purchaser may instruct a third party personnel or resources to carry out any rectification works on any item of Goods supplied by the Supplier to the Purchaser hereunder.

17.3 **Extended Defect Rectification Period**

Where an item of Goods and/or any Part of the same is rectified or replaced due to a Defect, the Defect Rectification Period for the that item shall be twelve (12) months from the date of repair or (as the case may be) replacement certified in writing by the Purchaser.

17.4 **Rectification by the Purchaser**

17.4.1 Subject to Clause 17.2.3, where the Purchaser identifies a Defect in an item of Goods, the Purchaser shall be entitled to remedy such Defect at any time using its own or third party personnel or resources.

17.4.2 If, in order to remedy a Defect, the Purchaser must install a Maintenance Spare on a Train, the Supplier shall provide the Purchaser with a Supplementary Spare in accordance with and within the timeframes specified in Clause 11.3A.

17.4.3 All costs and expenses properly and reasonably incurred by the Purchaser in undertaking any work pursuant to Clause 17.4.1, together with VAT chargeable thereon shall be recoverable by the Purchaser within ten (10) Working Days of demand from the Purchaser as a debt due and owing from the Supplier.

17.5 **Recurrent Defects**

If, during the Defect Rectification Period, the Parties identify that a Recurrent Defect has occurred or in the reasonable opinion of the Purchaser is reasonably likely to occur, each Party shall notify the other Party of such occurrence. The Supplier warrants to the Purchaser that it shall remedy such Recurrent Defect and undertake necessary rectification on all Goods, Spares and Parts (as appropriate), and undertake such work as may be feasible in order to enable such Goods, Spare or Part (as the case may be) to continue in operation in compliance with the terms of this Agreement pending such rectification. Within twenty (20) Working Days of having identified, or having been notified of, such Recurrent Defect, the Supplier shall submit to the Purchaser a programme for rectification of such Recurrent Defect and any necessary rectification required on any Goods, Spares or Parts (as the case may be) as soon as is practicable and the Parties shall negotiate and agree such programme in good faith, within a period of twenty (20) Working Days after receipt of such programme.

18. **SUSPENSION**

18.1 **Right to Suspend Work**

The Purchaser may at any time instruct the Supplier to suspend the design, manufacture, supply, testing, commissioning or delivery of the Goods (or any part thereof) or performance of the Services (or part thereof).

18.2 Protection of Work in Progress

The Supplier shall during any such suspension take reasonable steps to protect, secure and insure the Goods affected at the Supplier's premises (or other location agreed with the Purchaser).

18.3 Entitlement to Costs for Suspension

If a suspension occurs, the additional reasonable and documented costs incurred by the Supplier in complying with an instruction under Clause 18.1 (including those costs incurred in protecting, securing and insuring the items described in Clause 18.2) shall be reimbursed by the Purchaser save that the Supplier shall not be entitled to be paid any additional costs:

18.3.1 where the suspension arises by reason of material default on the part of the Supplier or any of its Subcontractors or suppliers or the directors, agents, representatives or employees of any of them; or

18.3.2 arising from remedying any deterioration, defect or loss caused by the Supplier's faulty workmanship or materials or by the Supplier's failure to comply with any of its obligations under this Agreement, including under Clause 18.2.

18.4 Prolonged Suspension

Unless otherwise agreed, if any suspension lasts for three hundred and sixty (360) or more days the Purchaser shall, if requested to do so by the Supplier, terminate this Agreement in accordance with Clause 25.7.

18.5 Resumption

Subject to Clause 18.4, the Purchaser may at any time instruct the Supplier to resume any activities suspended pursuant to Clause 18.1.

18.6 Making Good Deterioration

Upon receipt by the Supplier of an instruction from the Purchaser to proceed with any suspended activities pursuant to Clause 18.5, the Supplier shall examine the Goods affected by the suspension. The Supplier shall make good any deterioration or defect in or loss of such Goods that may have occurred during suspension.

18.7 Entitlement to Costs for Resumption

The additional reasonable and documented costs incurred by the Supplier in complying with an instruction under Clause 18.5 and its obligations under Clause 18.6 shall be added to the Contract Price, provided that the Supplier shall not be entitled to be paid any cost arising from:

18.7.1 remedying any deterioration, defect or loss caused by the Supplier's faulty workmanship or materials; or

18.7.2 the Supplier's failure to comply with any of its obligations under this Agreement, including under Clause 18.2.

19. **HEALTH AND SAFETY**

Where the Supplier or any of its Subcontractors carries out any work, including testing and commissioning work on the Goods on the LUL Network or any other site under the control or supervision of the TfL Group, the Supplier shall and shall procure that its Subcontractors shall:

- 19.1.1 comply with all applicable Standards and Applicable Laws and carry out such work in a manner which would be adopted by a diligent and skilled contractor;
- 19.1.2 comply with any direction or instruction (whether written or oral) given by the Purchaser or their respective employees, contractors or agents, including any direction to cease working; and
- 19.1.3 comply with Schedule 14 (*QUENSH*).

20. **PAYMENT**

20.1 **Not used**

20.2 **Payment**

Payment

- 20.2.1 In consideration of performance of the Supplier's obligations under this Agreement, the Purchaser shall pay the Supplier the amount of the Contract Price in the manner set out in this Clause 20.
- 20.2.2 Each Milestone Payment shall be sequential and no Milestone Payment shall be due to the Supplier unless and until:
 - (a) if no programme is included in Schedule 2 (*Contract Programme*), the Supplier has submitted an initial programme to the Purchaser showing the information required under Clause 8.1.1 and which is capable of acceptance in accordance with Clause 8.3.1; and
 - (b) the Performance Bond and/or the Supplier Guarantee (as applicable) are in place in accordance with Clause 22.

Payment applications

- 20.2.3 On completion of each Milestone, the Supplier shall submit a payment application for:
 - (a) the amount set out against the relevant Milestone, setting out in reasonable detail a description of the Milestone achieved; and
 - (b) any amounts due (less any payments already made) pursuant to Clause 23.3, and in accordance with the principles set out in paragraph 2 of Schedule 4 (*Contract Price*) Part 2 (*Payment*), in respect of any properly completed Variation (or, where the Parties have agreed that a Variation shall be paid on a sectional basis, in respect of any properly completed section of the Variation) provided that the Supplier's payment application sets out the details and value of any Variation payment being sought,

to the Purchaser at the address specified in Clause 36. The Supplier shall ensure that each payment application is dated and issued no earlier than the date on which the relevant Milestone and/or the Variation to which it relates has been completed.

- 20.2.4 The Purchaser shall consider the Supplier's payment application and assess and verify the amount due (the "**Milestone Payment**") in a timely manner. The Purchaser shall certify the Milestone Payment (the "**Payment Certificate**") within seven (7) days of receipt of the payment application and shall give the Supplier details of how the Milestone Payment due has been assessed. Where the Purchaser fails to comply with its obligations under this Clause 20.2.4 and there is an undue delay in considering and verifying the Milestone Payment, the Payment Certificate shall be regarded as issued for the purposes of Clause 20.2.6 after a reasonable time has passed.

VAT invoice

- 20.2.5 Within ten (10) days of receipt of the Payment Certificate the Supplier shall issue a corresponding VAT invoice for the amount of the relevant Milestone Payment, accompanied by a copy of the Payment Certificate, to the Purchaser in accordance with any instructions received from him. The Supplier shall ensure that such VAT invoice:
- (a) is dated and issued no earlier than the date when the Payment Certificate was issued; and
 - (b) clearly states the purchase order number.

Payment due date

- 20.2.6 Subject to Clause 20.3, the Purchaser shall, on receipt by it of an appropriate VAT invoice in accordance with Clause 20.2.5, pay to the Supplier within ten (10) days of receipt by it of such VAT invoice the relevant Milestone Payment calculated in accordance with Clause 20.2.4. If the Supplier fails to issue a VAT invoice that complies with the requirements of this Clause 20 then the Purchaser shall be under no obligation to pay the same.

Payments owed by Supplier

- 20.2.7 Where a payment application shows a net amount owed by the Supplier to the Purchaser the Supplier shall pay the amount to the Purchaser within thirty (30) days of such application being provided to the Purchaser or, at the option of the Purchaser, carry forward that amount to the next Milestone Payment application in reduction of amounts which would otherwise have been owed by the Purchaser to the Supplier.

Payment recovery

- 20.2.8 Any payment made by the Purchaser under this Agreement does not prevent the Purchaser from recovering any amount over-paid or wrongfully paid however such payment may have arisen, including but not limited to, those amounts paid to the Supplier by mistake of law or fact.

Late payment

20.2.9 Save where otherwise specifically provided where any payment or sum of money due from one Party to the other Party under any provision of this Agreement is not paid in accordance with the timescales set out in this Agreement and providing that there has been no Dispute in respect of the sums therein, without prejudice to the Parties' other rights under the Agreement, that sum shall bear simple interest thereon from the due date until payment is made in full at the Default Interest rate current at the date a payment under this Agreement becomes overdue. The Parties agree that this is a substantial remedy for late payment of any sum payable under this Agreement in accordance with section 8(2) of the Late Payment of Commercial Debts (Interest) Act 1998. The Supplier is not entitled to suspend works under the Agreement or delivery of the Goods as a result of any sums being outstanding.

20.3 **Disputed Payment Applications**

The Purchaser shall notify the Supplier in writing of any disputed amounts or payment applications stating the reasons for such dispute within seven (7) days of receipt of such payment application, and any dispute shall be resolved in accordance with Clause 32. In the event of any disputed payment application, the undisputed element of such payment application shall be certified by the Purchaser in accordance with this Clause 20.

20.4 **Exchange Rate Risk**

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 Supplier from the Commencement Date, subject to the application of the Financial Close Protocol.

21. **VAT**

21.1 **Payment of VAT**

The Contract Price is, unless otherwise stated, exclusive of VAT. To the extent that VAT is properly chargeable in respect of the Contract Price and the Supplier is liable to account for such VAT to any Competent Authority, such VAT shall be charged by the Supplier to the Purchaser at the rate in force on the date of the relevant payment application and must be shown as a separate amount on such payment application and shall accordingly be paid by the Purchaser to the Supplier. To the extent that VAT is chargeable in respect of the Contract Price and the Purchaser is liable to account for such VAT to any Competent Authority, the Contract Price shall not be affected by such VAT and no additional payments in respect of such VAT shall be made by the Purchaser to the Supplier pursuant to this Agreement but the Purchaser shall instead account for such VAT to the relevant Competent Authority.

21.2 **Reimbursement of VAT**

Where under this Agreement one Party is to reimburse or indemnify another Party in respect of any payment made or cost incurred by the other Party, the first Party shall also reimburse any VAT paid by the other Party in question which forms part of its payment made or cost incurred to the extent such VAT is not available for credit for the other Party in question (or for any person with whom the indemnified party is treated as a member of a group for VAT purposes).

21.3 **VAT Credit Note to be Issued on Repayment**

Where under this Agreement any rebate or repayment of any amount is payable by one Party to another Party, and the first Party is entitled as a matter of law or of HM Revenue and Customs practice to issue a valid VAT credit note, such rebate or repayment shall be paid together with an amount representing the VAT paid on that part of the consideration in respect of which the rebate or repayment is made, and the first Party shall issue an appropriate VAT credit note to the other Party in question.

22. SECURITY

22.1 Performance Bond

22.1.1 Where the Contract Particulars specify a Performance Bond is required, this Clause 22.1 shall apply.

22.1.2 On or prior to the date of this Agreement, the Supplier shall procure at its cost a valid and effective Performance Bond in favour of the Purchaser. The Performance Bond shall:

- (A) be in the amount stated in the Contract Particulars;
- (B) substantially in the form set out in Schedule 11 (*Form of Performance Bond*);
- (C) expire upon the date of Fleet Acceptance; and
- (D) be duly executed and delivered by a Bond Provider.

22.2 Supplier Guarantee

22.2.1 Where the Contract Particulars specify a Supplier Guarantee is required, this Clause 22.2 shall apply.

22.2.2 On or prior to the date of this Agreement, the Supplier shall procure at its cost a valid and effective Supplier Guarantee in favour of the Purchaser. The Supplier Guarantee shall:

- (A) substantially in the form set out in Schedule 7 (*Form of Supplier Guarantee*);
- (B) expire upon the date of Fleet Acceptance; and
- (C) be duly executed and delivered by the Supplier Guarantor.

22.3 Replacement Bonds

22.3.1 If at any time:

- (A) a Performance Bond ceases to be in full force and effect;
- (B) the Bond Provider's obligations under the Performance Bond are or become wholly or partly invalid or unenforceable;
- (C) the Bond Provider ceases to meet the Required Rating; or
- (D) an Insolvency Event occurs in relation to a Bond Provider;

then the Supplier shall provide a replacement Performance Bond (as the case may be) issued by a Bond Provider and that otherwise complies with this Clause

22 within ten (10) Working Days of the Performance Bond (as the case may be) ceasing to meet the relevant requirement(s) of this Clause 22.3.

22.3.2 In the event that the Supplier does not provide a replacement Performance Bond in accordance with Clause 22.3.1, the Purchaser may at its option:

- (a) make a demand upon the full amount (or remaining balance thereof if a demand or demands have already been made) of the Performance Bond which amount shall be paid to the Purchaser and retained by the Purchaser pending receipt of a replacement Performance Bond meeting the requirements of this Clause 22 (provided that if, prior to receipt of such Performance Bond this Agreement is terminated, the Purchaser may apply such amount towards any sums owing to it under this Agreement); or
- (b) procure the issue of a replacement Performance Bond meeting the requirements of this Clause 22 and invoice the Supplier for the cost thereof. The Supplier shall reimburse the Purchaser for the amount of such cost, together with Default Interest from the date of such invoice until the date on which the invoice is paid.

23. VARIATION PROCEDURE

23.1 Right to request a quote

23.1.1 The Purchaser may, at any time prior to instructing a Variation, request the Supplier to provide, in writing, a quotation in respect of any variation envisaged, such quotation to detail any adjustment to the Contract Price and any effect on the Contract Programme as a result of implementing the proposed variation (the "**Variation Quote**").

23.1.2 The Supplier shall:

- (a) provide the Purchaser with a Variation Quote within five (5) Working Days (or such longer period as the Purchaser may agree) of a request from the Purchaser; and
- (b) hold its Variation Quote open for ninety (90) Working Days and shall endorse the Variation Quote to this effect.

23.1.3 The Purchaser may, in its absolute discretion, accept the Variation Quote and instruct a Variation in accordance with Clause 23.2.1, and the remaining provisions of this Clause 23.1 shall apply in respect of such Variation.

23.1.4 The Supplier shall be responsible for all costs and expenses associated with the preparation of any Variation Quote.

23.2 Right to vary

23.2.1 The Purchaser may at any time until the date of the Fleet Acceptance Certificate instruct the Supplier in writing to proceed with a Variation of any kind in accordance with the provisions of this Clause 23.2.

23.2.2 Upon instruction of a Variation by the Purchaser, the Supplier shall carry out such Variation and be bound by the terms of this Agreement in so doing, as though the Variation was stated in the Agreement.

- 23.2.3 Nothing in this Clause 23.2 shall prevent the Supplier from making a proposal to the Purchaser for a Variation but no Variation so proposed shall be carried out by the Supplier except as directed in writing by the Purchaser.

23.3 **Valuation of Variations**

- 23.3.1 As soon as possible after having received any instruction under Clause 23.2, the Supplier shall notify the Purchaser if, in the Supplier's opinion, the Variation will involve an adjustment to the Contract Price (the "**Variation Valuation**").

- 23.3.2 Subject to Clause 23.3.3, the Variation Valuation shall, if not the subject of a Variation Quote from the Supplier which has been accepted by the Purchaser in accordance with Clause 23.1.3, be determined by the Purchaser:

- (A) in the case of a Variation instructed pursuant to Clause 11.4, in accordance with the prices stated in the price list set out in Schedule 3 (*Spares*) Part B (*Additional Spares*) in the case of a Spare of the kind listed in that list and otherwise at cost plus 3%;
- (B) in all other cases, in accordance with the rates and prices set out in Schedule 4 (*Contract Price*) or, to the extent that such rates are not applicable, on a fair and reasonable basis in all the circumstances reflecting, so far as possible, the then current market rates.

Due account shall be taken of any partial performance of the Agreement which is rendered useless by any such Variation.

- 23.3.3 The Supplier shall not be entitled to any increase in the Contract Price with respect to any Variation:

- (A) instructed pursuant to Clause 7.3.1; or
- (B) to the extent that it was directly or indirectly caused by or resulted from any act, neglect, default or breach of this Agreement by the Supplier its Subcontractors or suppliers or the directors, agents, representatives or employees of any of them or to the extent that the Supplier has failed to take all reasonable steps to mitigate any actual or potential increase in the Contract Price.

23.4 **Notice of variations**

- 23.4.1 When instructing any Variation, the Purchaser shall, to the extent possible, give the Supplier such reasonable notice as will enable him to make his arrangements accordingly.

23.5 **Progress with variations**

- 23.5.1 The Supplier shall, on receipt of an instruction from the Purchaser to proceed with a Variation, immediately proceed to carry out such Variation in accordance with its terms notwithstanding that the Variation Valuation has not yet been determined. The carrying out of the Variation by the Supplier shall not, without the prior written consent of the Purchaser, be delayed pending determination of the Variation Valuation in accordance with Clause 23.3.2.

