VICTORIA LINE UPGRADE 2

SIGNALLING SYSTEM MODIFICATIONS

SECTION 5

WORKS INFORMATION

CONTENTS

For the purposes of this contract, words and expressions defined in the Conditions of Contract except where expressly stated otherwise in this document or the context otherwise requires, have the same meanings when used in this document and all references to Sections and Appendices are references to sections of and Appendices to this document. The following words and expressions have the meanings given to them below:

Access	means access to the London Underground network.
Assurance	means the process of ensuring and providing evidence that the Works have been designed and constructed in compliance with the Employer's Requirements.
ALARP	means "as low as reasonably practicable".
Contractor Records	means records that the *Contractor* is required to retain and maintain.
Design Authority	means the party responsible for safety integrity of the VLU2 Project as defined in CENELEC standard EN50129.
Design Phase	means the period in which the detailed design for the *works* is being prepared and finalised and where any implementation of the detailed design has yet to commence.
Deliverable Records	means records that the *Contractor* is required to supply to the *Project Manager* and which are retained by the *Project Manager* or subsequently provided to the *Employer* or Others.
Employer's Requirements	means the Conceptual Design Statements for Work Packages 1, 2, 4, 5, 7 and 8.
Energy Efficiency	means mitigating the power consumption increase caused by increased train frequency and performance meaning zero increase in energy consumption.
Implementation Phase	means the period following the issue by the *Project Manager* of his acceptance of the *Contractor's* design submission for each Work Package and until the date of Completion Certificate for the whole of the *works* as certified by the *Project Manager*.
In Service Condition	means the condition of the part of the Site or part thereof prior to the start of the *works*.
MTBF	means Mean Time Between Failure, in respect of a repairable item, the mean number of life units during which all parts of the item performed within their specified limits, during a particular measurement interval under stated conditions
Standards	means the standards referred to in Appendix 8 or otherwise agreed and other mandatory British and International standards.
WP	means Work Package as further defined herein.
WTT	means the *Employer's* Working Timetable.
WTT40	means the Employer's Working Timetable at 36 trains per hour for 90 minutes in the a.m. and p.m. peaks.
WTT41	Means the Employer's Working Timetable at 36 trains per hour for 180 minutes in the a.m. and p.m. peaks.
VLU2 Project	means Victoria Line Upgrade 2 Project, the signalling modifications to the existing DTG-R system in the Victoria Line required by the *Employer* under the World Class Capacity Programme for the improvement of train service frequency on the Victoria Line
VLU2 Deliverables	means those deliverables that the *Contractor* is required to provide pursuant to or in connection with the VLU2 Project.
Work Package	means the arrangement of the Conceptual Design Statements as set out at paragraph 1.3

Abbreviation	Definition
09TS	2009 Tube Stock
ac	Alternating Current
AMS	After Market Support
APR	Absolute Position Reference
ARS	Automatic Route Setting
ATO	Automatic Train Operation
ATP	Automatic Train Protection
ATR	Automatic Train Regulation
AWC	Authority to Work Certificate
BLR	Blackhorse Road
BRI	Brixton
CCM	Contractual Communication Management
CDM	Construction Design and Management
CDS	Conceptual Design Statement
CENELEC	European Committee Of Electrical Standardization
DLM	Design Liaison Manager
DMS	Data Warehouse – Data Management System
DTG-R	Distance To Go Radio
EE	Energy Efficiency
EMC	Electro-Magnetic Compatibility
FAT	Factory Acceptance Testing
GLA	Greater London Authority
HF	Human Factors
HSE	Health and Safety Executive
IBJ	Insulated Block Joint
IRI	Inter Station Run Interval
ISO	International Organization of Standardization
ITP	Inspection and Test Plan
KWh	Kilo Watt Hours
LSC	Local Site Computer
LU	London Underground
LUL	London Underground Limited
MACs	Minimum Acceptable Conditions (Rolling Stock)
NOP	Northumberland Park
NPD	Northumberland Park Depot
NR	Network Rail
ORR	Office of Rail and Road
OWS	Operators Work Station
PD	Position Detector
POM	Permitted Overspeed Margin
PPE	Personal Protective Equipment
PQP	Project Quality Plan
QMS	Quality Management System
QUENSH	Quality, Environment, Safety and Health
RAMS	Reliability, Availability, Maintainability and Safety
ROGS	Railways and Other Guided Transport Systems (Safety) Regulations
RORI	Run Out Run In
SCS	Service Control System
SER	Signalling Equipment Room
SRA	Siemens Rail Automation (Holdings) Limited
SSRP	Signalling Safety Review Panel
STO	Stockwell
TCI	Track Circuit Interrupters
TfL	Transport for London
TLL	Tube Lines Ltd
tph	Trains Per Hour
UTX	Under Track Crossing
WAC	Walthamstow Central

WESTRACE	Westinghouse Train Radio Advanced Control Equipment
WTR	Wall Termination Rack

1 DESCRIPTION OF THE WORKS

1.1 This section of the Works Information defines the scope of the *works* to be provided by the *Contractor* in relation to the detailed design scope set out in Work Packages 1, 2, 4, 5, 7 and 8. **REDACTED**

REDACTED

Separately, the Parties agree that the Conceptual Design Statements will be updated by the Employer within 6 weeks of the Contract Date so as to incorporate the technical amendments set out in Works information, Section 7 (Additional Information) hereto.

For the avoidance of doubt, any/all such updates shall be captured as compensation events provided that the Contractor shall not be entitled to any changes to the Prices or Completion Date in connection with any such compensation events.

REDACTED

1.2 The Works Information consists of this document and the Conceptual Design Statements referred to in Appendix 6.

1.3 The Conceptual Design Statements are organised in Work Packages as follows:

- Work Package 1 – Signalling Mainline *****
- Work Package 2 – Northumberland Park – Replacement of Incompatible Legacy Assets
- Work Package 4 – Changes to the Victoria Line Train Borne Signalling Assets
- Work Package 5 – Service Control System upgrades
- Work Package 7 – Service Control System Enabling works.
- Work Package 8 – Termini turnaround improvements & Coasting / Cruising enhancements

*** Work Package 1 includes part of the former Work Package 6 scope (hence omitted).**

1.3A **REDACTED**

1.4 The *works* to be undertaken by the *Contractor* comprise;

- Design Phase: completion of detailed design, and
- Implementation Phase: as set out in the Work Packages referred to in Section 1.3 of this Works Information and in conformity with the Conceptual Design Statements referred to in Appendix 6.