- 23.5.2 The Parties shall enter into such amendments to this Agreement to give effect to any Variation instructed by the Purchaser pursuant to Clause 23.2.1.

24. **INTELLECTUAL PROPERTY RIGHTS**

24.1 **Not used**

24.2 **Licence of Supplier IPR**

The Supplier grants, or shall procure the grant of, to the Purchaser a non-exclusive, perpetual, irrevocable, royalty-free, sub-licensable and transferable licence to use the Supplier IPR, Software and Source Code for:

- 24.2.1 the testing, commissioning, operation, maintenance, modification, refurbishment or sale of the Goods or any related activity, or permitting the Purchaser to use the Goods and/or any other item to be supplied pursuant to this Agreement for the purposes envisaged pursuant to the Specification;
- 24.2.2 modifying, refurbishing, repairing, maintaining and overhauling the Goods, supplied pursuant to this Agreement or any related activity;
- 24.2.3 complying with all Applicable Laws, LU Standards and all Relevant Consents;
- 24.2.4 using and copying the Manuals and/or Interface Definition Document and/or Installation Instructions in order to perform any of the above;
- 24.2.5 training personnel to carry out any of the activities described in Clause 24.2.1, 24.2.2 and 24.2.4;
- 24.2.6 inviting tenders for any of the activities described in Clause 24.2.1 to 24.2.5 inclusive;
- 24.2.7 in the event of termination of this Agreement, procuring fulfilment and performance of the Supplier's obligations under this Agreement, including the manufacture of any Parts and Spares or other equipment for use in connection with the Goods; and
- 24.2.8 the Purchaser performing its obligations under this Agreement.

Other than in accordance with this Clause 24, the Purchaser shall not, and no party to whom it sub-licences or transfers any rights under this Clause 24 shall, have the right to manufacture (i) the Goods or (ii) any Part that is the subject of Supplier IPR.

24.3 **Subcontractors**

The Supplier shall ensure that all Subcontracts entered into by the Supplier shall permit the Supplier to assign or novate its rights and obligations under such agreement relating to any Intellectual Property Rights to the Purchaser without the consent of the relevant Subcontractor and such Subcontracts shall specify the Purchaser as a permitted assignee.

24.4 **Documentation**

The Supplier 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 24 at no cost to the Purchaser.

24.5 **Warranties**

The Supplier represents and warrants to the Purchaser that:

- 24.5.1 the Supplier IPR, and the Software constitute all the Intellectual Property Rights required by the Purchaser for the purposes of this Agreement;
- 24.5.2 it has the right and power to grant the licence set out in Clause 24.2; and
- 24.5.3 use of any Supplier IPR, Software, the Goods, Part, Supplier Documentation or part thereof does not infringe any Intellectual Property rights of another person.

24.6 **Indemnity**

The Supplier shall indemnify the Purchaser and any member of the TfL Group as provided for in Clause 29.2 against any claim for infringement of any Intellectual Property Rights.

24.7 **Remedy for Infringement**

Without prejudice to the provisions of Clauses 24.5 and 29.2.4, if the use of any Supplier IPR, Software, Goods and/or Part thereof is, or in the reasonable opinion of the Purchaser is likely to become, an infringement of the Intellectual Property Rights of another person, the Supplier shall, at its cost, either:

- 24.7.1 procure for the Purchaser the right to continue to use that Supplier IPR, Software, Goods and/or Part; or
- 24.7.2 (to the extent Clause 24.7.1 is not applicable) modify the Goods and/or Part so that it no longer infringes those rights, or replace the item of Goods with a non-infringing Goods and/or Part provided however that the modified or replacement Goods and/or Part shall at all times comply with all the requirements of this Agreement.

24.8 **Software**

24.8.1 The Supplier shall ensure in respect of all Software that is used for the design, manufacture, testing, commissioning, supply, operation, maintenance, modification, refurbishment or sale of the Goods that:

- (a) 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 design process;
- (b) the documentation for 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
- (c) where no particular LU Standard is specified by the Specification, it is designed and documented following a nationally or internationally recognised standard using recognised quality control methods.

The Supplier shall provide copies of the documentation and information at Clause (a) and (b) above to the Purchaser on the request of the Purchaser.

24.8.2 The Supplier shall in respect of Supplier-owned Software, at all times during the period from the Commencement Date until the end of the thirty (30) year design life of the Goods:

- (a) 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);
- (b) retain updated usable copies of any ancillary computer programmes used to generate such codes (such as, without limitation, compilers);
- (c) subject to the provisions of any Escrow Agreement entered into under Clause 24.11, keep copies of the materials referred to in this Clause 24.8.2 in a secure manner and place such that they will not deteriorate;
- (d) retain the Software designed by the Supplier; and
- (e) allow the Purchaser reasonable access to the Software and the Source Code and its documentation.

24.9 **Cessation of Software Support**

If the Supplier or any Subcontractor supplying any of the Software stops trading or makes known its intention to withdraw support for that Software, the Supplier shall, without additional charge (save where the Subcontractor stops trading or makes such intention to withdraw support known in which case the Purchaser shall pay the reasonable and properly incurred costs of the Supplier in complying with this Clause 24.9), use reasonable endeavours to procure the transfer to the Purchaser of all rights in and to the Software in question for the relevant type of Goods.

24.10 **Survival**

Each licence granted under this Clause 24 and/or any liability arising in connection with the same shall survive the termination of this Agreement.

24.11 **Escrow**

Within twenty (20) Working Days of the Commencement Date the Supplier shall execute the Escrow Agreement. The Supplier shall place the Escrow Materials 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 twenty (20) Working Days thereof. The Supplier shall pay all fees of the Escrow Agent in connection with the placement, storage and release of the Escrow Materials and shall provide evidence of the same to the Purchaser on written request.

25. **TERMINATION**

25.1 **Supplier Events of Default**

The occurrence of one or more of the following shall constitute a Supplier Event of Default:

- 25.1.1 the Supplier commits a material breach of its obligations under this Agreement;
- 25.1.2 the Supplier commits a Persistent Breach as provided for in Clause 25.4;
- 25.1.3 the Supplier commits a breach of Clause 10.1;
- 25.1.4 the maximum amount of liquidated damages payable by the Supplier pursuant to Clause 13 shall have accrued; ;

- 25.1.5 an Insolvency Event occurs in relation to the Supplier;
- 25.1.6 the Supplier fails to make payment of any sum (including any liquidated damages) not in dispute when due and payable to the Purchaser in accordance with this Agreement within thirty (30) days of a written demand for payment;
- 25.1.7 the Supplier fails to take out and/or maintain any of the Required Insurances in accordance with Schedule 9 (*Insurance*);
- 25.1.8 the Supplier fails to provide (where the Contract Particulars specify, a Performance Bond is required) a Performance Bond or any replacement thereof in accordance with Clause 22.3;
- 25.1.9 Product Acceptance for the Goods still has not occurred by the Fleet Acceptance Longstop Date,
- 25.1.10 (where the Contract Particulars specify a Supplier Guarantee is required,) the Supplier Guarantor's obligations under the Supplier Guarantee are or become wholly or partly invalid or unenforceable or the Supplier Guarantor fails to comply promptly with any of its obligations pursuant to the Supplier Guarantee;
- 25.1.11 there is a breach by the Supplier of its obligations under Clause 34; or
- 25.1.12 the Supplier fails to remedy an Equality & Diversity Infraction to the satisfaction of the Purchaser or fails to terminate its Subcontract with a defaulting Subcontractor in accordance with and within the timeframes specified in paragraph 1.6 of Schedule 17 (*Responsible Procurement*) Part A (*Equality and Supplier Diversity*);
- 25.1.12 without the Purchaser's written consent, at any time a person (or persons acting together) takes a controlling interest in the Supplier's share capital, and for this purpose, a "**controlling interest**" being either:
 - (A) the ownership or control (directly or indirectly) of more than 30% of the Supplier's voting share capital or the share capital of the Supplier's holding company; or
 - (B) the ability to direct the casting of more than 30% of the votes exercisable at the Supplier's general meetings or those of the Supplier's holding company on all, or substantially all, matters;
- 25.1.13 a Service Provider Public Procurement Termination Event and/or a Supplier Public Procurement Termination Event occurs.

25.2 **Procedures in relation to Termination for a Supplier Event of Default**

- 25.2.1 The Supplier shall notify the Purchaser forthwith on the Supplier becoming aware of the occurrence of a Supplier Event of Default.
- 25.2.2 Following the occurrence of a Supplier Event of Default (and notwithstanding that the Supplier may not have notified it pursuant to Clause 30.2.1), the Purchaser may by notice in writing to the Supplier ("**Purchaser Termination Notice**") specifying the Supplier Event of Default in question terminate this Agreement either in respect of all of the Goods which have not been Accepted for Service or (as specified in the notice) in relation to specific items of Goods which have not been Accepted for Service, such termination to take effect from the date specified in the Purchaser Termination Notice (being not less than

seven (7) days after the date of the Purchaser Termination Notice or, in the case of Insolvency, forthwith) provided that, in respect of a Supplier Event of Default under Clauses 25.1.1, 25.1.3 or 25.1.6 which is capable of remedy, the provisions of Clause 25.3 shall apply.

25.2.3 This Clause 25.2. shall be without prejudice to the Purchaser's right to termination implied into this Agreement by Regulation 73(3) of the Public Contracts Regulations 2015.

25.3 Remedial Plan

25.3.1 Where a Supplier Event of Default that is capable of remedy arises under Clauses 25.1.1, 25.1.3 or 25.1.6, the Purchaser shall by notice in writing to the Supplier signed on behalf of the Purchaser (a "**Remedy Notice**") require the Supplier either

- (a) to remedy such breach(es) referred to in the Remedy Notice within thirty (30) Working Days of that notice or
- (b) within ten (10) Working Days of the Remedy Notice, to put forward a plan (a "**Remedial Plan**") acceptable to the Purchaser in its absolute discretion to remedy the breach(es) referred to in the Remedy Notice. Such Remedial Plan shall be in writing and shall specify the proposed remedy in reasonable detail and the latest date by which it is proposed that that remedy will be completed.

25.3.2 Where the Supplier puts forward a Remedial Plan in accordance with Clause 25.3.1, the Purchaser shall notify the Supplier in writing within twenty (20) Working Days of receipt of the Remedial Plan that it does not accept the Remedial Plan. If the Purchaser does not so notify the Supplier, the Purchaser shall be deemed to have accepted the Remedial Plan.

25.3.3 If the Purchaser notifies the Supplier that it does not accept that Remedial Plan pursuant to Clause 25.3.2, the Purchaser and the Supplier shall use reasonable endeavours in the following ten (10) Working Days to agree any necessary amendments to the Remedial Plan in order for it to be acceptable to the Purchaser. In the absence of agreement in that period of ten (10) Working Days, the Purchaser may treat the Supplier Event of Default as not being capable of remedy and terminate this Agreement in accordance with Clause 25.2.2 (notwithstanding the proviso thereto). Where the Purchaser and the Supplier agree the form of the Remedial Plan, the Supplier shall forthwith implement such Remedial Plan in accordance with its terms.

25.3.4 If any breach specified in a Remedy Notice served under Clause 25.3.1 is not remedied

- (a) within the thirty (30) Working Day period specified in Clause 25.3.1(a) (if applicable); or
- (b) in accordance with a Remedial Plan that has been accepted or deemed accepted by the Purchaser, or the Supplier otherwise fails to comply with the terms of that Remedial Plan,

then the Purchaser may exercise its rights under Clause 25.2.2 as if the Supplier Event of Default is not capable of remedy.

25.4 Persistent breach

25.4.1 If the Supplier breaches any of its obligations (where those obligations are of the same type or nature) under this Agreement, more than twice in any three (3) month period, then the Purchaser may serve a notice on the Supplier:

- (A) specifying that it is a formal warning notice;
- (B) giving reasonable details of such breach; and
- (C) stating that such breach is a persistent breach that, if it continues unremedied or if a breach of the same type or nature occurs within three (3) months of the date of service of the notice, may result in a termination of this Agreement in accordance with this Clause 25.4.

25.4.2 If, following service of such a warning notice pursuant to Clause 25.4.1, the breach specified has continued unremedied or a breach of the same type or nature has occurred within the three (3) months following the date of service of such notice, then the Purchaser may, no later than the date falling six (6) months following the date of service of the warning notice pursuant to Clause 25.4.1, serve another notice on the Supplier specifying that such breach constitutes a "**Persistent Breach**" for the purposes of Clause 25.1.2.

25.5 Consequences of Termination for Supplier Fault

25.5.1 Where the Purchaser has served (a) a Purchaser Termination Notice in accordance with Clause 25.2.2 (and, where relevant, the Supplier Event of Default has not been remedied pursuant to Clause 25.3), or (b) a notice of termination under Clause 33.3 (*Prohibited Acts*), the Purchaser shall be entitled (in its absolute discretion) to:

- (a) procure the completion of the Goods so that they satisfy the conditions necessary for the passing of title to the Purchaser and, upon completion, pay to the Supplier that part of the Contract Price for the Goods and any other item of Goods not yet paid as at the date of termination less the cost of completion including procurement of the same. Where this gives rise to a negative figure, the corresponding positive amount will be payable by the Supplier to the Purchaser together with Default Interest (calculated from the date of termination of this Agreement to the date of payment by the Supplier); or
- (b) purchase any work in progress, wholly or partly manufactured Goods at an amount representing a fair assessment of the value of the Goods, less an amount equal to those instalments of the Contract Price and/or any advance payments already paid by the Purchaser in respect of such Goods; or
- (c) be reimbursed for all payments made to the Supplier in relation to the supply of the Goods (other than those in respect of which title has transferred to the Purchaser pursuant to Clause 16). The amount to be reimbursed shall attract Default Interest (calculated from the date of termination of this Agreement to the date of payment by the Supplier);
- (d) if Termination occurs prior to Acceptance for Service of the first Train, return any Goods in the possession of the Purchaser and be reimbursed for all payments made to the Supplier. The amount to be reimbursed shall attract Default Interest (calculated from the date of termination of this Agreement to the date of payment by the Supplier).

25.5.2 Subject to Clause 29.4, if this Agreement is terminated at any time between the Commencement Date and the Fleet Acceptance as a result of:

- (a) the occurrence of a Supplier Event of Default in accordance with Clause 25.2.2 (and, where relevant, the Supplier Event of Default has not been remedied pursuant to Clause 25.3); or
- (b) the occurrence of a Prohibited Act in accordance with Clause 33,

the Supplier shall, in addition to any amounts payable pursuant to Clause 25.5.1 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 of this Agreement including, but not limited to:

- (i) the costs of procuring a replacement contract 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) the costs of the Purchaser procuring replacement Goods; and
- (iv) the cost of satisfying any outstanding Preconditions relating to the first Train.

25.6 **Additional Remedies**

Without prejudice to Clause 38, where this Agreement has been terminated pursuant to Clause 25.2, 33.3, 33.4, 53.2, 54.5 or 56.10, the Purchaser shall be entitled to require the Supplier:

- 25.6.1 to assign the benefit of any warranties which have been given by any third parties, Subcontractors or suppliers to the Supplier in respect of the Goods; or
- 25.6.2 to provide all drawings of all Parts and all design, technical and maintenance records relating to the Goods including all Manuals, Interface Definition Document and Installation Instructions relating to the Goods save to the extent the same have already been provided in accordance with this Agreement and such information shall be treated as Supplier IPR for the purposes of this Agreement.

25.7 **Voluntary Termination**

The Purchaser may terminate this Agreement without cause at any time by giving notice to the Supplier of such termination and the date when such termination shall become effective and the termination shall take effect upon such date.

25.8 **Declaration of Ineffectiveness and Public Procurement Termination Event**

The Purchaser may terminate this Agreement at any time in the event that:

- 25.8.1 there is a Declaration of Ineffectiveness

25.8.2 a Public Procurement Termination Event or Service Provider Public Procurement Termination Event occurs (without prejudice to the Purchaser's rights of termination implied into this Agreement by Regulation 73(3) of the Public Contracts Regulations 2015).

25.9 In the event that this Agreement is terminated pursuant to Clause 25.8, the provisions of Clause 25.10 shall apply.

25.10 Consequences of Voluntary Termination, Declaration of Ineffectiveness or Public Procurement Termination Event

25.10.1 Not used

25.10.2 Where this Agreement is terminated by the Purchaser in accordance with Clause 25.7, the Purchaser shall pay to the Supplier:

(A) an amount equivalent to the amount that would be payable by the Purchaser to the Supplier in respect of a termination as a result of a Force Majeure Event in accordance with Clause 25.11; and

(B) provided that, where the amount would be a negative figure, the corresponding positive amount shall be payable by the Supplier to the Purchaser on the same basis as set out in Clause 25.5.1(a); and

(C) subject to Clauses 25.10.3 to 25.10.5 inclusive, the costs, expenses and other liabilities reasonably and properly incurred by the Supplier as a direct result of the termination of this Agreement provided that the Supplier shall use all reasonable endeavours to mitigate such costs, expenses and/or other liabilities.

The Supplier shall not be entitled to payment of any other loss and/or damage arising from such termination.

25.10.3 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 Supplier as a direct result of termination of this Agreement and determine whether the amount of such costs, expenses and/or liabilities were properly and reasonably incurred by the Supplier as a direct result of the termination of this Agreement.

25.10.4 Where the Purchaser exercises its rights pursuant to Clause 25.10.3, it shall give written notice to the Supplier 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 Supplier shall cooperate with the Independent Auditor and grant the Independent Auditor the same rights of audit as the Purchaser enjoys under this Agreement.

25.10.5 The Purchaser shall procure that the Independent Auditor provides a copy of its decision in writing (together with reasons for its decisions) to the Supplier. 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 Supplier as a direct result of termination of this Agreement, the Purchaser shall not be obliged to pay such amount to the Supplier.

25.10.6 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 Supplier, in which case the costs incurred by the Independent Auditor in undertaking the audit shall be borne by the Supplier.

25.10.7 In the event the Supplier disputes any findings of the Independent Auditor, such Dispute shall be referred for resolution in accordance with Clause 32.

25.11 **Consequences of Termination for Force Majeure**

25.11.1 Where this Agreement is terminated in whole or in part by the Purchaser as a result of a Force Majeure Event in accordance with Clause 27, the Purchaser will acquire any:

- (a) Design that has been produced in connection with this Agreement prior to the date of service upon the Supplier of the FM Notice; and
- (b) partially completed Goods or other item of Goods that is the subject of the FM Notice.

25.11.2 The value of the Purchaser's acquisition will be assessed, where appropriate, in accordance with Schedule 4 (*Contract Price*) (and in particular the Contract Price Breakdown contained in Schedule 4 (*Contract Price*) Part 3 (*Contract Price breakdown*)) or, to the extent that this is not appropriate due to the level of Design development, the costs and expenses reasonably and properly incurred by the Supplier in carrying out its obligations under this Agreement less the amount of progress or advance payments made to the Supplier. Where this gives rise to a negative figure, the corresponding positive amount shall be payable by the Supplier to the Purchaser on the same basis as set out in Clause 25.5.1(a).

25.12 **Consequences of Termination for other reasons**

Where this Agreement is terminated by the Purchaser under Clause 33.3, 33.4, 53.2, 54.5 or 56.10, the provisions of Clause 25.5 and 25.6 shall apply.

25.13 **Rejection**

This Clause 25 shall not apply to any rejection of the Goods pursuant to Clause 14.

26. **SURVIVAL OF CLAUSES**

26.1 **Consequence of Termination or Expiry**

Upon termination or expiry of this Agreement, whether in respect of any one item of Goods or all Goods, the obligations of the Parties under this Agreement in respect of the terminated Goods shall cease except for:

- 26.1.1 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
- 26.1.2 the provisions of Clauses 1, 3A, 5, 6.7, 10.2 to 10.7 inclusive, 17, 20, 21, 22, 0, 25.5, 25.6, 25.11, 25.12, 25.13, 26, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 47 and 51 and the related Schedules referred to in or required to give effect to those Clauses which shall survive the termination or expiry of this Agreement and continue in full force and effect.

27. **FORCE MAJEURE**

27.1 **Consequence of a Force Majeure Event and Notification Requirements**

No Party shall be in breach of an obligation under this Agreement to the extent that it is unable to perform that obligation in whole or in part by reason of the occurrence of a Force Majeure Event provided that:

27.1.1 if any Party seeks to rely on this Clause 27 (the "**FM Affected Party**"), 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, the FM Affected Party shall notify the other Parties in writing of the act, event or circumstance relied on as a Force Majeure Event; and

27.1.2 within a further five (5) Working Days, the FM Affected Party shall notify the other Parties in writing of the date on which such act, event or circumstance commenced, including an estimate of the period of time required to overcome it and its effects, details of any failure by the FM Affected Party to perform its obligations under this Agreement, the effect on the FM Affected Party's ability to perform its obligations under this Agreement and the action being taken to mitigate its consequences in accordance with Clause 27.2 below.

27.2 **Mitigation**

27.2.1 An FM Affected Party shall:

- (A) make all reasonable efforts to mitigate the effects of the claimed Force Majeure Event (including, in the case of the Supplier, complying with the requests of the Purchaser and, in relation to the Supplier's Works, using all reasonable endeavours to find alternative facilities at which to carry out its obligations), to continue to perform its obligations under this Agreement and to resume performance as soon as possible;
- (B) shall furnish written reports every seven (7) days to the other Party on its progress in doing so 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
- (C) shall provide any information relating to the claimed Force Majeure Event and its effects that the other Party may reasonably request.

27.2.2 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 27.2.1 above.

27.3 **Extensions of Time for Force Majeure**

Subject to Clauses 27.2 and 27.4 the occurrence of a Force Majeure Event which directly causes delay to the supply of the Goods and/or any other item of Goods will constitute a Permitted Delay Event and the provisions of Clause 15 shall apply.

27.4 **Termination for Force Majeure**

Notwithstanding the provision of Clause 27.3 entitling the Supplier to a Permitted Delay Event, the Purchaser shall be entitled to terminate this Agreement by notice in writing (a "**FM Notice**") to the Supplier if the Acceptance for Service of the Goods or other item of

Goods has been or would be delayed as the result of a Force Majeure Event for more than an aggregate total of ninety (90) days following the Contractual Date for such Goods or other item. The provisions of Clause 25.12 shall apply in respect of such termination.

27.5 **Effect on payments**

If a Force Majeure Event results in the Supplier being unable to carry out its obligations, the Purchaser shall cease to be liable to make any payment which would otherwise have been due on fulfilment of that obligation until and to the extent that the Supplier has performed that obligation.

27.6 **Cessation of Force Majeure**

Immediately after the end of the Force Majeure Event, the FM Affected Party shall notify the other Party in writing that the Force Majeure Event has ended and shall resume performance of its obligations under this Agreement insofar as the Agreement has not been terminated or varied in accordance with Clause 27.4.

27.7 **Continuing Obligations**

The Parties shall not be released from any of their obligations under this Agreement as a result of a Force Majeure Event, and this Agreement shall, subject to Clause 27.4, remain in effect for the duration of a Force Majeure Event.

28. **INSURANCE**

The Supplier and the Purchaser shall comply with the requirements of the insurance regime set out in Schedule 9 (*Insurance*).

29. **INDEMNITIES AND LIMITATIONS ON LIABILITY**

29.1 **Application**

The provisions of this Clause 29 shall apply notwithstanding any other provision of this Agreement.

29.2 **General Indemnities**

Subject to Clause 29.3, the Supplier shall be liable for and shall indemnify on demand on an after-Tax basis the Purchaser and TfL and any member of the TfL Group, including any of their respective employees, servants, agents, subcontractors, suppliers, directors, representatives and officers (each an "**Indemnified Party**" and together the "**Indemnified Parties**"), against all expenses, liabilities, losses, damages, claims, costs, demands, proceedings and Taxes whatsoever suffered or incurred or arising out of:

29.2.1 death or personal injury to any person;

29.2.2 any loss of, or damage to, any property or assets (including the LUL Network, the Goods or any other item of Goods);

29.2.3 any third party actions, claims, demands, costs, charges and expenses (including legal expenses on an indemnity basis) brought against any Indemnified Party;

29.2.4 breach of statutory duty;

29.2.5 any Environmental Damage;

arising from or in connection with:

- (a) the design, manufacture, supply, assembly, testing, commissioning and delivery of the Goods (and/or any subsystem or Part forming part of the Goods) ; and/or
- (b) the operation and/or use of the Goods in accordance with Manuals or Installation Instructions or as otherwise directed by the Supplier;
- (c) the performance or non-performance (including any negligent performance) of the obligations of the Supplier, its Subcontractors or suppliers or the directors, agents, representatives or employees of any of them under or in connection with this Agreement;
- (d) any acts or omissions, breach, negligence or wilful misconduct by the Supplier.

29.3 **Qualifications**

The Supplier shall not be liable to indemnify any Indemnified Party under the indemnity in Clause 29.2 in the case of any loss referred to in Clauses 29.2.1 and 29.2.2 to the extent that it results from negligence or breach of duty on the part of any Indemnified Party.

29.4 **Limitation on Supplier's Liability**

29.4.1 Subject to Clause 29.4.2, the Supplier's liability to the Indemnified Parties under this Agreement (whether arising in contract, tort (including negligence, breach of statutory duty or otherwise)) shall be limited as set out in the Contract Particulars.

29.4.2 The Supplier's liability to the Indemnified Parties under this Agreement in respect of the Excepted Liabilities shall not be subject to the limits referred to in Clause 29.4.1.

29.5 **Consequential Breach and Loss**

29.5.1 Neither the Supplier nor the Purchaser shall be treated as being in breach of this Agreement if such breach arises as a direct, necessary and inevitable consequence of the occurrence of a breach thereof on the part of the other Party.

29.5.2 Other than in respect of Excepted Liabilities, neither Party shall be liable for any matter howsoever arising out of or in connection with this Agreement (including Clause 29.2) in respect of any Consequential Loss. Each Party respectively undertakes not to sue the other Party, (or make any claim against that Party), the Purchaser or any member of the TfL Group in respect of Consequential Loss.

29.6 **No Double Recovery**

No Indemnified Party shall be entitled to recover (by way of indemnity or otherwise) more than once in respect of the same loss or damage suffered under this Agreement and/or any document entered into in connection with or pursuant to this Agreement. There shall be no duplication solely by reason of there being multiple beneficiaries to a claim hereunder.

29.7 **Duty to Mitigate**

The Supplier and the Purchaser shall each be under a duty to mitigate any damages and losses in respect of which it makes any claim pursuant to this Agreement.

30. **CONFIDENTIALITY**

30.1 **Obligations of Confidentiality**

Subject to Clause 30.2 the contents of this Agreement, any documents referred to in this Agreement and any information whether written or oral, provided by the Purchaser to the Supplier or by the Supplier to the Purchaser in connection with this Agreement shall be treated by the recipient as confidential ("**Confidential Information**"). The Purchaser and the Supplier shall not (and shall procure that their respective subcontractors, suppliers, officers, employees, advisers and agents and the officers, employees, advisers and agents of their subcontractors and suppliers shall not) without the prior written consent of the other Party or by failure to exercise due care or otherwise by any act or omission:

- 30.1.1 disclose Confidential Information to any person whomsoever;
- 30.1.2 use or exploit Confidential Information commercially for its or their own purposes other than in connection with the performance of this Agreement; or
- 30.1.3 use Confidential Information otherwise than for the purpose for which it was provided.

30.2 **Permitted Disclosure**

Without prejudice to the Purchaser's rights under its licence granted pursuant to Clause 24.2, the restrictions in Clause 30.1 shall not apply to the disclosure of Confidential Information:

- 30.2.1 in accordance with any requirement under any Applicable Law (including pursuant to Clause 31) or LU Standard to do so;
- 30.2.2 to the disclosing Party's respective professional advisers and auditors who are bound to such Party by a duty of confidentiality which applies to any information disclosed;
- 30.2.3 to any banks and financial institutions providing finance, or advising on or envisaging the provision of finance for any purpose in connection with this Agreement;
- 30.2.4 to any Competent Authority;
- 30.2.5 in the case of the Purchaser to the Mayor of London and/or the Greater London Authority and/or the Secretary of State for Transport;
- 30.2.6 in the case of the Purchaser to any member of the TfL Group;
- 30.2.7 to the extent that the relevant Confidential Information is in the public domain otherwise than by breach of this Agreement;
- 30.2.8 which was made available to the disclosing Party on a non-confidential basis;
- 30.2.9 which is required in connection with a disposition or other transfer of rights permitted in accordance with this Agreement;
- 30.2.10 which is required by law or by order of a Court of a competent jurisdiction (but only to the extent required by such law or order) to be disclosed in connection with any Dispute, litigation or other dispute resolution procedure; or

30.2.11 to any member of the Supplier Group for the purposes of the performance by the Supplier of its obligations under this Agreement.

30.3 Confidentiality Undertaking

Where disclosure is permitted under Clause 30.2, other than Clauses 30.2.1, 30.2.2, 30.2.7 or 30.2.8, the Party disclosing the Confidential Information shall procure that the recipient of the Confidential Information shall be subject to the same obligations of confidentiality as that contained in this Agreement.

30.4 Prior Notice of Disclosure

If a Party becomes required in circumstances contemplated by Clauses 30.2.1 to 30.2.11 to disclose any Confidential Information, such Party shall give to the other Party as much notice as is practical in the circumstances of such disclosure and shall co-operate with the other Parties, having due regard to the other Parties' views, and take such steps as the other Parties may reasonably require in order to enable it to mitigate the effect of, or avoid the requirements for, any such disclosure. Where the disclosing Party giving notice is the Purchaser, it shall only be obliged to give notice to, co-operate with, have due regard to the views of, and take steps as reasonably required by the Supplier.

30.5 Standard of Care

In fulfilling its obligations under this Clause 30, each Party shall be required to use the same degree of care to prevent unauthorised disclosure of such Confidential Information as it would use to prevent the disclosure of its own commercial and financial information of the same or similar nature and which it considers proprietary or confidential.

30.6 Announcements

The Supplier shall not (and shall procure that each Subcontractor and supplier shall not) without the prior written consent of the Purchaser (such consent not to be unreasonably withheld or delayed) advertise or otherwise give any publicity in any form to any matter relating to this Agreement or announce their involvement in the design, manufacture, supply, testing, commissioning, delivery, maintenance or support of any Goods.

30.7 Reputation

The Supplier shall not knowingly do or omit to do anything in relation to this Agreement which may bring the standing or reputation of any other Party into disrepute or otherwise attract adverse publicity in relation to the other Parties.

30.8 Survival

The obligations of the Parties under this Clause 30 shall survive the expiry or the termination of this Agreement for whatever reason.

31. FREEDOM OF INFORMATION

31.1 The Supplier acknowledges that the Purchaser:

31.1.1 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, and

31.1.2 may be obliged under the FOI Legislation to disclose Information without consulting and/or obtaining consent from the Supplier.

- 31.2 Without prejudice to the generality of Clause 31.1, the Supplier agrees and shall procure that its Subcontractors and suppliers (if any) will agree to:
- 31.2.1 transfer to the Purchaser or such other persons as may be notified by the Purchaser to the Supplier each Information Request relevant to this Agreement or any member of the TfL Group that the Supplier or its Subcontractors (if any) (as the case may be) receive as soon as practicable and in any event within three (3) days of receiving such Information Request; and
 - 31.2.2 in relation to Information held by the Supplier on behalf of the Purchaser, provide the Purchaser with details about and/or copies of all such Information that the Purchaser requests and provide such details and/or copies within six (6) days of a request from the Purchaser (or such other period as the Purchaser may reasonably specify), and in such forms as the Purchaser may reasonably specify.
- 31.3 The Purchaser (as may be directed by TfL) shall be responsible for determining whether Information is exempt or excepted information under the FOI Legislation and for determining what Information (if any) will be disclosed in response to an Information Request in accordance with the FOI Legislation. The Supplier shall not himself respond to any person making an Information Request, save to acknowledge receipt, unless expressly authorised to do so in writing by the Purchaser.
- 31.4 The Supplier acknowledges that the Purchaser (as may be directed by TfL) may be obliged under the FOI Legislation to disclose Information without consulting or obtaining consent from the Supplier.

32. **DISPUTE RESOLUTION**

If any Dispute should arise under this Agreement, either Party may refer it for resolution pursuant to Schedule 10 (*Dispute Resolution Procedure*).

33. **PROHIBITED ACTS**

- 33.1 The Supplier shall not and shall use its reasonable endeavours to procure that its Subcontractors (if any) shall not commit any Prohibited Act.
- 33.2 The Purchaser may audit and check any and all such records of the Supplier as are necessary in order to monitor compliance with this Clause 33 at any time during performance of this Agreement and during the three (3) years after the date on which the Fleet Acceptance Certificate has been given.
- 33.3 If the Supplier, any of its shareholders, Subcontractors, or anyone employed by or acting on behalf of the Supplier or any of its agents commits any Prohibited Act, this constitutes a material breach of this Agreement and shall entitle the Purchaser to serve written notice terminating this Agreement in whole or in part with immediate effect. In the event that this Agreement is terminated in accordance with this Clause 33.3, Clauses 25.5 and 25.6 shall apply.
- 33.4 If a Prohibited Act is committed by any Subcontractor or any employee or agent of such Subcontractor or the Supplier then the Purchaser may serve a warning notice upon the Supplier instead of exercising its rights to terminate with immediate effect and unless, within thirty (30) days of receipt of such warning notice, the Supplier removes or procures the removal of the relevant Subcontractor, employee or agent (as the case may be) from further involvement with any aspect of the performance of this Agreement and (if necessary) procures the provision of the affected works and/or services by another

Subcontractor, employee or agent (as the case may be) this constitutes a material breach of this Agreement and entitles the Purchaser to serve written notice terminating this Agreement in whole or in part with immediate effect. In the event that this Agreement is terminated in accordance with this Clause 33.4, Clauses 25.5 and 25.6 shall apply.

34. ASSIGNMENT, TRANSFER AND SUB-CONTRACTING BY THE SUPPLIER

34.1 Subcontracting

34.1.1 The Supplier may sub-contract its obligations under this Agreement either in whole or in part to any Subcontractor provided that:

- (a) the written consent of the Purchaser is obtained by the Supplier prior to the Supplier entering into any Subcontract; and
- (b) The Supplier shall notify the Purchaser in writing of the company name, contact details and details of the legal representatives of any Subcontractor.

34.1.2 Unless the Purchaser otherwise agrees in writing, the Supplier shall procure that each Subcontractor duly executes and delivers to the Purchaser, within fifteen (15) Working Days of the date of the relevant Subcontract, a deed of warranty in the form set out at Schedule 15 (*Form of Subcontractor Warranty*).