1.5 The *Contractor* attends workshops as necessary during the course of the Design Phase for the *works* as detailed in the *Contractor's* design assurance plan.

1.6 The *Contractor* provides the prices for preparing and completing the *works* comprising the Design Phase and the Implementation Phase in sufficient detail and aligned with the programme to enable consistent and reliable cost and schedule monitoring for valuation and reporting purposes.

1.7 Not used.

1.8 **REDACTED**

2 SITE ACCESS FOR SURVEYS AND TESTS

2.1 Access Arrangements

(1) To facilitate the *Contractor* in undertaking his surveys, correlation visits and other such measurements or investigations to or on LUL premises during the course of the *works*, the *Employer* arranges Access on behalf of the *Contractor* in accordance with the procedure set out in *"WI 1600 – Access Charter"* referred to in Appendix 4. The *Contractor* provides notice to the *Employer* of his requirements by means of the programme on the provision that he observes the strict timescales for booking Access and closures set out in WI 1600, and that he includes in his notice the additional time required by the *Employer* to process the Access and/or Closure (minimum 2 weeks per Access).

(2) The *Contractor* ensures that in carrying out any tests or surveys requiring intrusive *works* of any kind, the *Contractor* returns the existing installation to its state prior to the survey or test, namely back to 'In Service Condition' and ensures that any such *works* are undertaken in strict adherence to LU codes and procedures.

(3) The *Contractor* provides full details of any test or survey to be undertaken which, as a minimum, comprises the methodologies, risk assessments and deliverables.

(4) The *Employer* is responsible for providing proper and correct notification in accordance with the LU Access Charter (see Appendix 4) and enabling the correct planning and procurement of resource in Operators, Maintainers, Protection and other attendance including engineering staff.

2.2 Test Trains

(1) Provision of Test Trains for the Design Phase and Implementation Phase including the timing, quantity and duration thereof are as stated in Appendix 4 and Appendix 11. The *Contractor* identifies any additional requirements and provides notice to the *Project Manager* to enable compliance with the requirements of *"*WI 1600 – Access Charter*"* referred to in Appendix 4.

2.3 Attendances

(1) Within 2 weeks of the *starting date* the *Contractor* advises the *Project Manager* of any attendances, temporary works, storage, protection, accommodation, welfare, security, preliminaries or other assistance he reasonably requires to be provided by the *Employer*.

(2) Subject to Sections 2.1(1), 2.2(1) and 2.3(1), the *Employer* provides free of charge to the *Contractor* all Access, Test Trains, attendances, temporary works, storage, protection and protection staff, gauging engineers, abseilers, access controllers and other requisite preliminaries in connection with the carrying out and completion of the *works* in accordance with the Accepted Programme. This includes four competent, unlicensed staff to assist the Contractor with fleet upgrades. The Employer will provide a Signalling Technical Officer for the Over and Back Testing and Commissioning of Depot Card track circuits. Test and Commissioning Manager to issue AWCs.

(3) The *Employer* provides free of charge, 24 hour access, desk space for four *Contractor's* engineers and Connect radios at Northumberland Park Depot (NPD). The *Contractor* may also utilise the *Employer's* existing storage facilities at NPD. The *Employer* provides Wi-Fi and lockable storage for laptops, records and documentation and a printer for the above *Contractor's* staff.

(4) Not used.

3 DESIGN PHASE

3.1 Design Responsibility

(1) **REDACTED**

(2) The *Employer* has stated the *Employer's* Requirements for the *works* as set out in Work Packages, which it believes will contribute to a capability to increase the current Victoria Line service frequency level. The *Contractor* completes the detailed design for such *works* and/or requirements in order to enable implementation.

(3) As the Design Authority the *Contractor* is responsible for the safety integrity of the design solution

(4) The *Employer* acknowledges and accepts that the *Contractor* has no liability for achievement or failure to achieve the capability to increase the Victoria Line service frequency level.

(5) The *Contractor* warrants that any new Plant or Materials incorporated into the *works* is free from Defects.

3.2 Design Principles

(1) The *Contractor* prepares and submits details of his signalling designs to the *Project Manager* for his acceptance. The *Project Manager* uses appropriately skilled signalling design staff to validate the designs for his acceptance. No signalling changes are undertaken without support from site surveys to verify that the changes are possible. This sets out the principles of the signalling modification in accordance with LU Standard S1195 'Signalling – Functional Requirements'.

(2) 'Red Inks' are produced using the Signalling Design Office modification and drawing control methods as are defined in the standard 'PPP-STCS-ENG-MN00010 – Application Manual Overview'.

(3) Identification and management of safety risks are managed in accordance with best practice and demonstrated to be reduced to ALARP levels by the Design Review Process as prescribed in LU Standard S1197 'Signalling and Signalling Control – Design and Implementation' and via equipment approvals (as required) by the Signalling Safety Review Panel (SSRP).

(4) A Design Log and Signalling Design Specification is produced for the signalling design. A Design Log includes a 'Design Brief' section to specify the scope and aims of a design and is signed-off by the responsible engineer. The Design Log is subsequently used to capture Checker's and Approver's comments and ensure that they are progressed to a satisfactory close-out and accepted by the *Project Manager*.

(5) Not used.

(6) All design is in accordance with applicable standards, especially LU Engineering Standards as specified in Appendix 8. Any design that is not compliant with these LU Engineering Standards is subject to the *Contractor* applying for concessions.

3.3 Design Generally

(1) The *Contractor* provides Assurance that the detailed design of the *works* is in accordance with the Works Information.

(2) At appropriate stages in the Design Phase the *Contractor* provides supporting documentation including human factor assessments where applicable and data to enable the *Employer* to issue the 'Consent to Install' certification for the *works.*

(3) In preparing the design for the *works* the *Contractor* uses existing information and data made available by the *Employer*.

(4) The *Contractor* complies with the Designer's duties under the Construction (Design and Management) Regulations 2015 (CDM Regulations 2015).

(5) The *Employer* is the Client, Principal Contractor and Principal Designer under the CDM Regulations 2015.

(6) The *Contractor* appoints a design manager (the "*Contractor*'s Design Manager") who is responsible for the management, coordination, quality control and Assurance of the design work. The *Contractor*'s Design Manager is the primary interface with the *Project Manager* on design matters.

(7) The *Contractor* appoints qualified checkers to check designs in accordance with Assurance requirements and the Standards.