34.1.3 The Supplier shall be fully responsible for any act, neglect, default or breach of this Agreement by any Subcontractor or supplier or the directors, agents, representatives or employees of the Supplier or of any of its Subcontractors or suppliers as if such act, neglect, default or breach had been carried out by the Supplier.

34.1.4 The Supplier shall ensure that it includes in any Subcontract provisions substantially similar terms to those set out in Clause 20 (*Payment*).

34.1.5 The Purchaser reserves the right to verify whether there are any grounds for excluding any Subcontractor under Regulation 57 of the Public Contracts Regulations 2015. Where necessary for the purposes of the Purchaser's exercise of its right under this Clause 34.1.5, the Company may request that the information provided by the Supplier under Clause 34.1.1(b) shall be accompanied by one or more European Single Procurement Document(s) within the meaning of Regulation 59 of the Public Contracts Regulation 2015 in respect of the relevant Subcontractor(s). Further, the Purchaser:

- (a) shall require the Supplier to replace any Subcontractor in respect of which the verification has shown that there are compulsory grounds for exclusion under Regulation 57 of the Public Contracts Regulations 2015; and
- (b) may require the Supplier to replace any Subcontractor in respect of which the verification has shown are non-compulsory grounds for exclusion under Regulation 57 of the Public Contracts Regulations 2015.

34.2 Assignment

Without prejudice to Clause 34.1, the Supplier shall not assign (whether absolutely or by way of security and whether in whole or in part), transfer, mortgage, charge, declare itself a trustee for a third party of, or otherwise dispose of (in any manner whatsoever) its rights and/or obligations under this Agreement, and any purported dealing in contravention of this Clause 34 shall be ineffective.

35. **ASSIGNMENT AND NOVATION OR GRANTING OF SECURITY BY THE PURCHASER**

35.1 **Permitted Transfers**

The Purchaser shall be entitled without the consent of the Supplier to assign (whether absolutely or by way of security and whether in whole or in part) transfer, novate, mortgage, charge or otherwise dispose of its rights and/or obligations under this Agreement to any person including for the purposes of financing its obligations under this Agreement.

35.2 **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 to Clause 35.1, the Supplier shall execute such documents and do such other things as the Purchaser may reasonably request in order to facilitate and perfect such dealing.

36. **NOTICES**

36.1 **Form of Communications**

Any notice, approval, consent or other communication referred to in this Agreement:

36.1.1 must be in writing; and

36.1.2 must be left at the address of the addressee or sent by pre-paid first class post (airmail if posted to or from a place outside the United Kingdom) to the address of the addressee or sent by facsimile to the facsimile number of the addressee in each case which is specified in this Clause 36.1 in relation to the Party to whom the notice is addressed, and marked for the attention of the person so specified, or to such other address or facsimile number in England or Wales, and/or marked for the attention of such other person as the relevant Party may from time to time specify by notice given in accordance with this Clause 36.1.

The relevant details of each Party at the date of this Agreement are:

Purchaser: as specified in the Contract Particulars

Supplier: as specified in the Contract Particulars

36.2 Each such communication shall, unless otherwise shown, be deemed to have been received:

36.2.1 if personally delivered, at the time of delivery;

36.2.2 if sent by first class post, on the third Working Day following the date on which it was posted or, if posted to or from a place outside the United Kingdom, the seventh Working Day after posting;

36.2.3 in the case of a facsimile, on production of a transmission report from the machine from which the facsimile was sent which indicates that the facsimile was sent in its entirety to the facsimile number of the recipient; and

36.2.4 in the case of electronic mail, five (5) working hours (where "working hours" are 09:00 to 17:00 in a Working Day) following the time when the sender's electronic mail system dispatches the electronic mail provided that the correct

email addresses as detailed in Clause 36.1 are used. The place of delivery of email will be deemed to be the postal address nominated by the recipient in Clause 36.1.

36.3 Receipt on a Non-Working Day

A notice received or deemed to be received in accordance with Clause 36.1 above on a day which is not a Working Day or after 5.00 p.m. on a Working Day according to local time in the place of receipt, shall be deemed to be received on the next following Working Day.

36.4 Change of Address

Each Party undertakes to notify immediately the other Parties by notice served in accordance with this Clause 36 if the address specified herein is no longer an appropriate address for the service of notice.

36.5 Service of Proceedings

This clause does not apply to the service of any proceedings or other documents in any legal action or, where applicable, any arbitration or other method of dispute resolution.

37. ENTIRE AGREEMENT

37.1 Whole Agreement

Each Party confirms that this Agreement and any other documents referred to in this Agreement 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.

37.2 Non Reliance

Each Party acknowledges and agrees that:

37.2.1 in entering into this Agreement 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 Agreement or any other documents referred to in this Agreement; and

37.2.2 no Party has any other right or remedy in respect of the matters set out in Clause 37.2.1 (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 Agreement) save for any liability for fraudulent misrepresentation or fraudulent misstatement.

38. RIGHTS CUMULATIVE WITH THOSE AT LAW

38.1 Rights Cumulative

Except where expressly stated to the contrary 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.

38.2 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 Agreement 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 Agreement.

39. **FURTHER ASSURANCE**

Each Party to this Agreement 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 Agreement.

40. **SET-OFF**

The Purchaser shall be entitled to withhold from any sum or sums expressed in this Agreement to be payable by it to the Supplier, any amounts due or expressed to be due by the Supplier to the Purchaser. Any payment payable by the Supplier under this Agreement shall be made in full without any set-off or counterclaim howsoever arising and shall be free and clear of, and without deduction of, or withholding for or on account of, any amount which is due and payable to the Supplier under this Agreement.

41. **WAIVER**

The rights and remedies of the Parties shall not be affected by any failure to exercise or delay in exercising any right or remedy or by the giving of any indulgence by the other Party 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. 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.

42. **SEVERANCE**

If any provision or part of this Agreement is void or unenforceable due to the operation of any Applicable Law, it shall be deemed to be deleted and the remaining provisions of this Agreement shall continue in full force and effect.

43. **COSTS**

Each Party shall be responsible for their own costs (including legal costs) in relation to the negotiation and execution of this Agreement.

44. **LANGUAGE**

This Agreement is executed in English and all communications under this Agreement shall be made in English.

45. **CONTRACTS (RIGHTS OF THIRD PARTIES) ACT 1999**

45.1 With the exception of the right of:

45.1.1 any member of the TfL Group;

45.1.2 any person expressly stated to be indemnified by a Party; and

45.1.3 the Installer.

to enforce any term of this Agreement which either expressly or by implication confers any benefit upon such person, no term of this Agreement is enforceable under the

Contracts (Rights of Third Parties) Act 1999 by a person who is not a signatory to this Agreement.

46. **COUNTERPARTS**

This Agreement 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.

47. **GOVERNING LAW AND JURISDICTION**

47.1 **Governing Law**

This Agreement and any non-contractual obligations arising out of or in connection with it shall be governed by, and construed in accordance with, English law.

47.2 **Exclusive Jurisdiction**

Subject to the terms of Clause 32, the English Courts have exclusive jurisdiction in relation to any claim, dispute or difference ("**Proceedings**") concerning this Agreement and any matter arising from it. For these purposes, each Party irrevocably submits to the jurisdiction of the English Courts.

47.3 **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.

48. **RESPONSIBLE PROCUREMENT**

48.1 The Supplier shall have regard to the Responsible Procurement Principles and shall comply at all times with the Responsible Procurement Principles insofar as they are relevant to this Agreement, the Supplier and/or any Subcontractor.

49. **CRIME AND DISORDER**

49.1 The Supplier acknowledges that the Purchaser is under a duty in accordance with Section 17 of the Crime and Disorder Act 1998 to:

49.1.1 have due regard to the impact of crime, disorder and community safety in the exercise of the Purchaser's duties;

49.1.2 where appropriate, identify actions to reduce levels of crime and disorder; and

49.1.3 without prejudice to any other obligation imposed on the Purchaser, exercise his functions with due regard to the likely effect of the exercise of those functions on, and the need to do all that it reasonably can to prevent crime and disorder in its area,

and in the performance of this Agreement the Supplier shall assist and co-operate, and use its reasonable endeavours to procure that its Subcontractors assist and co-operate, with the Purchaser where possible to enable the Purchaser to satisfy its duty.

50. **LONDON LIVING WAGE**

50.1 The Supplier acknowledges and agrees that the Mayor of London, pursuant to section 155 of the GLA Act, has directed the TfL Group (including the Purchaser) to ensure that the

London Living Wage is paid to anyone engaged by the TfL Group who is required to perform contractual obligations in Greater London or on the LUL Network.

50.2 Without prejudice to the generality of Clause 50.1, the Supplier shall and shall procure that its Subcontractors (if any) shall:

50.2.1 ensure that none of its employees engaged in the performance of this Agreement in Greater London or on the LUL Network (but not otherwise) is paid an hourly wage (or equivalent of an hourly wage) less than the London Living Wage;

50.2.2 ensure that none of his employees engaged in the performance of this Agreement is paid less than the amount to which they are entitled in their respective contracts of employment; and

50.2.3 co-operate and provide all reasonable assistance to the Purchaser and any member of the TfL Group in monitoring the effect of the London Living Wage.

51. **DATA TRANSPARENCY**

51.1 The Supplier acknowledges that the Purchaser is subject to the Transparency Commitment. Accordingly, notwithstanding any provisions of this Agreement relating to the FOI Legislation or confidentiality, the Supplier hereby gives its consent for the Purchaser to publish the Contract Information to the general public.

51.2 The Purchaser may in its absolute discretion redact all or part of the Contract Information prior to its publication. In so doing and in its absolute discretion the Purchaser may take account of the exemptions/exceptions that would be available in relation to information requested under the FOI Legislation. The Purchaser may in its absolute discretion consult with the Supplier regarding any redactions to the Contract Information to be published pursuant to Clause 51.1. The Purchaser shall make the final decision regarding publication and/or redaction of the Contract Information.

52. **DATA PROTECTION**

52.1 The Supplier shall at all times comply with the Data Protection Act 1998 (including any subordinate legislation made under that Act from time to time) and any policies issued by the Purchaser from time to time in relation to the processing of data and shall not by any act or fault cause the Purchaser to be in breach of these requirements.

52.2 The Supplier shall:

52.2.1 take appropriate technical and organisational security measures satisfactory to the Purchaser against unauthorised or unlawful Processing of Purchaser Personal Data (as those terms are defined in the Data Protection Act) and against accidental loss, destruction of, or damage to such Personal Data;

52.2.2 provide the Purchaser with such information as it may reasonably require to satisfy itself of compliance by the Supplier with the requirements of this Clause 52; and

52.2.3 cooperate with the Purchaser in complying with requests or enquiries made pursuant to the Data Protection Act.

53. **CONFLICT OF INTEREST**

53.1 The Supplier acknowledges and agrees that it does not have any interest in any matter where there is or is reasonably likely to be a conflict of interest with performing this

Agreement or any member of the TfL Group, save to the extent fully disclosed to and approved in writing by the Purchaser.

53.2 The Supplier shall undertake ongoing and regular conflict of interest checks throughout the duration of this Agreement and in any event not less than once in every six months and shall notify the Purchaser in writing immediately on becoming aware of any actual or potential conflict of interest with performing this Agreement or any member of the TfL Group and work with the Purchaser to do whatever is necessary (including the separation of staff working on and/or data relating to this Agreement from the matter in question) to manage such conflict to the Purchaser's satisfaction and provided that, where the Purchaser is not so satisfied (in its absolute discretion), the Purchaser shall be entitled to serve written notice terminating this Agreement in whole or in part with immediate effect. In the event that this Agreement is terminated in accordance with this Clause 53, Clauses 25.5 and 25.6 shall apply.

54. **CRIMINAL RECORDS DECLARATION**

54.1 The Supplier shall procure from each Relevant Individual (as the case may be) a declaration that he has no Relevant Convictions ("**Declaration**") or disclosure of any Relevant Convictions he has committed. The Supplier shall confirm to the Purchaser in writing on an annual basis upon request that each Relevant Individual has provided a Declaration. The Supplier shall procure that a Relevant Individual notifies the Supplier immediately if he commits a Relevant Conviction throughout the duration of this Agreement and the Supplier shall notify the Purchaser in writing immediately on becoming aware that a Relevant Individual has committed a Relevant Conviction.

54.2 The Supplier shall not engage or allow to act on behalf of the Supplier or any Subcontractor in the performance of any aspect of this Agreement any Relevant Individual who has disclosed a Relevant Conviction.

54.3 The Purchaser may audit and check any and all such records of the Supplier as are necessary in order to monitor compliance with this Clause 54 at any time during performance of this Agreement.

54.4 If the Supplier fails to comply with the requirements under Clause 54.1 and/or 54.2, the Purchaser may, without prejudice to its rights under Clause 54.5, serve notice on the Supplier requiring the Supplier to immediately take such steps as are necessary to ensure that such Relevant Individual has no further involvement with the performance of any aspect of this Agreement unless (in the case of non-compliance with Clause 54.1) within seven (7) days of receipt of the notice the Supplier confirms to the Purchaser that it has procured all of the Declarations required under Clause 54.1.

54.5 A persistent breach of Clause 54.1 and/or 54.2 by the Supplier shall constitute a material breach of this Agreement and shall entitle the Purchaser to serve written notice terminating this Agreement in whole or in part with immediate effect. In the event that this Agreement is terminated in accordance with this Clause 54, Clauses 25.5 and 25.6 shall apply.

54.6 If either Party becomes aware that a Relevant Individual has committed a Relevant Conviction, the Supplier shall take such steps as are necessary to ensure that such Relevant Individual has no further involvement with the performance of any aspect of this Agreement.

54.7 Nothing in this Clause 54 in any way waives, limits or amends any obligation of the Supplier to the Purchaser arising under this Agreement and the Supplier's obligation to

perform this Agreement remains in full force and effect and the Supplier cannot claim any extra costs or time as a result of any actions under this Clause 54.

54.8 The Supplier confirms that, for the duration of this Agreement, its corporate security and personnel processes are sufficient to ensure that no personnel with a Relevant Conviction will carry out any aspect of this Agreement.

55. BEST VALUE

55.1 The Supplier acknowledges that TfL is a best value authority for the purposes of the Local Government Act 1999 and as such TfL and the Purchaser are required to make arrangements to secure continuous improvement in the way they exercise their functions, having regard to a combination of economy, efficiency and effectiveness. The Supplier shall assist the Purchaser (and, where appropriate, TfL) to discharge this duty and agrees to negotiate in good faith any changes to this Agreement in order for the Purchaser (and, where appropriate, TfL) to achieve best value.

56. WORK RELATED ROAD RISK

Definitions

56.1 For the purposes of Clauses 56.2 to 56.10 (inclusive) and Schedule 19 (*Heavy Goods Vehicle Direct Vision Standard*) of this Agreement, the following expressions shall have the following meanings:

- “**Approved Progressive Training**” means an ongoing programme of personal development that uses a combination of theoretical, e-learning, practical and on the job training to ensure Drivers have the knowledge, skills and attitude to operate safely on urban roads and shall include:
- a. Safe Urban Driving (SUD) training to be undertaken every five years; or
 - b. A training course, which in the reasonable opinion of the Purchaser is an acceptable substitute to SUD; and
 - c. One safety related FORS e-learning module to be undertaken every twelve months
- “**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 Van**” 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;
- “**Category N2 Lorry**” means a vehicle designed and constructed for the carriage of goods having a MAM exceeding 3,500 kilograms but not exceeding 12,000 kilograms;
- “**Category N3 Lorry**” means a vehicle designed and constructed for the carriage of goods and having a MAM exceeding 12,000 kilograms
- “**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 Supplier (including an agency or contracted driver), who operates Delivery and

	<p>Servicing Vehicles on behalf of the Supplier while delivering the Goods and Services;</p>
“DVLA”	<p>means Driver and Vehicle Licensing Agency;</p>
“Direct Vision Standard” or “DVS”	<p>means Direct Vision Standard, a performance based assessment and rating tool, as updated from time to time that measures how much direct vision a Driver has from a Category N3 Lorry cab in relation to other road users. Further information can be found at: www.tfl.gov.uk;</p>
“FORS”	<p>means the Fleet Operator Recognition Scheme, which is an accreditation scheme for businesses operating van and lorry fleets. It offers impartial, independent advice and guidance to motivate companies to improve their compliance with relevant laws and their environmental, social and economic performance;</p>
“FORS Standard”	<p>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</p>
“Front Underrun Protection”	<p>means devices that are fitted at the front of Lorries and which comply with EC Directive 2000/40/EEC and the Road Vehicles (Construction and Use) Regulations 1986</p>
“Gold Accreditation”	<p>means the highest level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk</p>
“Lorry”	<p>means a vehicle with an MAM exceeding 3,500 kilograms;</p>
“MAM”	<p>means the maximum authorised mass of a vehicle or trailer including the maximum load that can be carried safely while used on the road;</p>
“Side Underrun Protection”	<p>means devices that are fitted between the front and rear axles of Lorries and which comply with EC Directive 89/297/EEC and the Road Vehicles (Construction and Use) Regulations 1986;</p>
“Silver Accreditation”	<p>means the intermediate level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk</p>
“Van”	<p>means a vehicle with a MAM not exceeding 3,500 kilograms; and</p>
“WRRR Self-certification Report”	<p>shall have the meaning in Clause 56.8.</p>

Fleet Operator Recognition Scheme Accreditation

56.2 Where the Supplier operates Delivery and Servicing Vehicles to provide the Goods and Services, it shall within ninety (90) days of the Commencement Date:

56.2.1 (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

- 56.2.2 (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 Supplier has attained Silver or Gold Accreditation, the maintenance requirements shall be undertaken in accordance with the periods set out in the FORS Standard.

Safety Features on Lorries

- 56.3 The Supplier shall ensure that every Lorry, which it uses to provide the Goods and Services, shall have:
- 56.3.1 Side Underrun Protection fitted at a height not exceeding 550mm from the ground, unless the Supplier can demonstrate to the reasonable satisfaction of the Purchaser that the Lorry will not perform the function for which it was built if the Side Underrun Protection is fitted;
 - 56.3.2 Front Underrun Protection fitted at a height not exceeding 400mm from the ground, unless the Supplier can demonstrate to the reasonable satisfaction of the Purchaser that the Lorry will not perform the function for which it was built if the Front Underrun Protection is fitted;
 - 56.3.3 equipment fitted with an audible means of warning other road users of the Lorry's left manoeuvre;
 - 56.3.4 prominent signage on the Lorry to warn cyclists and other road users of the dangers of the Lorry's near side blind spot and of getting too close to the Lorry; and
 - 56.3.5 front, side and rear blind spots completely eliminated or minimised as far as practical and possible, through the use of direct vision, fully operational indirect vision aids and driver audible alerts.

Direct Vision Standard

- 56.4 Where applicable:
- 56.4.1 the Supplier shall comply with the Direct Vision Standard and Schedule 19 (*Heavy Goods Vehicle Direct Vision Standard*) attached to this Agreement: and
 - 56.4.2 the Supplier shall ensure that:
 - (a) from and including 1 October 2018, all Category N3 Lorries used in the provision of the Goods and Services achieve a minimum of a one (1) star Direct Vision Standard rating;
 - (b) from and including 1 April 2020 all Category N3 Lorries used in the provision of the Goods and Services achieve a minimum of three (3) star Direct Vision Standard rating; and
 - (c) so far as reasonably practicable, the conditions at all sites and locations within the control of the Supplier where:
 - (i) the Goods are being delivered and the Services are being performed, or
 - (ii) in connection with the delivery of the Goods and performance of the Services, any waste is being disposed of or supplies are being delivered to or from,

are appropriate for each Category N2 Lorry and Category N3 Lorry being used in the provision of the Goods and Services. The Supplier shall not incur any costs or make any changes to the site(s) without the prior written consent of the Purchaser.

Driver Licence Checks

- 56.5 Where the Supplier operates Delivery and Servicing Vehicles to provide the Goods and Services the Supplier shall ensure that:
- 56.5.1 it has a system in place to ensure all its Drivers hold a valid driving licence for the category of vehicle that they are tasked to drive, along with recording any endorsements, or restrictions on the Drivers licence; and
 - 56.5.2 each of its Drivers engaged in the provision of the Goods and Services has a driving licence check with the DVLA or such equivalent before that Driver commences delivery of the Goods and Services 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 Supplier's risk scale, provided that the Supplier's risk scale has been approved in writing by the Purchaser within the last twelve (12) months:
 - (a) 0 – 5 points on the driving licence – six monthly checks;
 - (b) 6 – 8 points on the driving licence – quarterly checks; or
 - (c) 9 or more points on the driving licence – monthly checks.

Driver Training

- 56.6 Where the Supplier operates Delivery and Servicing Vehicles to provide the Goods and Services the Supplier shall ensure that each of its Drivers attend Approved Progressive Training throughout the term of this Agreement.

Collision Reporting

- 56.7 Where the Supplier operates Delivery and Servicing Vehicles to provide the Goods and Services, the Supplier shall:
- 56.7.1 ensure that it has a system in place to capture, investigate and analyse road traffic collisions that result in fatalities, injury or damage to vehicles, persons or property and for generating Collision Reports; and
 - 56.7.2 within 15 days of the Commencement Date, provide to the Purchaser a Collision Report. The Supplier shall provide to the Purchaser an updated Collision Report within five (5) Working Days of a written request from the Purchaser at any time.

Self-Certification of Compliance

- 56.8 Where the Supplier operates Delivery and Servicing Vehicles to provide the Goods and Services, within ninety (90) days of the Commencement Date, the Supplier shall make a written report to the Authority detailing its compliance with Clauses 56.2, 56.3, 56.4, 56.5, 56.6 and 56.7 of this Agreement (the “**WRRR Self-certification Report**”). The Supplier shall provide updates of the WRRR Self-certification Report to the Purchaser on each three month anniversary of its submission of the initial WRRR Self-certification Report.

Obligations of the Supplier Regarding Subcontractors

- 56.9 The Supplier shall ensure that those of its Subcontractors who operate Category N2 Lorries, Category N3 Lorries, Vans and/or Car-derived Vans to provide the Goods and Services shall comply with the corresponding provisions of this Agreement:
- 56.9.1 Clause 56.2;
 - 56.9.2 for Category N2 Lorries – Clauses 56.3, 56.5, 56.6, 56.7 and 56.8;
 - 56.9.3 for Category N3 Lorries – Clauses 56.3, 56.4, 56.5, 56.6 and 56.7 and 56.8 and, where applicable, the appropriate provisions of Schedule 19 (*Heavy Goods Vehicle Direct Vision Standard*); and
 - 56.9.4 for Vans and Car-Derived Vans – Clauses 56.6, 56.7 and 56.8

as if those Subcontractors were a party to this Agreement.

Failure to Comply

56.10 Without limiting the effect of any other clause of this Agreement relating to termination, if the Supplier fails to comply with Clauses 56.2, 56.3, 56.4 (where applicable), 56.5, 56.6, 56.7, 56.8 and/or 56.9 and/or Schedule 19 (*Heavy Goods Vehicle Direct Vision Standard*):

56.10.1 the Supplier has committed a material breach of this Agreement; and

56.10.2 the Purchaser may refuse the Supplier, its employees, agents and Delivery and Servicing Vehicles entry onto any property that is owned, occupied or managed by the Purchaser for any purpose (including but not limited to deliveries).

57. ACCESS

57.1 The Purchaser shall give the Supplier access to the parts of the LUL Network required for the performance of this Agreement in accordance with the provisions of this Clause 57.

57.2 Subject to the provisions of this Clause 57, the Purchaser shall use reasonable endeavours to give access to such parts of the LUL Network to the Supplier on the dates and times on which it has stated that it requires such access.

57.3 The Supplier acknowledges that the Purchaser does not guarantee uninterrupted or exclusive possession to any parts of the LUL Network and that its access to some parts of the LUL Network may be limited in accordance with the Agreement.

57.4 Where the Supplier requires access to the LUL Network to carry out its obligations under this Agreement, it shall

57.4.1 apply for access at the earliest available opportunity; and

57.4.2 provide the Purchaser without delay with such additional information as the Purchaser may reasonably require in respect of the Supplier's access request.

57.5 The Purchaser shall confirm access bookings in accordance with this Clause 57.

57.6 The Purchaser does not warrant or guarantee to the Supplier that such access will be granted. If any request for access is rejected, the Purchaser shall advise the Supplier and agree with the Supplier alternative dates for resubmission. The rejection of an access request shall not entitle the Supplier to an extension of time.

57.7 If the Supplier fails to apply for access in accordance with this Clause 57, the Purchaser shall not be liable for any delays or costs arising and the Supplier shall be responsible for any failure to comply with the terms of the Agreement.

57.8 The Supplier shall as soon as practicable, take all steps to avoid, overcome or minimise the cancellation or alteration of approved access.

57.9 If the Supplier fails to use any booked access, for whatever reason, it shall within twenty-four (24) hours report each instance to the Purchaser setting out all details including the part of the Underground Network affected, the duration of any delay and the reasons for the delay or cancellation so far as the Supplier is aware.

57.10 The Supplier shall ensure that all booked access is used efficiently with minimal disruption and disturbance to others or damage to the Underground Network. The Supplier shall make good any such damage at its own cost at the earliest opportunity and to the reasonable satisfaction of the Purchaser.

- 57.11 Prior to returning any part of the LUL Network to the Purchaser at the end of any period of booked access, the Supplier shall clear away and remove all of its facilities, plant, equipment, rubbish and surplus goods and materials and shall leave that part of the LUL Network in a clean and workmanlike condition to the satisfaction of the Purchaser.
- 57.12 Where the Supplier is denied booked access to any part of the LUL Network through no fault of the Supplier having fully complied with the requirements of Clause 57.4, this shall constitute a Permitted Delay Event.

IN WITNESS whereof this Agreement has been executed and unconditionally delivered as a deed the day and year first above written.

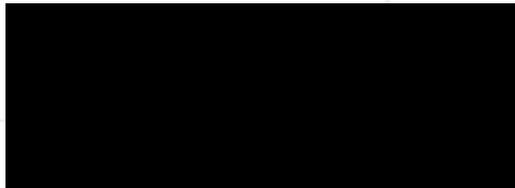
THE COMMON SEAL of
LONDON UNDERGROUND LIMITED

LULU 6216



was affixed to THIS DEED
in the presence of:

Signature of Authorised Signatory



Print name of Authorised Signatory

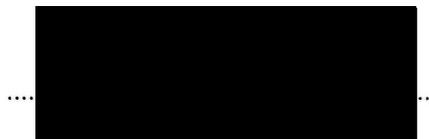


EXECUTED AND DELIVERED AS A DEED

by DELATIM LIMITED

acting by:

Signature of Director



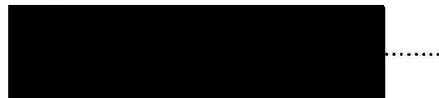
Print name of Director



Signature of Director/Secretary



Print name of Director/Secretary



Issue 2.0	02/06/2017	Document updated for ITT
Issue 3.0	22/01/2018	Document updated for contract award

Summary of Changes

Categories are as follows:

- A - Additional data or information
- C - Correction of requirement
- N - New requirement
- R - Change to requirement
- T - Text or formatting change (no change to requirement)
- D - Requirement deleted

Requirement	Change	Description	Date
TR_042	R	Decision made to have the interface between DTS and CCTV system as ECN. Reference to MVB removed.	15/05/17
TR_571	N	Requirement added to ensure any new maintenance activities are factored into existing Central Line maintenance procedures.	15/05/17
TR_532	R	Reference to EASF-POL-0001 removed as it has been superseded.	17/05/17
TR_572	N	EASF-POL-0001 has been superseded by LU standard S1744.	17/05/17
n/a	A	S1744 added to Referenced Documents.	17/05/17
TR_121	C	Requirement reworded for clarity.	22/05/17
TR_573	N	New requirement added.	23/05/17
n/a	A	Acronym "SDK" added	23/05/17
n/a	A	Acronym "ECN" added	23/05/17
n/a	A	Acronym "TCN" added	23/05/17
TR_299	C	Requirement reworded for clarity.	23/05/17
TR_323	A	Requirement amended to include reference to colours already in use on the train.	23/05/17
TR_324	A	Requirement amended to include reference to colours already in use on the train.	23/05/17

TR_343	A	Reference made to approval by the 'LU engineer'.	23/05/17
TR_346	D	Requirement removed due to duplication with TR_345.	23/05/17
TR_356	D	Requirement incorporated into TR_345.	23/05/17
TR_372	C	Requirement reworded for clarity.	23/05/17
TR_480	A	Example provided for clarity.	23/05/17
n/a	A	Figure 1 updated to reflect decision of ECN as the consist network.	24/05/17
n/a	A	ADC Table updated to include IDs for all ADCs.	24/05/17
TR_077	A	Note added to reference BS EN 62262 for IK rating.	31/05/17
n/a	A	BS EN 62262 added to reference documents.	31/05/17
n/a	A	BS EN 60529 added to reference documents.	31/05/17
TR_212	C	Wording added to cover details of all components along with spares.	31/05/17
TR_327	C	Addition of need for approval from the 'LU engineer'.	31/05/17
TR_161	C	Wording changed from 'VRS storage devices' to 'VRS storage medium'.	23/06/17
TR_121	C	Requirement now refers only to 'VRS storage media'.	23/06/17
TR_574	N	New requirement to define 'SD card' storage capacity.	23/06/17
n/a	A	Environmental Context Document (Central Line) added to reference documents	26/06/17
n/a	R	Referenced document PVEC3131-TR-02-019 has been up-issued to document PVEC3149-LU-RSK-CLI-RP-0020	05/07/17
TR_145	R	EN50132-5-1 superseded by BS EN 62676-1-2	10/07/17
TR_175	R	EN50132-5-1 superseded by BS EN 62676-1-2	10/07/17
TR_176	R	EN50132-5-1 superseded by BS EN 62676-1-2	10/07/17
TR_092	R	Requirement now includes compatibility with existing saloon lighting as well as new LED saloon lighting	26/09/17

TR_168	R	Requirement for 'penetration testing' during post-installation (commissioning) testing removed.	04/10/17
TR_043	R	'CCTV system' reworded to 'VRS' and "car-level ECN" clarified	21/11/17
TR_178	A	Note 3 added	21/11/17
n/a	R	In Sections 14.2.6 and 14.2.7, the review timings have been amended so that the Design Review Submission shall be submitted to the 'purchaser' at least 20 working days prior to the respective review date. (Previously this was 10 working days).	29/11/17
n/a	R	Definition of 'FMDBSAF' amended to remove the words "which prevents a unit from commencing service and being available for service for a period of 24 hours".	04/01/18
n/a	D	In Section 6.5, reference was removed to PIS contract dates as these have changed since version 2.0 of this TRS.	04/01/18
Figure 2	C	Figure 2 updated to reflect current CLIP prototyping plan.	04/01/18
TR_081	C	Wording changed from "web-browser" to "web-server" for clarity.	04/01/18
TR_118	A	Note added	04/01/18
TR_053	A	Reference to defining interface during the design phase added	22/01/18

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1 THIS DOCUMENT

1.1 Purpose

1.1.1 The purpose of this document is to specify the technical requirements for the design, prototyping and supply of a new saloon 'CCTV system' on 92TS (Central Line).

1.2 Terminology

1.2.1 This document is referred to as "this TRS" or "CCTV TRS".

1.2.2 This document will refer to the 1992 Tube Stock sub-fleet that runs on the Central Line as '92TS'.

1.2.3 For clarity, the 1992 Tube Stock sub-fleet that runs on the Waterloo and City Line is not to be fitted with a 'CCTV system' and therefore not considered in this document.

1.3 Document structure and presented information

1.3.1 Assumptions, Dependencies and Caveats (ADCs) and Technical Requirements (TRs) are all assigned IDs. IDs are unique within the group they belong, but not between groups.

1.3.2 Each ID shall be referenced using the prefix: 'ADC_' or 'TR_'.

1.3.3 IDs are presented to the right of the ADC or requirement.

1.3.4 The ID assigned to an ADC or requirement at issue 1.0 will remain unchanged at each subsequent document revision. Where ADCs or requirements are added, they shall be assigned the next available number.

1.3.5 Technical requirements are made up of:

- General requirements, detailed in Section 8
- Interface requirements, detailed in Section 9
- Functional requirements, detailed in Section 10
- Testing and prototyping requirements, detailed in Section 11
- Design principles requirements, detailed in Section 12
- Documentation requirements, detailed in Section 13

1.3.6 Technical requirements or ADCs may include notes to provide additional information to aid understanding but do not form part of the requirement. These are shown using 'Note:'

1.3.7 Appendices containing additional information are also provided:

- Appendix A - Envisaged CCTV system architecture
- Appendix B - 92TS Central Line Fact Sheet

1.3.8 Referenced documents including all standards to be adhered to as well as project specific documents and additional information are also provided and are listed in Section 16.

1.4 Clarifications, contradictions and concessions

- 1.4.1 If there are any contradictions, or other clarifications required, please request from the 'LU Engineer'.
- 1.4.2 If a concession is required against a requirement or any part of the TRS, please contact the 'LU Engineer'. Detailed justification will be required to support a concession request.
- 1.4.3 If required, this TRS will be updated to provide clarification.

2 ACRONYMS AND ABBREVIATIONS

2.1.1 The following acronyms and abbreviations are used in this specification.

Abbreviation	Definition
92TS	The passenger rolling stock that operates on the London Underground Central line. The fleet comprises 85 8-car trains of 2-car units. Cabs are located at either end of the train, but can also be positioned within the middle.
AC	Alternating Current
AGC	Automatic Gain Control
AIDD	Agreed Interface Definition Documents
ALARP	As low as reasonably practicable
API	Application Programming Interface
AVC	Advanced Video Coding
CCTV	Closed Circuit Television
COTS	Commercial Off-The-Shelf
DC	Direct Current
DPA	Data Protection Act
DTUP	Deep Tube Upgrade Project (Previously New Tube for London – NTfL)
ECN	Ethernet Consist Network
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ESAC	Engineering Safety and Assurance Case
fps	Frames per second
GUI	Graphic User Interface
HCI	Human-Computer Interaction
HMI	Human Machine Interface
IRE	Institute of Radio Engineers

ITT	Invitation to Tender
LRU	Line Replaceable Unit
LU	London Underground.
LUL	London Underground Ltd.
MAC address	Media Access Control address
MTS	Mayor's Transport Strategy
OEM	Original Equipment Manufacturer
OIL	Open Issues Log
ONVIF	Open Network Video Interface Forum
PCB	Printed Circuit Board
PIS	Passenger Information System
PoE	Power over Ethernet
PTZ	Pan, Tilt, Zoom
RFI	Radio Frequency Interface
RVAR	Rail Vehicle Accessibility Regulations (2010)
SDK	Software Development Kit
SNR	Signal-to-Noise Ratio
TCN	Train Communication Network

3 DEFINITIONS

3.1.1 Use of the following terms shall be shown throughout the document by enclosing them in single inverted commas. The meaning of these terms are as defined in the following table.