(8) The *Project Manager* appoints a design liaison manager (the "Design Liaison Manager") who is responsible for liaising with the *Contractor* at all stages during the preparation of the *Contractor*'s design for the *works*.

3.4 Design Checks and Acceptance

(1) The *Contractor* submits details of his design for the *works* and associated Plant and Materials to the *Project Manager* for acceptance. A reason for not accepting the *Contractor*'s design is :

- it does not comply with the *Works Information* or any other part of the contract;
- it does not comply with the applicable law or Standards;
- it is not in a pre-agreed format;
- it is such that it will not allow the *works* to be performed;
- it is such that the VLU2 Deliverables will be defective; or
- Bookwiring design & Factory Acceptance Testing (FAT) Report has not been issued to the *Project Manager* for acceptance.

(2) Design checks comply with one of four categories in accordance with the concepts set out in Clause 3.16 of LU Assurance Standard S1538.

(3) The *Contractor* is responsible for the design of the *works* and for any mistake, inaccuracy, ambiguity, inconsistency or omission between his design and the Works Information.

3.5 Design for the Works

(1) Within eight weeks of the Contract Date (or other timescale accepted by the *Project Manager*) the *Contractor*'s Design Manager provides a 'design assurance plan' containing the following information:

- A detailed programme
- A schedule of all deliverables

(2) The *Project Manager* may from time to time request to vary the order and/or content of the documents to be provided by the *Contractor* provided that the *Project Manager* has given 2 weeks advanced notice of his intention to do so.

3.6 Design Process

(1) The *Contractor* provides complete supporting information and obtains the *Project Manager*'s written acceptance for any concessions from the Works Information or Standards required for his design.

(2) The *Contractor* confirms compliance with, and as necessary makes cross references to, the Works Information and any other relevant contract documents.

(3) The *Contractor* provides Assurance packages and a compliance submission in timely fashion to obtain LUL "No Objection" statement in respect of the design. The *Contractor* provides all design information for the preparation of the Health & Safety File.

(4) The *Contractor* obtains all required design checks and third party technical approvals (if applicable) and carries out any reworking of the design necessary in order to obtain these approvals.

(5) The *Contractor* provides design check certificates.

(6) The *Contractor* is responsible for co-ordination, systems integration and quality control of his design, with his other equipment. The *Employer* is responsible for ensuring integration with other equipment. Should the *Employer* require the *Contractor* to perform additional work to enable integration with other equipment outside of that already specified in the Works Information, the *Project Manager* issues an instruction to change the Works Information.

(7) The *Contractor* complies with the quality plans and procedures and ensures that the Design Liaison Manager is kept informed of the *Contractor*'s progress at all stages during the preparation of *Contractor*'s design for the *works*.

3.7 Submission of *Contractor*'s Design Data

(1) Unless the *Project Manager* has notified the *Contractor* otherwise, the *Contractor*'s design is advanced to complete and suitable for implementation status before submission of the design data to the *Project Manager* for acceptance.

(2) The *Contractor* submits design data to the *Project Manager* for acceptance during design development, which comprises the items as specified by the *Contractor* in Contract Data Part Two.

(3) The *Contractor* and the *Project Manager* agree the design data to be submitted to consents and third party technical approval bodies (if applicable) and is appropriate to the application made.

3.8 *Project Manager*'s Acceptance

(1) To avoid any misunderstanding the *Project Manager* gives one of the following dispositions in relation to any item submitted for the *Project Manager*'s review, together with his comments:

- Accepted without comments (A)
- Accepted except as noted (AEAN)
- Not Accepted (NA)
- No review required to be undertaken.

"Accepted without comment (A)"

The *Contractor* adheres to the design which the *Project Manager* has accepted pending implementation.

"Accepted except as noted (AEAN)"

The *Contractor* reviews and incorporates the *Project Manager*'s comments in his design. Any Comments that can be incorporated as part of as-builts will be excluded.
If the *Contractor* decides not to incorporate the *Project Manager*'s comments then the *Contractor* must justify his decision for not agreeing, in detail, to the *Project Manager*. The *Contractor* resubmits the design to the *Project Manager* until acceptance is achieved in accordance with Section 4.4.

"Not Accepted (NA)"

The *Project Manager* gives his reasons for rejecting the design submitted. The *Contractor* resubmits the complete submission where possible within 10 working days of issue of such rejection by the Project Manager and demonstrates how the *Project Manager*'s comments have been taken into account in the resubmission. Where the nature of the comments requires longer to address, the *Contractor* advises the *Employer* within 5 days of receipt of the comments.

"No review required to be undertaken"

The *Contractor* adheres to the design which the *Project Manager* has not reviewed pending implementation.

(2) The *Contractor* carries out one review and incorporation of comments through a joint meeting. Any additional reviews will be instructed by the *Project Manager* as a change to the Works Information.

3.9 Not used

3.10 *Contractor*'s Proposed Changes to *Employer's* Requirements

(1) At any stage of the Design Phase the *Contractor* may propose any alternative solution to the design or methodology. If the *Project Manager* does not accept the proposal the *Contractor* continues with the original design and / or methodology.

3.11 Design Co-ordination

(1) This Section sets out the respective duties and powers of the Design Liaison Manager (representing the *Employer*) and the *Contractor*'s Design Manager (representing the *Contractor*) in relation to design co-ordination.

(2) The Design Liaison Manager (DLM) is appointed by the *Project Manager* but is not delegated any of the *Project Manager*'s duties under this contract unless expressly advised to the *Contractor* in writing. The *Contractor* therefore addresses all communications to the *Project Manager* with a copy to the Design Liaison Manager.

(3) The DLM has no authority to instruct the Contactor and the *Contractor* has no responsibility to act on any advice offered by the Design Liaison Manager.

(4) The Design Liaison Manager's duties include:

- acting as the *Project Manager*'s focal point for any design-related queries during preparation of the *Contractor*'s design for the *works*;
- liaising with the *Contractor* during the preparation of the *Contractor*'s design for the *works*;
- assisting the *Contractor* to prepare Assurance packages and the compliance submission, including advice on format and content of submissions;
- routine monitoring of the *Contractor*'s developing design particulars for compliance with the *Employer's* Requirements;
- routine monitoring of the *Contractor*'s progress against the periods allowed for design in the Accepted Programme and;
- monitoring the preparation and update of the records and the *Contractor*'s preparation of data for the Health & Safety File.