Term	Abbreviation	Definition
AC traction system		The replacement traction system being provided by an LU procured manufacturer. The scope of work is described in Section 6.4.
Approved products register	APR	Register of LU's approved products, located at http://www.lu-apr.co.uk .
Active cab		A cab which has been opened by the 'train operator'. This is achieved by unlocking the cab control panel and moving the Master Control Switch out of the SELECT position.
Acton TMU facility		LU's Railway Engineering Works in Acton, London where rail vehicle modification and overhaul works take place.
Authorised review staff		A dedicated team from Depot Security Staff, suitably trained for gathering 'recorded footage' for evidential purposes in terms of DPA responsibility and data processing competence.
Cable ident		Cable identification, a means of designating cable identification as per designs and drawings.
CCTV camera		Cameras used for closed-circuit television purposes, i.e. a TV system in which signals are not publicly distributed but are monitored, primarily for surveillance and security purposes. In the case of this TRS, 'CCTV cameras' shall be 'IP cameras'.
CCTV download software		Software that allows 'recorded footage' to be downloaded from the 'VRS storage medium' or onto a 'portable PC' via a 'service port.'
CCTV system		'CCTV cameras', 'VRS', 'storage media', 'recorder box', and any other equipment that enables the 'CCTV cameras' to record and store 'recorded footage'.
CCTV system test		A test performed by the 'CCTV system' upon itself when requested, to detect any defects, errors and or missing components. Relevant requirements are in Section 10.12.
Central Line	CLIP	A programme of works across the 92TS fleet which

Improvement Programme		includes the installation of an in-saloon 'CCTV system'.
Communication function		A means of communication provided by the 'replacement PIS' that includes 'talkback'.
Configurable data		Data capable of being configured by the 'purchaser' without any need to interact with the 'supplier'.
Contract		The documents that form the contract for the 'CCTV system', including the Manufacture Supply Agreement (MSA) and the Spares and Support Agreement (SSA).
Control supply		A low voltage direct current supply, supported by the standby battery, providing for the control of utilities and services on a train. This is provided by one static converter on each unit.
Control voltage range		The voltage range over which the control supply can be expected to vary in normal operation, i.e. between -34V and -60V, nominally -52V.
Data log		A record of 'CCTV system' tests and results, fault data, software updates and data downloads held by the 'CCTV system'.
Data Transmission System	DTS	The new train management and monitoring system being installed as part of CLIP
Debouncing software techniques		A software solution to filter the electrical noise associated with transitions of mechanical buttons, switches, relays etc.
Design life		The specified life for which overall functionality of the 'CCTV system' is available as per this TRS. Periodic replacement of 'CCTV system' parts should be considered as part of design life.
Designer		The company procured by LU to conduct the Saloon Design works.
Detect		Functional purpose of a camera to enable the operator to reliably and easily determine whether any target, such as a person, is present; as defined in BS EN 62676-4:2015, Section 6.7.
Emergency duty		When the local motor alternator or static converter is not running, and the power is fed to vital systems from the battery supply. This includes the process of 'loadshed'.

Fixed interfaces		Physical joint between components which is designed to be left undisturbed by maintenance tasks.
Fleet Mean Distance Between Technical Failure	FMDBTF	A measure of reliability that expresses the average distance in service across the fleet before a failure of 119 seconds or less occurs, and does not require the train to be withdrawn from service.
Fleet Mean Distance Between Service Affecting Failure	FMDBSAF	A measure of reliability that expresses the average distance in service across the fleet before a failure which causes a disruption to the train service occurs (i.e. 120 seconds or greater), a train is required to be withdrawn from service.
Hard Disk Drive	HDD	A data storage device that uses magnetic storage to store and retrieve digital information using one or more rigid rapidly rotating disks (platters) coated with magnetic material.
High integrity		An element or system that provides essential services on the rolling stock, and that ensures the rolling stock can be operated safely and reliably both in normal service and during degraded modes or emergencies. Note: Please refer to S1180 3.4.4.5
Identify		Functional purpose of a 'CCTV camera' to enable identification of an individual beyond reasonable doubt; as defined in BS EN 62676-4:2015, Section 6.7.
Internet Protocol camera	IP Camera	A type of digital video camera commonly employed for surveillance that can send and receive data via a computer network and the Internet.
Loadshed		The process where functionality is temporarily shed in order to prolong the operation of vital functions.
London Underground Engineer	LU Engineer	The LU-employed engineer responsible for the delivery of this 'contract'.
Maintenance mode		A mode of train operation accessed only by use of the maintainer's Key switch, SK-M.
Maintenance staff		Persons responsible for maintaining and investigating faults with the asset.
Metadata		The set of data that describes and gives information about 'recorded footage'.
Monitor		Functional purpose of a 'CCTV camera' to enable viewing of the number, direction and speed of

		movement of people across a wide area, providing their presence is known to the operator; as defined in BS EN 62676-4:2015, Section 6.7.
Moveable interfaces		Physical joint between components which is designed to be disturbed at least once during its 'design life'.
Network Video Recorder	NVR	A software program on a dedicated device that records video in a digital format to a 'storage medium'. An NVR contains no dedicated video capture hardware, but receives video from interfacing with 'CCTV cameras'.
Non-blocking		A non-blocking Ethernet switch/ router rated at speed q with n ports shall have a back-plane bandwidth q*n bits/sec.
Observe		Functional purpose of a 'CCTV camera' enabling characteristic details of an individual, such as distinctive clothing to be seen, whilst allowing a view of activity surrounding an incident; as defined in BS EN 62676-4:2015, Section 6.7.
Operational		Descriptive of a train state when: (a) the train is 'powered up' (b) the services and systems are energised (c) there is an 'active cab' (d) the train is in service or travelling to or from service
Passenger Emergency Alarm	PEA	The system by which a 'passenger' can alert the 'train operator' to a potential emergency event.
Passenger Information System	PIS	A system that allows audio and visual communications automatically into the saloon, specifically journey information, and allows audio communication from: a) The 'train operator' to the saloon and other cabs b) The line controller to the saloon and cab
Passengers		Those on the train for the purposes of travel.
Penetration test		A simulated cyber security attack and attempt to uncover security vulnerabilities that might otherwise be discovered by hackers.
Portable PC		Standard portable PC operating a standard operating 'CCTV download software'.
Powered down		Descriptive of a train state when: (a) the train is not in service (b) the traction supply is removed (c) the battery supply is isolated and feeding the tail lights only (d) the driving controls are locked out of use

Powered up		Refers to when a train is in any train state except for 'powered down'. This may include 'shutdown', 'operational', 'emergency duty'.
Purchaser		Used in this TRS to mean London Underground Ltd, or LU.
Recognise		Functional purpose of a 'CCTV camera' to enable the operator to obtain recognition of an individual; as defined in BS EN 62676-4:2015, Section 6.7.
Recorded footage		Video recording taken by the 'CCTV camera' and stored on 'storage media' within the 'CCTV camera' and the 'VRS'.
Recorder box		Hardware that houses the 'VRS' and associated 'storage medium', often referred to as just the recorder.
Reference population		The user population spanning the fifth percentile British female to the 95th percentile British male, as defined by "Peoplesize 2008 Version 2.02".
Replacement DTS		A new 'DTS' being supplied to replace the existing 'DTS'.
Replacement PIS		A new 'PIS' being supplied to replace the existing audio only 'PIS' which is to be integrated by the Saloon Design 'designer'.
Reviewer		A member of depot staff, typically DDMs and engineers, who has signed the DPA and can view and search 'recorded footage' but cannot edit it. 'Reviewers' are not trained to take evidential downloads.
Safety circuit		Vital control circuits whose function is directly associated with the safety of the train and its occupants; e.g. the train continuity circuit, safety brake circuits. Note: Please refer to S1180 3.4.5.5
Saloon loudspeakers		Loudspeakers provided in the saloon for use by the 'replacement PIS' where the intended recipients are the 'passengers'.
Secure Digital card	SD card	An SD card or micro SD card.
Security viewing suite		A dedicated viewing station (PC) accessible only to 'authorised review staff' for review and copying of 'recorded footage' for evidential purposes. This should be password protected and/or be located in a secure cabinet.

Self-test		A test performed by the 'CCTV system' upon itself at a defined time/interval, to detect any defects, errors and or missing components. Relevant requirements are in Section 10.12.
Service Affecting Failure	SAF	A failure which causes a disruption to the train service of 120 seconds or greater, or that requires a train to be withdrawn from service.
Service port		A key/lock protected port for accessing elements of the CCTV system' by physically connecting a 'portable PC' to the port.
Shutdown		Descriptive of train state as per 'operational', but: (a) the driving controls are inoperative (b) the brakes are applied No input from both R-RDY and R-OPN relays (no 'active cab') but static converters are running (the train is powered up).
Solid State Drive	SSD	A storage device that stores digital information on solid-state, flash memory.
Special tools		Tools other than readily available industrial tools, excluding software tools.
Standard format		The acceptable formats 'recorded footage' can be exported as, namely; <ul style="list-style-type: none"> • MP4 (see ISO/IEC 14496-14); • MPEG-A (see ISO/IEC 23000-10); • JPEG Baseline (see ISO/IEC 10918-1 and ITU-T T.81) for still images
Storage media		Any technology (including devices and materials) used to place, keep, and retrieve data, e.g. HDD, SSD, USB flash drive, SD card or other local mass storage device.
Supplier		The company procured by LUL to design and supply the saloon 'CCTV system'
Talkback		The two-way 'communication function' between the 'train operator' and 'passenger(s)' within the car in which a 'PEA' has been operated.
Traction supply		The electricity supply that provides power to operate the trains. The nominal 630V DC electrical supply obtained by the vehicle from the conductor rails via collector shoes, or from a shore supply via the shed receptacle.
Train operator		The person who is operating the train from the train's

		active cab. Often referred to as the “train driver”.
Train radio		LU has its own Terrestrial Trunked Radio (TETRA) system provided by a consortium referred to as "Connect".
Train wires		Circuits that run continuously through all cars of a train formation.
Update		The process of uploading a change to the ‘CCTV system’ including updated ‘CCTV software’ and ‘metadata’.
Upgrade		A step-change to the ‘CCTV system’ to provide additional functionality with: <ul style="list-style-type: none"> • A single software update • No hardware modifications of the ‘CCTV system’ that require major modifications to the train • The addition or replacement of hardware requiring no major modifications to the train
Vestibule		The area in the saloon adjacent to doorways where ‘passengers’ pass through to alight and board the train.
Video Recording System	VRS	A local video recording system that includes an ‘NVR’, a dedicated device on which the ‘NVR’ can function, and a ‘VRS storage medium’. It functions as the brain of the ‘CCTV system’, managing interfaces with ‘CCTV cameras’, power supply from the train, the ‘replacement DTS’ and the ‘replacement PIS’. Refer to Appendix A - Envisaged CCTV system architecture for the envisaged ‘VRS’ architecture.
VRS storage medium		The removable ‘storage medium’ within the ‘recorder box’ onto which ‘video footage’ is recorded by the ‘VRS’. This shall be of the form of an SSD.

4 INTRODUCTION

4.1 Supplier Scope

4.1.1 The scope is to design, prototype and supply a saloon 'CCTV system' for 92TS on the Central Line.

4.1.2 The purpose of these works is to support the MTS goal of improving safety and security for all Londoners, which is aligned specifically with Proposal 79 of the strategy. Saloon CCTV shall also enhance journey quality for 'passengers'.

4.1.3 The supply of the 'CCTV system' includes the:

- manufacture, testing, delivery, and support during installation of prototype systems
- manufacture, routine production testing, delivery, and support during first five (5) production trains of production systems
- delivery of train-the-trainer training to LU trainers

4.1.4 The 'purchaser' will be responsible for the retrofit of the 'CCTV system' including the:

- installation of the 'CCTV system' (including prototype)
- installation testing of the 'CCTV system'
- acceptance for passenger service

4.2 Outputs

4.2.1 The required outputs ensure the 'purchaser' can implement (install, design accept, test, maintain, and operate) the 'CCTV system' to satisfy this TRS. This includes:

- Design documentation as described in Section 15
- supply of the equipment forming the 'CCTV system' for 92TS including prototype systems to prove the design – this includes associated communication cabling and power wiring
- supply of 'CCTV download software' and licences
- supply of any supporting hardware
- spares as stated in the 'contract'
- installation requirements, constraints and bill of materials for fixings and fastenings
- maintenance instructions
- training documentation
- train-the-trainer training

Note: installation instructions will be generated by the Saloon Design 'designer' based on the requirements, constraints and bill of materials provided by the 'supplier'.

6 PROJECT INTERFACES

6.1 General

- 6.1.1 A collaborative approach is required in order to manage the project interfaces and ensure compliance with this TRS.
- 6.1.2 The Saloon CCTV project falls within the wider Central Line Improvement Programme (CLIP) that aims to improve and extend the life of the existing Central Line 92TS fleet of trains.
- 6.1.3 The interfaces between the ‘CCTV system’ and all interfacing systems will be managed through Agreed Interface Definition Documents, owned by the ‘purchaser’. These will record any agreed interface requirements and constraints required by both suppliers to ensure they both can comply with the respective TRSs.

6.2 Saloon Design

- 6.2.1 As part of CLIP, a Saloon Design project is being undertaken by an external (to LU) ‘designer’. The Saloon Design project includes;
- Physical saloon modifications for RVAR compliance, including the addition of wheelchair spaces
 - Physical integration of a ‘replacement PIS’ including wheelchair space PEAs
 - Physical integration of a replacement saloon LED lighting system
- 6.2.2 The Saloon Design ‘designer’ shall also design the physical integration of the ‘CCTV system’ into the saloon.
- 6.2.3 LU have also specified that the Saloon Design ‘designer’ undertakes a feasibility investigation on 92TS into the arrangement of saloon LED lighting, saloon ‘CCTV cameras’ and ‘saloon loudspeakers’. The Saloon Design ‘designer’ will assess the feasibility and the difference in whole life cost of two options:
- Feasibility option 1: install LED lighting within the space envelopes of the existing fluorescent lighting (a central strip in the ceiling), retain the existing locations for ‘saloon loudspeakers’ and install ‘CCTV cameras’ in the best location from the remaining space.
 - Feasibility option 2: relocate the lighting to just above the advert panels (resulting in two strips of lighting), relocate ‘saloon loudspeakers’ to the centre of the ceiling and install ‘CCTV cameras’ in the centre of the ceiling within doorways.
- 6.2.4 This feasibility study will assess how lighting and acoustic performance can be improved and ‘CCTV camera’ location optimised by the relocation, and assess the benefits against the additional cost – this will confirm the space envelopes available for the ‘CCTV system’.
- 6.2.5 It is expected that the results of this feasibility investigation will be available before the contract award of the saloon ‘CCTV system’.
- 6.2.6 The final positioning of ‘CCTV system’ equipment shall be defined collaboratively between the ‘supplier’, ‘designer’, and ‘purchaser’ during the project’s design stages, as per the AIDD.

6.3 Data Transmission System (DTS)

- 6.3.1 A 'replacement DTS' is being provided on 92TS, by an external (to LU) supplier as part of CLIP.
- 6.3.2 Part of the scope of the 'replacement DTS' is to provide 'metadata' for the 'CCTV system'. There is therefore a system interface between the 'CCTV system' and the 'replacement DTS'.
- 6.3.3 The interfaces between the 'replacement DTS' are specified in Section 9.3.
- 6.3.4 The 'CCTV system' will be tested with:
 - a) a simulated 'DTS' capable of replicating the relevant features of the 'replacement DTS' during systems testing
 - b) the 'replacement DTS' during prototyping

6.4 AC Traction

- 6.4.1 This is the replacement of the existing DC traction system with an 'AC traction system', including replacement batteries.
- 6.4.2 There is an interface between the 'AC traction system' and the 'CCTV system' in that the replacement static convertor ('control supply') will power the 'CCTV system'. Power consumption of the 'CCTV system' will have to be within the power consumption requirements as defined in this TRS (as per TR_060).
- 6.4.3 It is considered low risk that the 'CCTV system' will be the cause of any electromagnetic interference (EMI) requiring design change. As such, CCTV 'suppliers' do not need to wait for integrated 'AC traction system' EMC testing to progress with their production design.
- 6.4.4 As the 'AC traction system' has the potential to cause a change to the EMC profile of the train, integration testing with the 'AC traction system' will be required to ensure electromagnetic compatibility. This will be conducted at an LU facility after the 'AC traction system' has been installed and tested and will require a representative from the 'CCTV system' 'supplier' to be present and provide required documentation as per this TRS.

6.5 Passenger Information System

- 6.5.1 The PIS TRS specifies a system that will replace all existing equipment associated with the current audio communications system plus provision of visual displays.
- 6.5.2 The PIS allows a 'passenger' to request a direct communication with the Train Operator after activating a Passenger Emergency Alarm (PEA). This function is called 'talkback' and is a full duplex communication between the cab and the car where the car where the PEA has been activated
- 6.5.3 The 'CCTV system' is required to interface with the 'replacement PIS' in that when a PEA is activated, the 'CCTV system' will record the PEA talkback audio, as specified in Section 9.4.

6.5.4 Prototyping will be conducted at the same time for the ‘CCTV system’ and ‘replacement PIS’, as managed by the Saloon Design ‘designer’. An envisaged prototype plan is presented in Section 6.6.

6.6 Prototyping

6.6.1 The prototyping related interfaces to be managed with the ‘replacement DTS’, ‘AC traction system’, and ‘replacement PIS’ result in an envisaged prototype plan as shown in Figure 2.

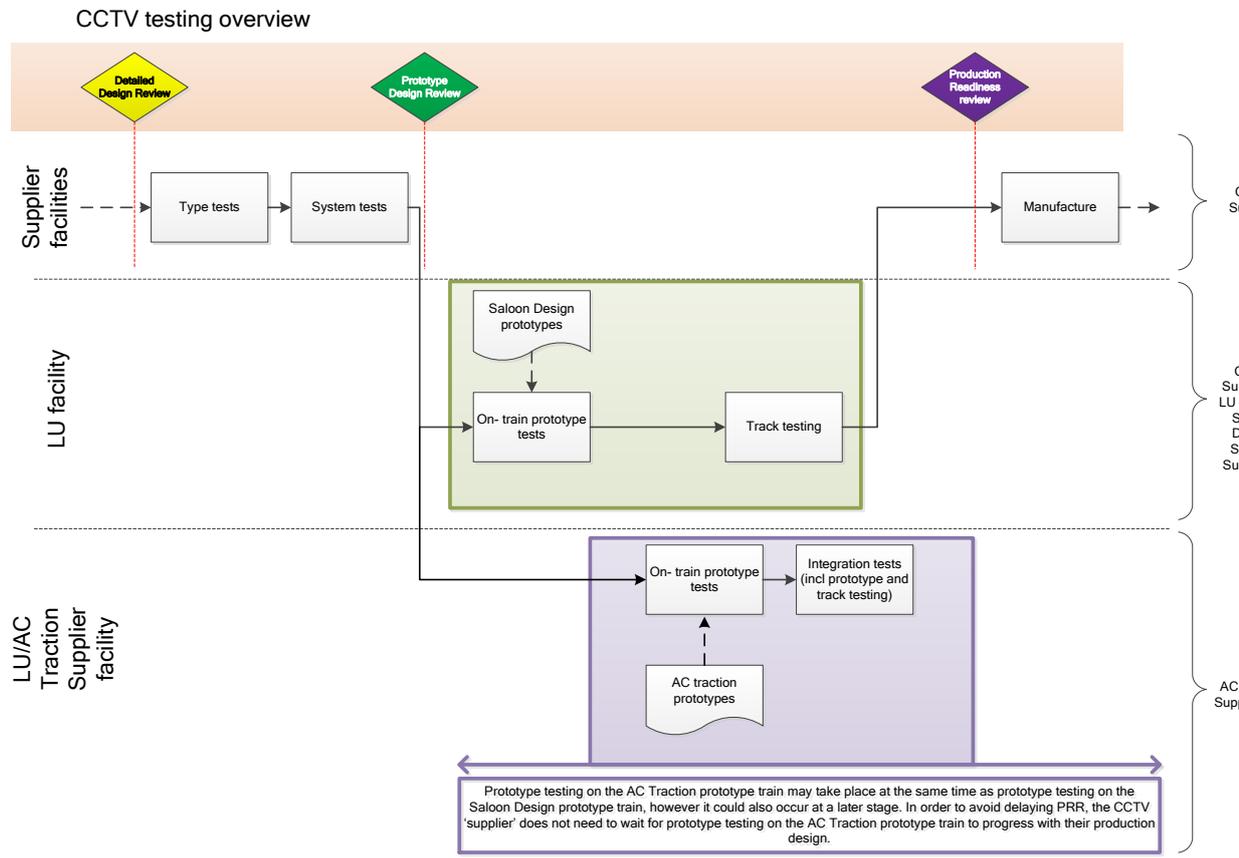


Figure 2 – Envisaged prototype flow chart for 92TS prototyping

6.7 Other interfaces

6.7.1 Other interfaces to consider on 92TS (Central) are the following projects which form the rest of CLIP:

- **Saloon LED Lighting.** This is being designed and installed as part of CLIP, envisaged to be at the same time as the ‘replacement PIS’. Prototyping for saloon LED lighting shall be integrated with the ‘CCTV system’ and ‘replacement PIS’ prototyping.
- **Hainault-Woodford Shuttle.** This is the proposal of providing a 4-car 92TS shuttle service between these stations on the line, allowing more 8-car trains to be available for service on the remainder of the line.

7 ASSUMPTIONS, DEPENDENCIES AND CAVEATS

A, D or C	ADC Description	ADC ID
A	The 'CCTV system' will be installed on trains such that it is not required to operate with the existing 'DTS'.	ADC_001
A	Prototyping and installation will occur with the Saloon Design project.	ADC_002
A	Prototyping will occur at a Central Line Depot or other LU facility.	ADC_003
A	Prototyping will allow the validation of the integration of the 'CCTV system' with the existing train/system/devices and with the 'replacement DTS', 'replacement PIS', and 'AC traction system'.	ADC_004
A	Installation will occur at 'Acton TMU facility' or other LU facility.	ADC_005
D	The Saloon Design 'designer' will dictate the space envelopes available for 'CCTV cameras' and equipment upon completion of their feasibility study.	ADC_006

8 GENERAL REQUIREMENTS

8.1 Output

<i>Requirement</i>	<i>Req. ID</i>
<p>The 'supplier' shall design and supply all 'CCTV system' parts and components, that function as per this TRS, for installation on 85 8-car trains of 92TS, made up of 175 2-car AB units and 165 2-car BC units, to run on the Central line.</p> <p>Note 1: 32 of the C cars are fitted with de-icing equipment and may be denoted C(D) cars. Note 2: Appendix B – 92TS Central Line Fact Sheet provides a description of the 92TS Central Line fleet.</p>	TR_001
<p>The 'supplier' shall design and supply all 'CCTV system' parts and components, that function as per this TRS, to successfully complete the prototype installations on two (2) 92TS 8-car trains.</p> <p>Note 1: The train formation for both trains will be AB-BC-BC-AB Note 2: These can form two (2) of the 85 trains required as part of TR_001 if demonstrated to be fully compliant with this TRS.</p>	TR_002
<p>The 'CCTV system' shall be able to operate as 4-car trains, made up of two 2-car AB units, without presenting the 'train operator' with spurious faults.</p>	TR_003
<p>The outputs shall ensure the 'purchaser' can install and maintain the 'CCTV system' in line with this TRS.</p>	TR_004
<p>The design and operation of the 'CCTV system' shall be compatible with relevant statutory requirements and published guidance particularly in relation to the Data Protection Act 1998 and Human Rights Act 1998.</p>	TR_005
<p>If the 'supplier' is engaged in duties requiring security clearance, they shall conform to requirements set out by LU Network security including compliance with 5-461.</p>	TR_006
<p>For a given system solution, the 'supplier' shall make it known to LU at pre-contract stage if there are IPR / licensing issues that are likely to impact whole-life costs and LU liability.</p>	TR_007
<p>Personnel engaged in the system design, installation, and commissioning/ testing of surveillance and security systems shall be certified competent as possessing the required knowledge and skills to perform their duties.</p>	TR_008
<p>All documentation shall be provided by 'the supplier' in the English language, available in electronic format and capable of being printed on ISO standard A-size paper. Electronic formats shall be readable by COTS software packages.</p>	TR_009

The whole life cost of the ‘CCTV system’, including installation costs, shall be considered throughout the design process. TR_010

The design acceptance process described in Section 14 shall be followed. TR_011

During the design stage, the documentation specified in Section 15 shall be provided as and when required by the Design Acceptance Process. TR_012

Reference images shall be captured for all expected operating conditions (e.g. full lighting, emergency lighting, daylight, etc.) for prototype installation, as well as representative reference images for each camera when installed. TR_013

Reference images shall be stored electronically with high quality printed copies made available to the 'purchaser' for comparison purposes. TR_014

8.2 Scope

Requirement *Req. ID*

The following components shall be included in the ‘CCTV system’: TR_015

- Two (2) 360 degree cameras per saloon to be located in the ceiling in positions as agreed with the 'designer' and the 'purchaser' post Saloon Design feasibility study (see Section 6.2)
- One (1) 'VRS' per car
- One (1) 'SSD' per 'VRS'
- One (1) 'SD card' per camera
- Associated power and data cabling

Note: see Appendix A - Envisaged CCTV system architecture

The ‘supplier’ shall provide all equipment and wiring (including communication and power) up to agreed interfaces to provide a ‘CCTV system’ that functions to this TRS. TR_016

Note: For tender return, the ‘supplier’ shall estimate wiring lengths for their proposed system and provide associated per unit length and per termination cost.

The supplier shall provide 'CCTV download software' to facilitate download of 'recorded footage' onto a PC or portable PC'. TR_017

Note: applicable requirements are detailed in Section 10.6.

The 'CCTV system' shall be an independent, per-car system, i.e. there shall be no intercar recording or video transmission to the cab. TR_018

Note: the 'CCTV system' design shall not require modifications to autocouplers or modifications to or additional intercar jumpers.

The 'supplier' shall provide train-the-trainer training, and associated documentation as per Section 15.27, to LU training staff. TR_019

8.3 Design Approach

<i>Requirement</i>	<i>Req. ID</i>
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The 'CCTV system' shall use COTS equipment as far as reasonably practicable.	TR_020
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The 'supplier' shall minimise the number of unique components required for the 'CCTV system'.	TR_021
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The 'CCTV system' shall be designed to minimise obsolescence issues.	TR_022
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Unless otherwise agreed, the issue of any standard which applies at the date of contract award shall be the version of that standard which is applied.	TR_023
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Note: controlled copies of applicable and agreed LU standards are available via the LU standards portal <https://www.ihs.com/permission/lul-standards/index.html>

For the avoidance of doubt, where standards or specific requirements do not contradict, but parts of one are more onerous than the other, the more onerous parts from each requirement shall be used.	TR_024
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The 'supplier' shall support the 'purchaser' in fulfilling the requirements of S1538.	TR_025
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If direct or indirect changes impact key system functions e.g. selection, alarms, data integrity or control; these shall conform to LU configuration management/ change control procedures as per S1147 3.6.2.	TR_026
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The 'supplier' shall be responsible for checking the validity of documentation or information referenced by this TRS.	TR_027
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Any supporting documentation or information referred to in this TRS is provided for the 'supplier's information and guidance only. The 'purchaser' shall not accept any liability including delays or costs resulting from any information this may contain.	TR_028
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Note: a limited suite of drawings exists for LU rolling stock. The drawings are uncontrolled copies,

supplied by the original equipment manufacturers or the 'purchaser'. It is understood that the rolling stock were built according to these drawings, however, the 'purchaser' cannot offer any guarantees as to the degree of drawing compliance or accuracy which has been achieved. Experience indicates that whilst most information on the drawings appears to be accurate, certain aspects of the rolling stock may differ slightly from that presented in the drawings.

The 'supplier' shall survey the rolling stock to determine, as far as possible, all information required to deliver a 'CCTV system' in accordance with this TRS. TR_029

The 'supplier' shall be responsible for making all necessary enquiries and for obtaining all information required to deliver a 'CCTV system' in accordance with this TRS. TR_030

The 'supplier' shall be responsible for conducting all testing required to prove the design of the 'CCTV system'. TR_031

Note: This does not include mechanical integration installation testing that falls under the remit of the Saloon Design 'designer'.

The design of the 'CCTV system' shall not affect the operations of the railway, including the ability or flexibility of uncoupling and coupling, unit configurations and the train preparation procedure. TR_032

Note: This is with the exception of the 'CCTV system tests' and 'self-tests'.

The 'CCTV system' shall not incorporate any fan-cooled equipment. TR_033

9 INTERFACE REQUIREMENTS

9.1 General

Requirement

Req. ID

The 'supplier' shall collaborate with the 'purchaser' to manage system interfaces (e.g. mechanical, communication, electrical, etc.) between the 'CCTV system' and the train.

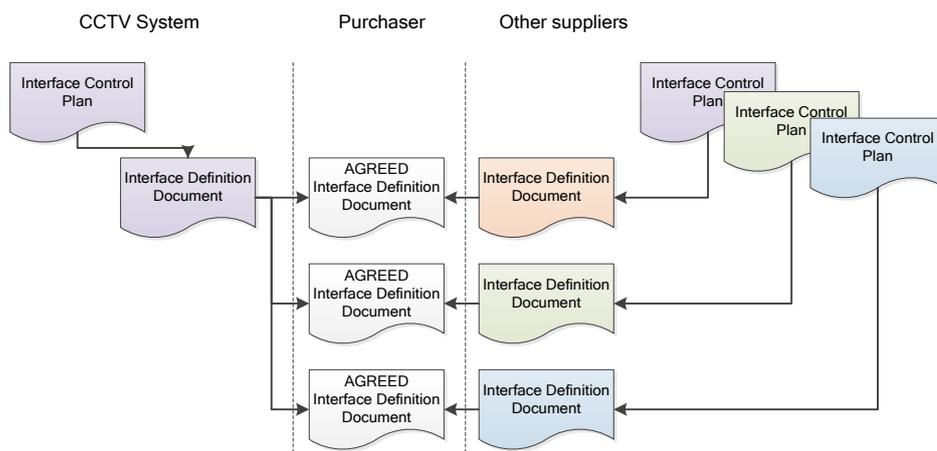
TR_034

Note: this includes interfaces with all retained systems and components and other LU works identified in Section 6.

The 'supplier' shall provide the 'purchaser' with an Interface Definition Document (IDD) covering all the 'CCTV system' interfaces, providing sufficient information to agree the interface with whom it is shared.

Note 1: this includes interfaces with the Saloon Design 'designer' and the manufacturers of the 'replacement PIS', 'replacement DTS' and the 'AC traction system'.

Note 2: these will be used by the 'purchaser' to generate an Agreed Interface Definition Document for each interface, as shown in the figure below.



TR_035

The space envelopes of all 'CCTV system' modules, cabling, conduits and hardware shall be agreed with the 'LU Engineer'.

TR_036

Note 1: this is in collaboration with the Saloon Design 'designer'.

The 'supplier' shall provide the 'purchaser' with all 'CCTV system' installation requirements and constraints.

Note 1: this includes, but is not limited to, requirements and constraints on fixings and fastenings, handling, orientation, cabling installation constraints, etc. TR_037

Note 2: this is to facilitate the Saloon Design 'designer' installation design

The 'CCTV system' shall include at least four configurable 'control supply' derived digital logic inputs per 'VRS'. TR_038

Note: This is to facilitate future signal or other circuit monitoring.

Any data received through the inputs as defined in TR_038 shall have the ability to become future 'metadata' that can appear on 'recorded footage', configurable via the 'CCTV download software'. TR_039

9.2 Saloon Design

Requirement *Req. ID*

The 'supplier' shall continuously collaborate with the 'purchaser' and the Saloon Design 'designer'.

Note: this is to facilitate the 'purchaser' being able to manage the interfaces between the Saloon Design modifications and the 'CCTV system', and assist with, where relevant, compliance with this TRS. TR_040

9.3 DTS

Requirement *Req. ID*

The 'supplier' shall collaborate with the 'purchaser' and the 'replacement DTS' manufacturer.

Note: this is to facilitate the 'purchaser' being able to manage the interfaces between the 'replacement DTS' and the 'CCTV system', and assist with compliance with this TRS. TR_041

The 'CCTV system' shall use Ethernet Consist Network (ECN) in accordance with BS EN 61375-3-4 for data communication with the 'replacement DTS', as agreed with the 'purchaser'. TR_042

The 'VRS' shall have one or two physical interfaces with the 'replacement DTS' to be agreed with the 'purchaser' during the design phase. TR_043

Note: This is to facilitate the possibility of a car-level ECN ring.

The 'CCTV system' shall interface with the 'replacement DTS' as per TR_042 such that a PEA activation indication can be displayed on 'recorded footage'. TR_044

The 'CCTV system' shall interface with the 'replacement DTS' as per TR_042 to send a health status signal to the 'replacement DTS'.

TR_045

Note: The alarm strategy for if/how this is displayed to the 'train operator' in the cab shall be included in the Human Machine Interface (HMI) concept as per Section 15.

Each item of 'CCTV system' equipment shall be able to identify itself to the 'replacement DTS' by providing the following data:

- a) Serial number
- b) Module type (e.g. "camera")
- c) System type (e.g. "CCTV")
- d) Software version (where applicable)
- e) Where there are multiple modules of the same type within a car, the unique position of that module within the car, e.g. A end (see TR_208 and TR_153)

TR_046

The 'CCTV system' shall interface with the 'replacement DTS' such that the 'replacement DTS' is able to identify fault types and faulty 'CCTV system' modules of any car of the train.

TR_047

The 'CCTV system' shall interface with the 'replacement DTS' to obtain date and time.

Note 1: It will be sourced from the ATO via the 'replacement DTS'.

TR_048

Note 2: See Section 10.7

The 'CCTV system' shall interface with the 'replacement DTS' to obtain train location information.

Note 1: It will be sourced from the ATO via the 'replacement DTS'.