(5) The *Contractor*'s Design Manager's duties include:

- being the primary interface with the Design Liaison Manager on design matters;
- acting as the single point of contact for any design queries from the Design Liaison Manager, *Project Manager* and the *Employer*;
- chairing *Contractor*'s design team meetings;
- collating all design information and maintaining the official copy of the design; and
- being the first point of contact for any design changes irrespective of whether they are requested by the *Project Manager* or the *Contractor*.

3.12 Interfacing with Others

(1) The design for the *works* will interface with the works of Others including, among others, **REDACTED**. Such interfacing is arranged and coordinated by the *Project Manager*.

- Where details are required to be provided from the Train Supplier, the *Project Manager* obtains and passes such details to the *Contractor* as requested, in accordance with the Accepted Programme, in order to enable the *Contractor* to complete his design for the *works*.

(2) The *Project Manager* is responsible for requesting and receiving information to and from **REDACTED** and any other 3rd Party.

3.13 Design Records

(1) For audit requirements under Clause Z2.5 of the conditions of contract the Contractor maintains a comprehensive record and log of the design comprising :

Deliverable Records

- Design Check Certificates (including Certificates for *Contractor*'s Change)

- Compliance Submission
- Fire Compliance Certificate Bb224 (if required)
- Technical reports that are defined in the Work Packages
- Surveys and associated drawings
- Detailed designs and Designer's risk assessments
- Specifications
- Design drawings (including temporary works)
- Design calculations (including temporary works) that are defined in the Work Packages

Contractor Records

- Marked up drawings
- Check prints of drawings, reports and calculations
- Design Risk Management Log

3.14 Deliverables

(1) The *Contractor* provides, for the *Project Manager*'s review and acceptance a list of documents that the *Contractor* proposes to form part of the VLU2 Deliverables in relation to each of the Work Packages.

3.15 Correcting Errors or Omissions

(1) At any time before the Implementation Phase, the *Contractor* at no extra cost to the *Employer* will rectify any Defect, including any error or omission, in the design or associated documents in relation to the *works*.

3.16 Method Statement/Safety Issues

(1) Engineering safety is managed in accordance with the processes laid out in the 'Engineering Safety Management Plan' which includes among others:

- Design and maintenance risks are managed through coordination and collaboration in accordance with the requirements of the Construction (Design Management) Regulations 2015.
- The 'Site Health and Safety File' is developed and maintained over the duration of VLU2 Project for the phases contracted.

(2) All suppliers of the *Contractor* are, as far as reasonably practicable, subject to the QUENSH contract conditions.

3.17 Fire safety of materials, assessments and strategy for compliance

All cabling, materials and finishes proposed by the *Contractor* during the design phase comply with LU Category 1 Standard Fire safety performance of materials. Where this is not possible a Fire Waiver is sought via the appropriate discipline engineer(s).

3.18 Electromagnetic compatibility assessments

(1) No novel equipment is required and the EMC assessment has already taken place.

4 IMPLEMENTATION PHASE

4.1 Implementation Responsibility

(1) The Implementation Phase follows the acceptance by the *Project Manager* of the designs submitted by the *Contractor* and includes, but is not limited to, the satisfactory upload of software, completion of installation works, commissioning, testing and sign off of the *works* in accordance with the designs produced by the *Contractor*.

(2) Prior to commencing implementation, the *Contractor* submits for acceptance installation documents, method statements, risk assessments and test plans for each Work Package as follows:

(a) a detailed list for the scope of supply of new or modified hardware, software and trackside and train-borne equipment (where appropriate to each Work Package);

(b) a schedule of works for the installation works and testing and commissioning of trackside equipment (including off-site factory acceptance tests (FAT) and Site Tests);

(c) plans for the Installation / uploading of software to Train-borne systems to 47 no VLU 09TS trains (off-site FAT and Site); and

(d) a schedule of any enabling works agreed with the *Project Manager* to be undertaken in advance of the works to be undertaken by the *Employer*.

4.2 Implementation Process

(1) During the Implementation Phase and once instructed so to do the *Contractor* monitors the implementation of the *works* in accordance with the designs which have been accepted by the *Project Manager*.

(2) During the Implementation Phase of the works, the categories of acceptance are as follows:

a) 'Accepted without comment'

The *Contractor* adheres to the design which the *Project Manager* has accepted and construction proceeds.

b) 'Accepted with comments'

The *Contractor* reviews and incorporates the *Project Manager's* comments in his design and construction proceeds.
If the *Contractor* does not incorporate the *Project Manager's* comments, the *Contractor* justifies the reasons for not agreeing, in detail, to the *Project Manager*. The *Contractor* then resubmits the design to the *Project Manager* for acceptance.
Construction does not proceed unless the submission has been accepted by the *Project Manager* in accordance with the contract.

c) 'Rejected'

The *Project Manager* gives reasons for rejecting the design submitted.
Construction does not proceed. The design is revised by the *Contractor* and resubmitted.

5 COMPLETION

5.1 Completion

(1) The *completion dates* for the *works* including installation and associated testing and commission are as stated in the Contract Data.

(2) Not used.

(3) Not used.

(4) Work Package elements required as part of Completion are in accordance with Appendix 9.

(5) Completion requirements for the remainder of the works, comprises acceptance by the *Project Manager* of the following:

- provision of information for the health and safety file, including but not limited to as-built records;
- operation and maintenance manuals including spares schedules;
- operational resilience statements;
- all training;
- safety cases and assurances; and
- any necessary concessions granted.

6 PROGRAMME

(1) The *Contractor* submits his first programme to the *Project Manager* for his acceptance within eight weeks of the Contract Date.

(2) The *Contractor* submits, via the *Employer*'s document control at WCC_DCC@tubelines.com a 4 weekly update of the programme in an electronic format using Primavera Version 6.2.1 or lower.

(3) **REDACTED**

7 ADDITIONAL INFORMATION

REDACTED

8 CONTRACT MANAGEMENT

8.1 *Contractor*'s Representative

(1) The *Contractor* submits to the *Project Manager* for acceptance a communication plan such that there are clear lines of communication between the *Contractor* and the *Employer*'s team to facilitate:

- Receipt of instructions by the *Contractor*
- Understanding of levels of authority to receive instructions from the *Project Manager, Supervisor* or their delegate(s).
- Issue and receipt of other contractual communications

(2) The *Contractor* utilises A-Site, a web based document management system, for the purpose of document and information management with the *Project Manager*. The *Employer* will provide all necessary licences that the *Contractor* requires to utilise A-Site. The *Employer* grants read access to part of this system, and that it may be used as a platform for sharing documentation with the *Contractor*. In order to be granted access, the *Contractor* requires a computer with internet access and Windows XP or later version, and up to date antivirus and MS Office software. The *Contractor* makes allowance for his document controller and any other member of staff requiring training to attend a half-day session at the *Employer's* offices to receive the training.