TR_049

Note 2: See Section 10.7

9.4 PIS

Requirement

Req. ID

The 'supplier' shall collaborate with the 'purchaser' and the 'replacement PIS' manufacturer.

Note: this is to facilitate the 'purchaser' being able to manage the interfaces between the 'replacement PIS' and the 'CCTV system', and assist with compliance with this TRS.

TR_050

The 'CCTV system' shall interface with the 'replacement PIS' such that PEA 'talkback' audio from that particular car is recorded to the 'VRS storage medium' on that car.

TR_051

PEA ‘talkback’ shall be recorded as per TR_051 from when one PEA is activated in that car until all PEAs in that car are reset. TR_052

The interface between the ‘CCTV system’ and the ‘replacement PIS’ to enable TR_051 shall be agreed with the ‘purchaser’ during the design phase. TR_053

9.5 Power and Protection

<i>Requirement</i>	<i>Req. ID</i>
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The ‘CCTV system’ shall have its power supplied by the ‘control supply’. Note: refer to PVEC3149-LU-RSK-CLI-RP-0020 for an electrical assessment of the 92TS control supply	TR_054
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The ‘CCTV system’ shall include circuit protective devices as part of the ‘CCTV system’ design.	TR_055
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The ‘CCTV system’ shall not require the uprating of any upstream protection devices, e.g. main fuses.	TR_056
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The ‘CCTV system’ shall minimise the need for additional circuit breakers.	TR_057
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The ‘CCTV system’ protection architecture shall ensure diversity to faults within the system, e.g. a fault in one camera in a car shall not result in the loss of all cameras in that car.	TR_058
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Any surge currents associated with the ‘CCTV system’ shall not cause any upstream protection device to activate.	TR_059
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During normal operating conditions, the maximum nominal power consumption of the ‘CCTV system’ equipment in each car shall not exceed 105W.	TR_060
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The ‘CCTV system’ shall ‘loadshed’. Note: See referenced document PVEC3149-LU-RSK-CLI-RP-0020.	TR_061
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10 FUNCTIONAL REQUIREMENTS

10.1 General

<i>Requirement</i>	<i>Req. ID</i>
All surveillance and security hardware and software 'upgrades' shall not cause compatibility or integration conflicts with existing systems or interfaces.	TR_062
For 'upgraded' systems it shall be possible to revert to the last known working system version / configuration without the involvement of the 'CCTV system' supplier.	TR_063
Surveillance and security system hardware and software support shall be agreed with the supplier(s) with a view to ensure optimum performance is maintained and any obsolescence risks are managed throughout the asset lifecycle.	TR_064
All 'CCTV system' software and hardware shall be designed using a modular and structured approach that allows for future 'CCTV system' 'upgrades' and expansion.	TR_065
Should a rack assembly be used, it shall conform to IEC 60297.	TR_066
Digital IP-CCTV products shall be compatible with ONVIF specifications.	TR_067
The design of the 'CCTV system' shall not prevent the 'purchaser' from conducting a future 'upgrade' to the 'CCTV system' to address obsolescence or provide remote download of 'recorded footage'.	TR_068
The 'CCTV system' and 'CCTV download software' shall ensure that any copies of the recorded images are bit-for-bit copies and provide an audit trail confirming this.	TR_069
The 'CCTV system' shall have a 'design life' of 30 years.	
Note: While periodic replacements of 'CCTV system' components (TR_183, TR_200 and TR_201) do not form part of this project, they should be factored into 'design life' for accurate whole life costing.	TR_070
The 'CCTV system' electronic equipment shall comply with BS EN 50155, except where modified by this TRS.	
Note: There are type testing requirements referring to alternative standards in TR_258	TR_071

10.2 Cameras

Note: Where applicable, requirements in this section shall be achieved with the collaboration of the Saloon Design 'designer'.

<i>Requirement</i>	<i>Req. ID</i>
Power for the 'CCTV System' cameras shall be derived from the IEEE 802.3af / IEEE 802.3at connection described in TR_178.	TR_072
Note: This is to reduce the numbers of connections to the train 'Control Supply'.	
'CCTV cameras' shall be installed to ensure field of view(s) are clear of obstructions.	TR_073
Note: This shall be achieved in collaboration with the Saloon Design 'designer'.	
'CCTV camera' enclosures shall minimise internal reflections and be protected from direct sunlight.	TR_074
'CCTV camera' enclosures shall be protected against condensation via a thermostatically controlled internal heater.	TR_075
'CCTV camera' enclosures shall be mechanically secured against environmentally induced movement, e.g. vibration.	TR_076
Any parts of the 'CCTV system' visible to passengers shall meet a rating of IK10 for mechanical impact rating.	TR_077
Note: IK code according to BS EN 62262.	
All 'CCTV system' cameras shall have a camera sensitivity of at least 0.5 lux (colour) for usable video to 50 IRE at f1.2, AGC OFF, based on scene reflectance of 89% and minimum ambient lighting on the train as defined in S1180.	TR_078
Cameras shall automatically and simultaneously adjust shutter speed, iris setting and gain to optimise image exposure and image quality for static / dynamic images.	TR_079
Where fitted, auto-iris lens shall close upon power failure to prevent damage to the imaging sensor.	TR_080
'CCTV cameras' shall incorporate a built-in web-server.	TR_081
'CCTV cameras' shall support unicast and multicast video transmission	TR_082

<p>‘CCTV cameras’ shall support the network protocols:</p> <ul style="list-style-type: none"> • HTTP • HTTPS • SSL • TCP • UDP • ICMP • RTSP • RTP • RTCP • TELNET • IGMPv2/v3 • SMTP • FTP • DHCP client • ARP • DNS • DDNS • NTP • SNMP (MIB-2) • UpnP, iSCSI • IEEE 802.1x 	TR_083
‘CCTV cameras’ shall be able to send/receive alarm signals.	TR_084
‘CCTV cameras shall have I-stream only capability.	TR_085
‘CCTV cameras’ shall support both dynamic and static IP addresses.	TR_086
The ‘CCTV system’ shall have minimum intra frame refresh rate ≥ 1 s.	TR_087
‘CCTV cameras’ shall support programmable privacy masking to mask off one or more areas of a scene where a camera's field of view overlaps LU and private space.	TR_088
The ‘CCTV system’ shall not use pan-tilt-zoom (PTZ) cameras.	TR_089
‘CCTV system’ equipment which is visible to the saloon and cab environment (not hidden behind car interior panelling) shall be resistant to unauthorised removal, vandalism and tampering.	TR_090
If the ‘CCTV system’ cameras require an enclosure, the window shall allow for easy cleaning and easy replacement.	TR_091

Cameras shall be optimised to function correctly with the train's existing fluorescent saloon lighting system and the replacement saloon LED lighting system.	TR_092
The 'CCTV system' camera focus rings or controls shall be capable of locking to mitigate the risk of movement resulting from vibration.	TR_093
The 'CCTV system' cameras shall allow a user to 'observe' 90% of the volume of space within the car.	TR_094
The 'CCTV system' cameras shall allow a user to 'identify' person(s)/object(s); <ul style="list-style-type: none"> • in the car 'vestibule' areas; • at all PEAs 	TR_095
The 'CCTV system' cameras shall allow a user to 'recognise' person(s)/object(s) in the area of the internal cab doors, called "J" doors.	TR_096
'CCTV cameras' shall have the capability of recording to 'SD cards' located within the camera.	TR_097
'SD cards' housed in 'CCTV cameras' shall be protected physically from removal by unauthorised personnel.	TR_098
'Recorded footage' on 'SD cards' housed in 'CCTV cameras' shall have a level of protection so as it cannot be viewed by unauthorised personnel.	TR_099

10.3 Image protection

<i>Requirement</i>	<i>Req. ID</i>
'CCTV camera' video outputs shall not be encrypted.	TR_100
'CCTV system' 'recorded footage' shall be protected from single point failures.	TR_101
'CCTV system' 'recorded footage' shall be protected from unauthorised access.	TR_102

10.4 Video recording system (VRS)

<i>Requirement</i>	<i>Req. ID</i>
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Where recorded, the 'VRS' shall synchronise video recordings with the associated audio, which in turn shall be compressed using the G.711.0 standard.	TR_103
Note: Refer to Section 10.9 (TR_171 and TR_172) for video compression requirements.	
'VRS storage medium' and 'SD cards' shall be designed for 24/7, 365 day operation.	TR_104
'Recorded footage' shall be tamper proof.	TR_105
'Recorded footage' shall provide full authentication and integrity checks for evidential purposes.	TR_106
'Recorded footage' shall not be adversely affected by local or remote monitoring, video retrieval or archiving operations.	TR_107
The 'VRS' shall be fault tolerant and protect against single point failure of the video management software, and 'storage media'.	TR_108
The 'CCTV system' 'VRS' shall monitor the 'CCTV camera' inputs for video loss.	TR_109
The 'CCTV system' 'VRS' shall use an SSD as the 'VRS storage medium'.	TR_110
The 'VRS' shall be hidden from view within the saloon above the solebar. Note: Exact location shall be defined by the Saloon Design 'designer' and agreed with the 'purchaser'	TR_111
The operable lifespan of the 'VRS' and its constituent parts shall be considered, along with cost to calculate a whole life cost.	TR_112
There shall be at least one 'service port' per 'VRS'.	TR_113
'Service port(s)' shall not be directly connected to the 'VRS' and shall form part of a cable loom such that; <ul style="list-style-type: none"> a) the impact the repeated connection and disconnection has on 'CCTV system' reliability is reduced, b) it facilitates the 'service port' to be in an ergonomically advantageous position, c) it is able to be serviced and replaced by 'maintenance staff'. 	TR_114
Note: See Appendix A - Envisaged CCTV system architecture	

The 'VRS storage medium' interface with the 'VRS' shall be designed such that it can be replaced without total replacement of the 'VRS'.

TR_115

Note: This is to reduce maintenance cost when the 'VRS storage medium' connector has exceeded its specified maximum number of mating cycles.

The 'VRS storage medium' shall be removable from the train by a person wearing standard welder's gauntlets.

TR_116

10.5 Image capture

Requirement

Req. ID

The 'CCTV system' shall record at 16 fps.

TR_117

The 'CCTV system' shall be operable according to this TRS for all lighting conditions possible on the train as defined in S1180 (Cl. 3.12.2.2 and Cl. 3.12.2.4), excluding pitch black (in a tunnel with no operational rolling stock lighting).

TR_118

Note: If proposed 'CCTV cameras' have the ability to record in pitch black conditions as standard, this functionality should not be turned off for this project as although it is not a requirement, it would be beneficial in a disaster situation.

The 'CCTV system' shall not allow a 'blind spot' exceeding the space occupied by a single seated or standing passenger from the 'reference population'.

TR_119

The 'CCTV system' shall have dual recording to both 'VRS storage medium' and 'SD cards' housed in 'CCTV cameras'.

TR_120

Note: This is to protect against loss of 'recorded footage' should one 'storage medium' become damaged.

The 'VRS storage medium' shall be capable of storing at least 7 service days of 'recorded footage'.

TR_121

'SD cards' located within cameras shall be capable of storing at least 4 service hours of 'recorded footage'.

TR_574

10.6 Software

Requirement

Req. ID

The 'supplier' shall provide 25 'CCTV download software' licences to be distributed at the 'purchaser's' discretion.	TR_122
'Recorded footage' shall be made using (non-proprietary) industry standard formats unless otherwise agreed with the 'purchaser'.	TR_123
The 'CCTV download software' shall incorporate de-warping software to remove image distortion from 360 degree camera 'recorded footage'.	TR_124
The 'CCTV download software' shall allow still frames to be extracted from the 'CCTV system' 'recorded footage'.	TR_125
The 'CCTV download software' shall include a search facility that enables review of 'recorded footage' and filtering using 'metadata'.	TR_126
The 'CCTV download software' shall preserve 'recorded footage' in its originally recorded format and not process or compress it.	TR_127
The 'CCTV download software' shall have variable speed control, including real time play, stop, pause, fast forward, rewind, and frame-by-frame forward and reverse viewing.	TR_128
The 'CCTV download software' shall display single and multiple cameras and maintain aspect ratio, i.e. the same relative height and width.	TR_129
The 'CCTV download software' shall display a single camera at the maximum recorded resolution.	TR_130
The 'CCTV download software' shall zoom the individual camera view.	TR_131
The 'CCTV download software' shall allow replay of associated audio and other metadata (where applicable).	TR_132
The 'CCTV download software' shall be able to export 'recorded footage' in a 'standard format' at an equivalent quality to the original and still displaying time and date information with no significant increase in file size.	TR_133
Note: This should be viewable via COTS codecs and operating systems in accordance with ISO 22311.	

The 'CCTV download software' shall allow for time synchronized multi-screen replay.	TR_134
The 'CCTV download software' shall allow for time synchronized switching between cameras upon replay.	TR_135
The 'CCTV download software' licenses shall be able to be redeployed by the 'purchaser' at their discretion, without the involvement of the 'supplier'.	TR_136
When reviewing 'recorded footage', an authentication watermark shall be visible on all 'recorded footage'.	TR_137
The 'CCTV download software' shall be provided in a form that allows unlimited instances of the software to be run on multiple machines at the same time.	TR_138
The 'CCTV download software' shall be protected, only for use by 'authorised review staff'.	TR_139
The 'CCTV download software' shall be compatible with Windows 7 and later operating systems.	TR_140
<p>The 'CCTV system' shall be configurable by the purchaser via the 'CCTV download software'. The following are examples of the level of configurability required by the 'purchaser', which shall be agreed with the 'supplier'.</p> <p>General:</p> <ul style="list-style-type: none"> • User profiles • User access/authorisation level • Language • 'CCTV camera' IP address • Date and time settings • Video stream time and frame rate • Metadata <p>Video/Image:</p> <ul style="list-style-type: none"> • Image appearance; <ul style="list-style-type: none"> - Resolution - Compression - Image rotation/orientation - Colour level - Brightness - Sharpness • Overlay <ul style="list-style-type: none"> - Content of overlay including what metadata fields to "show"/"hide" - Position of overlay 	TR_141
The 'supplier' shall provide an SDK for API development, GUI/equipment interface development, and integration of sub-systems/cameras.	TR_573

10.7 Metadata

<i>Requirement</i>	<i>Req. ID</i>
All alarms/ events, 'video footage' and audio streams (where required) shall display the date and time as received from the DTS (TR_048), including a time zone.	TR_142
The time 'metadata' shall use the twenty-four hour clock notation in the form HH:MM, and should include the measure of time: UTC, GMT, BST, whichever is applicable.	TR_143
The 'CCTV download software' shall allow the 'purchaser' to modify or generate 'metadata' to be included in 'recorded footage' as part of the 'CCTV system' configurability.	TR_144
Metadata generation and structures shall be based on common industry standards where practicable including the following (as required /applicable); <ul style="list-style-type: none">i. ISO/IEC 15938-1 (MPEG 7)ii. ISO/IEC 15938-3iii. ISO/IEC 21000-21 (MPEG 21)iv. RFC 5013 (Dublin Core Metadata element set)v. BS EN 62676-1-2: 2014	TR_145
The 'CCTV system' shall include the following 'metadata' with each image: <ul style="list-style-type: none">a) date, of image recordedb) time, of image recordedc) car number, of which the image was recorded ind) location of car within the train, of which the image was recorded ine) train number, programmed in by the train operatorf) location of the train, at the time of image recordedg) unique camera ID, of camera that recorded the imageh) camera number/location, within that cari) an identifier showing if a PEA is activated in that carj) codec name and profilek) video frame rate (fps)l) video resolution <p>Note: (a) - (f) is information received from the 'replacement DTS'</p>	TR_146
The location of the train on the line shall show either the station the train is berthed at or the stations the train is between (e.g. "Bond Street" or "Bond Street - Oxford Circus").	TR_147
Any 'metadata' stored shall be parsed into a meaningful format as to allow for the indexing and searchability.	TR_148
The 'CCTV system' shall incorporate the 'metadata' into 'recorded footage' at the 'CCTV camera'.	TR_149

The 'CCTV system' 'metadata' shall be clearly visible and legible and shall not cover any part of the 'recorded footage'. TR_150

The 'CCTV system' shall record where any 'metadata' has executed a function. TR_151
Note: for example, where the PEA activation has increased the frame rate.

The date 'metadata' shall be in the form of DD/MM/YYYY (or DD/MM/YY is permitted where space is limited). TR_152

All 'CCTV system' cameras shall have a location ID made up of the car number and the location within that car: TR_153

- Car number shall take the form of: 91xxx, 92xxx or 93xxx
- Location within that car shall take the form of: A or D with the A end of the car housing the A camera and vice versa.

The 'CCTV system' shall use blank spaces to separate each field of 'metadata'. TR_154

Abbreviations may be used to reduce space and shall be agreed with the 'LU Engineer'. TR_155

The 'CCTV system' cameras' unique camera ID shall be no less than a 5 digit number. TR_156

All metadata transmission shall be classified as "Process Data" and comply with BS EN 61375-1. TR_157

10.8 Image retrieval

Requirement *Req. ID*

The 'CCTV system' shall allow removal of the 'VRS storage medium'. TR_158

'Recorded footage' from the 'CCTV system' shall be retrievable without any special training. TR_159

'Recorded footage' shall be able to be downloaded onto a 'portable PC' via a 'service port' to be viewed on a web interface for maintenance and non-evidential reviewing activities. TR_160

'Recorded footage' on the removed 'VRS storage medium' shall be retrievable using 'CCTV download software'. TR_161