(3) All contractual communication management (CCM) required under this contract are to be made under A-site unless the *Project Manager* has suspended use or advised it is not to be used. The *Contractor* will implement a folder structure management system to be agreed with the *Project Manager*.

8.2 Progress Meetings

The *Contractor* attends meetings convened by the *Project Manager* once every four weeks at the *Employer*'s offices in London to review:

- General progress update;
- Programme and progress status;
- Planning activity tracker completion status;
- Risks and/or other concerns;
- Safety;
- Contract administration
- Integration and/or Access requirements.

8.3 Progress Reports

(1) The first progress report is issued 2 weeks after the first period programme review and every 28 days thereafter, equidistant between programme reviews

(2) The format of the report is approved by the *Project Manager* prior to the submission of the first report and includes the following core sections:

a. General progress update;

b. Programme and progress status;

c. Planning activity tracker completion status;

d. Risks and/or other concerns;

e. Safety

f. Contract administration

g. Integration and/or Access requirements.

8.4 Contract Administration

Within four weeks of the *starting date* (or other timescale agreed by the *Project Manager*) the *Contractor* submits to the *Project Manager* for acceptance, the procedures to be implemented by the *Contractor* to ensure that the contract will be properly administered in accordance with the *Contractor*'s internal systems. The procedures set out detailed measures to demonstrate how the *Contractor* intends to:

- Administer any purchase orders in due time;
- Maintain a cost and commitment ledger and reporting system;
- Administer, monitor, check and record deliveries of any pre-purchase materials required for incorporation into the *works*; and
- Verify any properly incurred reimbursable costs pursuant to the contract.

8.5 Risk Management

(1) The *Employer* is committed to identifying and managing risk throughout the *works*.

(2) Risk in this context includes but is not limited to those events that could, if they do occur, impact on safety, the environment, the *Employer*'s interests or reputation, or the interests of Others.

(3) The *Contractor* cooperates with the *Project Manager*, the *Employer*, and with Others in providing information needed in connection with risk management of this contract.

8.6 Responsible Procurement

The Greater London Authority (GLA) Group aims to improve London's sustainability through its procurement processes.

The *Employer* is committed to the implementation of responsible procurement, based on the seven key themes:

(1) Encouraging a diverse base of suppliers. TfL (LU) is committed to the GLA Group Statement of Principles on Supplier Diversity, supporting Diversity Works for London, and ensuring that procurement processes are open to all of the supplier community including the voluntary and community sectors.

(2) Promoting fair employment practices. This includes the implementation of a London Living Wage, working with contractors to ensure reasonable minimum standards for their employees and the promotion of fair employment practices.

(3) Promoting greater environmental sustainability. TfL (LU) is committed to, waste minimisation, sourcing green energy, purchasing fair trade and organic food and drink, minimising emissions and reviewing the environmental management practices of suppliers.

(4) Promoting community benefits. TfL (LU) works to understand the impact of its procurement activities on the local community, encourage a positive contribution from suppliers to local communities and explore opportunities for developing contracts to deliver specific community benefits.

(5) Encouraging ethical sourcing practices. TfL (LU) is committed to equality of opportunity, compliance with national law and good practice Human Resources procedures, for instance in relation to working hours, health and safety and preventing the use of unethical labour sources, for instance child labour.

(6) Meeting strategic labour needs and enabling apprenticeships and training opportunities. TfL (LU) contracts (and Framework Agreements) include the provision of apprenticeships and relevant training and employment opportunities for under-represented groups and the long term unemployed and the promotion of new roles created by contracts within the local community.

(7) Promoting workforce welfare. TfL (LU) ensures its contract terms require suppliers to make provision for the welfare of their workforce and do not prevent, discourage or discriminate against employees who hold trade union membership.

The *Contractor* identifies in the procurement procedures the process proposed in respect of each of these themes to the extent applicable to the project, and supports these where appropriate by relevant evidence of actual practices, and compliance with the aims and outcomes.

The *Contractor* consults the following published documents, which are available in the “Corporate” and “Business and Partners” section of the TfL web site http://www.tfl.gov.uk :

- TfL's Green Definitions;
- TfL's Green Strategy;
- Supplier Diversity Policy Statement;
- Supplier Diversity Definitions;
- Supplier Diversity Policy;
- Supplier Diversity Strategy; and
- GLA sustainable Procurement Policy

The *Contractor* clarifies how these policy documents have been considered and how it will support LUL in complying with its obligations under the policies.

9 HEALTH, SAFETY AND ENVIRONMENTAL REQUIREMENTS

9.1 General Health, Safety and Environmental requirements (including Contract QUENSH Conditions)

(1) The *Contractor* complies with all of the requirements listed in the Contract QUENSH Conditions menu included as Appendix 2.

(2) The *Contractor* complies with the "London Underground Health, Safety and Environmental Management System Standards" which contain mandatory Category 1 Standards and, if stated, Category 2 and 5 Standards, Guidance Documents and template documentation.

(3) The *Contractor*'s health, safety and environmental performance is monitored by the *Project Manager* using the LU Supplier HSE Maturity Assessment. The default frequency for assessment against the criteria is quarterly, though this may be varied by the *Project Manager* in light of the level of activity or performance. The *Contractor* participates in the assessment through the provision of information and evidence requested by the *Project Manager* in respect of the criteria. The results of the assessment will be discussed with the *Contractor* upon completion. If required, the *Contractor* will be asked to prepare an action plan in response, progress against which is monitored as part of subsequent assessments. The full assessment criteria will be shared with the *Contractor*.

(4) The *Contractor* is wholly responsible for the provision of all necessary Personal Protective Equipment (PPE) to his staff, sub-contractors or other personnel that he engages to undertake the *works*. The standard of PPE varies in accordance with the locations where the *Contractor* is undertaking his work and is in accordance with those principles and to a standard required by the published LU QUENSH Standards. The minimum to be provided, in all cases during visits to LU premises are as follows:

- Hard hat with company branding,
- Eye protection (safety glasses),
- Hand protection (gloves),
- Safety footwear and,
- High visibility jacket and/or vest with company branding.

(5) The *Contractor* provides the level of protection appropriate to the tasks to be undertaken at the locations where the *works* are being carried out, for instance in confined working spaces, in accordance with the safety risk assessments that he undertakes for those tasks.

(6) Isolation of fire protection and detection systems:

(a) In the event that the *Contractor* requires to survey or work within areas where he requires the isolation of fire protection and detection systems he first gives notice to the *Project Manager* who in turn, notifies the *Contractor* of the Fault Reporting Centre(s) contact details.

(b) Isolation of automatic fire prevention and detection equipment is controlled in accordance with LUL Reference Manual Standard Bb229 'Fire precautions – Isolation of automatic fire detection and protection equipment'.

(c) The *Contractor* agrees the proposed isolation plan to suit his method of working with the *Project Manager*, giving due regard to the notice periods required to be provided to the relevant parties and requests the isolation from the Fault Reporting Centre.

(7) The *Contractor* complies with London Underground Work Related Road Risk requirements which

are detailed within Appendix 10 of this Works Information.

10 DOCUMENT MANAGEMENT

10.1 Accounts and Records

(1) Clause Z2.5 in the *conditions of contract* sets out the Minimum Records to be retained by the *Contractor* along with the requirements in relation to records, audit and inspection.

(2) The *Contractor* retains records in respect of the following:

(a) Documents submitted to provide Assurance and to verify compliance with the Employer's Requirements in relation to Quality and Assurance requirement and the LUL Standard S1538,

(b) Documents and records to be retained as required by QUENSH,

(c) Records submitted to record progress and contract performance and,

(d) Records required by other parts of the Works Information.

(3) All records to be retained are signed off by a member of the *Contractor*'s staff with the appropriate level of authority.

(4) Deliverable Records are issued in hard copy and electronic format in numbers as set out in the QUENSH. QUENSH does not detail numbers therefore 3 paper copies will be issued.

(5) Deliverable Records drawing files are prepared and issued in the same format as VLU1 the drawing files will be in Microstation format.

(6) *Contractor* Records are issued in electronic and hard copy format in accordance with the QUENSH menu and comply with the relevant provisions of Clause 4.2.3 of ISO 9001 with regard to document version control.

(7) Superseded documents are also considered to be records. The *Contractor* utilises LU pro-formas where available or propose standard forms for deliverable documents for acceptance by the *Project Manager*

10.2 Records Management

(1) The dates on which the *Contractor* prepares and submits the Deliverable Records for review by the *Project Manager* are included in the programme submitted for the *Project Manager*'s acceptance.

(2) Those documents requiring acceptance by the *Employer* and Others (including documents submitted for LU or ORR Safety Inspectorate non objection) are identified, and submission dates agreed with the *Project Manager* to prevent delays in the designing for the *works*.

(3) Deliverable Records are collated, packaged, indexed and submitted by the *Contractor* in a phased manner to the *Project Manager* for each element, structure, activity and so on as agreed with the *Project Manager*.

(4) Access to Deliverable Records are provided by the *Contractor* to the *Project Manager*, or to third

parties nominated by the *Project Manager*, as soon as the records become available.

11 QUALITY ASSURANCE

(1) General Quality requirements are defined in the Contract QUENSH Menu which is included at Appendix 2. The following requirements supplement the QUENSH requirements.

(2) The *Contractor* establishes and implements a Quality Management System (QMS) on the contract which complies with BS EN ISO 9001:2008 'Quality Management Systems – Requirements', and are updated during the duration of the Contract as and when BS EN ISO 9001:2008 is updated.

(3) The Contractor's consultants, Subcontractors and suppliers, as far as reasonably practicable, establish and implement a QMS consistent and compatible with the above.

(4) A Project Quality Plan (PQP) is submitted by the *Contractor* to the *Project Manager* for acceptance within eight weeks of the Contract Date. The PQP as a minimum addresses the guidelines set out in BS ISO 10005:2005.

(5) The PQP identifies the controls to be applied by the *Contractor* and his consultants, suppliers and subcontractors, including the organisation, key roles and responsibilities, the procedures to be applied by the *Contractor* to ensure compliance with the contract and the provision of Assurance evidence.

(6) The *Contractor* submits to the *Project Manager* with his PQP his consolidated audit schedule. The schedule, scope and method of audits enables the *Contractor* to verify compliance of the processes and procedures required and implemented to meet the requirements of the contract.

(7) The *Contractor* allows the *Project Manager* and authorised third parties to observe, participate in their audits and to conduct additional independent audits as they consider necessary. Unless it is a risk-based audit (in which case, there is no limit to the number of times a request for it can be raised provided the *Project Manager* has first given at least 10 working days written notice to the *Contractor*) the number of audits is no more than twice a year.

(8) All audits performed by the *Contractor* are as described in BS EN ISO 19011:2011 'Guidelines for Auditing Management Systems'.

(9) The *Contractor* maintains an Inspection and Test Plan (ITP) which is submitted to the *Project Manager* for acceptance. All tests and inspections conducted by the *Contractor* or his consultants, suppliers and subcontractors are in accordance with the accepted ITP's.

(10) The *Contractor* his consultants, suppliers and subcontractors meet the requirements of LU Standard S1203 'Competency of Personnel Working on Signal and Signal Control Systems'.

(11) The *Contractor* his consultants, suppliers and subcontractors when working on safety critical aspects of the signalling system modifications comply with LU Standard S1548 'Safety Critical

Work'.

(12) The QMS cover subjects and processes associated with all parts of the design and the design process including without limitation; quality, safety, programme, software, data, reliability, availability, maintainability and testing. The programme of Assurance deliverables is captured in the overall Project Assurance Plan that the *Contractor* produces.

(13) All updated product changes concerning any Work Package is accompanied by the appropriate *Contractor* and Supplier Software Release Certificates.

(14) The *Contractor* complies without limitation the following:

- BS EN ISO 9001:~~2008~~
- BS EN ISO 50121
- BS EN ISO 50126
- BS EN ISO 50128
- BS EN ISO 50129
- QUENSH London Underground Contract Conditions QUENSH (Quality, Environmental, Safety and Health) ref S1552 Issue A16 November 2014 Approved for issue
- S1538 – Assurance Standards
- S1193 to S1203 inclusive – Suite of Signalling Standards
- CDM Regulations 2015
- Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS)
- Health and Safety at Work Act 1974

(15) Confirmation of Assurance Plans

As part of the Assurance process the documents and certificates below are produced and maintained by the *Contractor* as part of the project files. The documents will be reviewed by the relevant *Contractor* personnel with the appropriate skill set:

- Project Assurance Plan
- Software/functional requirements specification
- Space allocation and power approvals
- Software/hardware integration test specification
- Cutting, drilling and fixing logs in accordance with S1063 A4
- Method statements
- Risk assessments
- Validation and verification reports
- Generic Application Safety Case including the specific Application Safety Case addenda as applicable.
- Independent safety assessment.
- Product Technical File if required
- CAT-S Design check certificates
- Compliance submission

Documentation to verify any changes incorporated by these *works* do not invalidate any relevant assurance documentation.

APPENDICES

Appendix 1	**Not Used**
Appendix 2	**Relevant Documents and Standards (QUENSH)**
Appendix 3	**Not Used**
Appendix 4	**Access Charter**
Appendix 5	**Outline Programme for VLU2 Project**
Appendix 6	**Conceptual Design Statements**
Appendix 7	**Test Scenarios**
Appendix 8	**Standards applicable to the VLU2 Project**
Appendix 9	**Schedule of Completion Requirements**
Appendix 10	**Work Related Road Risk**
Appendix 11	**Engineering Hours Access and Test Trains**
Appendix 12	**Plant and Materials to be provided by the *Employer***
Appendix 13	**Clarification / Exclusion Register**

Appendix 2 – Relevant Documents and Standards (QUENSH)

The *Contractor* complies with the latest version of the Contract QUENSH Conditions as appended to this document (Ref QUENSH - F0780 Contract Menu & QUENSH - Additional Contract Doc requirements list)

London Underground Contract Conditions QUENSH (Quality, Environmental, Safety and Health) ref S1552 Issue A17 August 2015 incorporating ***&*** – Additional Contract document requirements list and ***F0780 - Contract Menu*** (populated), revision 3 of menu.

REDACTED

Appendix 4 - Access Charter

See Appended document WI 1600 – Access Charter

Both parties acknowledge the importance of providing access to the Site to complete the Works in accordance with the programme and contract price. However, it is also acknowledged that the availability of access can change due to competing priorities by the Employer or by other works by the Employer.

The Employer will endeavour to provide the access upon which the contract is awarded and will work to resolve any issues that arise that could jeopardise this access. In addition, both parties throughout the period of the contract will work to identify how access can be enhanced to the mutual benefit of both.

In the event that access is reduced, both parties will work to mitigate the impact of reduced access including the re-sequencing of the Works to minimise the effect on the programme and contract price while maintaining quality and safety standards.

This clause will not affect the Contractor's entitlement to a compensation event pursuant to clause 60.1(2) in appropriate circumstances nor relieve the Employer from its overriding contractual commitment under clause 33.1 to allow access to and use of each part of the Site to the Contractor which is necessary for the work included in the contract.

Notes:

REDACTED

The *Employer* will using the procedures in the Access Charter to maximise the available time during engineering hours between traction current off and on to suit the duration of works as required by the *Contractor*. Exact dates and times as shown in Appendix 11 (Engineering Hours Access and Test Trains Required)

The *Employer* will endeavour to provide additional Access, however any access above and beyond that stated above will be deemed as opportunity and is not guaranteed.

The *Contractor* allows for attendance at access meetings & conference calls.

The *Contractor* needs to be aware of the new '8 week – LOCKDOWN period' for access to all LU premises and sites as follows:

- 'Lockdowns apply to any access requests that require publishing (Closure Request Timescales are unaffected by this change).
- The lockdown occurs at T-8 weeks (T-56days) from start of the week in which access is being requested.

- If applicable to the *works*, the Access Plan must have been agreed between the *Contractor* and the LU Accountable / *Project Manager* before the lockdown date and this must have been discussed with the Access Manager.

- You must also have completed a Works Request Form and this must have been submitted to the Access Team by the lockdown date. This is done via the Access Portal & may be done by the *Contractor* directly or via the LU Accountable / *Project Manager*. Who does this will be determined by the nature of the *works* and the contractual arrangements.

- No further changes to the Works Request Form will be permitted after this date.

- The Access Team may contact the requester to finalise any small details which are outstanding or to confirm changes which are required for optimisation & will confirm the booking arrangements between the start of T-5 weeks (T-35days) and the end of T-4 weeks (T-21days).

- The Look Ahead will be published on the Thursday T-3 weeks (version 1) and on the Wednesday of T-1 week (version 2)'

- Should you have any queries in relation to the above please seek the guidance of the *Project Manager* in the first instance.

Appendix 5 – Outline Programme for VLU2 Project

REDACTED

Appendix 6 – Conceptual Design Statements

REDACTED

Appendix 8 - Standards applicable to the VLU2 Project

The *Contractor* and *Employer* agree that the VLU1 Baseline Standards are used as a baseline and the additions / changes since this baseline are summarised below. For the avoidance of doubt, any reference to Current Standards in this Works Information means the baseline and such additions/changes. (The Price is deemed to include all allowances necessary for the *Contractor* to comply with such additions/changes to the extent required for the *works*.)

NB: A reference to “Section” within Appendix 8 means a reference to “section in the relevant Standard”

No	Standard Name	VLU 1 Baseline Standard Number & Issue Level (SRA Complying)	Current Standard Number (LU Delta Responsibility)	Changes	Comments REDACTED
1.	Safety signalling philosophy	E7001 A2 (Nov 2000)	S2500 A3 (Jan 2012)	**A3** - As per DRACCT No. 00609, E7001 renumbered, and revised to conform to new format, incorporate Written Notices and reflect revised Roles, Responsibilities and References. **No technical changes**	
2.	Signalling control systems	E7002 A3 (Nov 2000)	S2501 A5 (Jun 2015)	**A4** - As per DRACCT 00609, E7002 A3 renumbered and revised to conform to new format, reflect Written Notice (dated 08-11-2005, re EMC), rationalise EMC section and reflect updated Roles, Responsibilities & References. **No technical changes to requirements** **A5** - As per DRACTT 03208. Standard revised to reconcile differences between LU and former Tube Lines Category 2 Standard (TLL-ENG-7237-A1), and to adopt a new TfL template	
3.	Signalling equipment overhaul	E7004 A2 (Nov 2000)	S1202 A2 (Nov 2011)	E7004 was superseded by 2-01203-010 A1 in June 2007. This standard was then re formatted and re-numbered to 1-202, in October 2007. Standard re-numbered to S1202 in Nov 2011, reformatted and updated to reflect changes in Roles, Responsibilities and Definitions. **No technical changes.**	
4.	Wayside signalling	E7005 A1 (Dec 2003)	S2503 A3 (Jan 2013)	**A2** - As per DRACCT 00609, amended to incorporate: (i) Written Notices dated 27-03-	

				07 (internal ref. in 3.2.3.7) and 04-04-08 (re. RGI sighting requirements); (ii) correct typological and terminological inaccuracies and (iii) updated Roles, Responsibilities and references. **No technical changes** **A3** - Sections 3.5.3.1 and 3.5.5.2 clarified and modified to include supplementary detection. As per DRACCT No 01587	
5.	Commissioning of signalling systems	E7006 A2 (Nov 2000)	S2523 A3 (Mar 2012)	**A3** - As per DRACCT 00609, E7006 renumbered and revised to current format, to incorporate updated definitions of roles, responsibilities and references. **No technical changes**	
6.	Rail connection systems for signalling equipment cables	E7012 A2 (Nov 2000)	S2510 A3 (Mar 2012)	**A3** - As per DRACCT 00609, E7012 renumbered and revised to incorporate updates in responsibilities and referenced standards. **No technical changes**	
7.	Signalling and train control system maintenance	E7051 A3 (Nov 2000)	S2532 A4 (Mar 2012)	**A4** - As per DRACCT,00609, E7051 renumbered and revised to reflect updated Roles, Responsibilities and References. **No technical changes**	
8.	Automatic train control	E7052 A6 (Oct 2002)	S2506 A7 (Mar 2012)	**A7** - As per DRACCT 00609, E7052 renumbered and revised to conform to new format, incorporate Written Notice dated 12-07-2005 re. train stopping accuracy (Section 3.1) and incorporate updated documentation references. No technical changes	
9.	Signalling requirements for acceptance of rolling	E7053 A2 (Nov 2000)	S1180 A5 (Jun 2015) & S1195 A6 (Feb 2013)	Standard withdrawn in April 2012 and replaced with S1180 A4 Standard for Rolling Stock.	

	stock			Rolling stock requirements are also quoted within S1195 'Signalling Functional Requirements A5 - 3.3.8.3 Table 4 Grade D. Words in "Action required…" column revised for clarity. No other changes. DRACCT Ref. No. 03848	
10.	Signalling interlocking systems	E7054 A2 (Aug 2000)	S2504 A3 (Mar 2012)	**A3** - As per DRACCT 00609, E7054 renumbered and revised to conform to new format, and incorporate updated references. No technical changes	
11.	Train detection systems	E7055 A2	S2505 A3 (Mar 2012)	As per DRACCT 00609, E7055 renumbered and updated to conform to revised template, incorporate Written Notices, and include changes to document References.	
12.	Routine change periods for signal assets	E7060 A2 (Nov 2000)	S2533 A3(Jun 2015)	**A3 -** Standard revised to reconcile differences in requirements between LU and the former Tube Lines Cat 2 Standard (S7248), to include LU-WN-01281 and to conform with the new TfL Management System document format. **A2** - As per DRACCT 00609, E7060 re-numbered and revised to conform to new format and reflect updated Responsibilities and References. **No technical changes** Standard was re-numbered to MR-S-SIG-E7060 under Metronet and had the following changes incorporated: **A1 Oct 2009** – Amended in line with Asset Maintain Clarification Q Relays syntax	

				R5 Oct 2009 - Amended in line with Signal maintenance and assurance engineer. Trackside equipment routine change cycle clarified **R4 May 2009** - Amended in line with Asset Engineer Comments, transferred to new template. Categorisation information removed **R3 Feb 2009** - Additional Signalling Assets added and review comments from Deputy Asset Engineer **R2 July 2008** - Review comments from Head of Signals Control and Information **R1 Mar 2008** - Draft Issued for Review	
13.	Depot signalling	E7061 A2 (Nov 2000)	S2512 A4 (Jan 2013)	**A3** - As per DRACCT 00609, revised to conform to new standards format, and incorporate changed Roles, Responsibilities and References. **No technical changes** **A4** - Sections 3.2.2.4 clarified and modified to include supplementary detection. New paragraphs 3.2.2.5 and 3.2.2.7. Paragraphs 3.2.2.7, 3.2.2.8 and 3.2.2.9 renumbered. As per DRACCT No 01587	
14.	Maintenance of signal, signs and indicators	E7153 A4 (Nov 2000)	S2537 A5 (Jan 2012)	As per DRACCT 00609, E7153 renumbered, revised to conform to new format and incorporate updated documentation references. **No technical changes**	
15.	Engineering drawings for signal assets	E7169 A2	R0586 A1	Standard withdrawn 26/05/06 – replaced with reference document R0586 A1 Production of Signalling drawings, issued in May2012	
16.	Preparation of	E7201 A4	R0586 A1	Standard withdrawn 18/06/12– replaced with	

	engineering drawings for signal assets			reference document R0586 A1 Production of Signalling drawings, issued in May2012.	
17.	Environmental requirements for signalling equipment	E7202 A2 (Nov 2000)	S2508 A4 (June 2015)	**A3** - As per DRACCT 00609, E7202 renumbered and revised to reflect Written Notices dated 03-12-2003, 20-03-2008, and 17- 11-2009, to incorporate changes in EMC standards, and conform to new format. No specific technical changes **A4** - As per DRACCT 03208. Standard revised to reconcile differences between LU and the former Tube Lines Cat 2 Standard (TLL-ENG-S7264-A1)	
18.	Sighting of lineside signals, signs and indicators	E7203 A1 (Dec 2002)	S2507 A2(Feb 2012)	As per DRACCT 00609, E7203 renumbered, revised to new format, and incorporate Written Notice dated 20-03-2008 and updated Roles, Responsibilities and documentary references. **No technical changes**	
19.	Design of safety signalling	E7204 A3 (Nov 2000)	S2502 A4 (Feb 2012	As per DRACCT 00609, revised to incorporate Written Notices dated 16-08-2002, 25-08-2004, 29-07-2005, 11-04- 2006 and 27-03-2007 and reflect updated Roles, Responsibilities and References. **No technical changes.**	
20.	Signalling and control systems safety critical processes	E7500 A2 (Dec 2003)	S2529 A3 (Mar 2012)	As per DRACCT 00609, revised to conform to new format, and incorporate updates Roles, Responsibilities and documentary references. **No technical changes**	
21.	Alterations to the signalling system	E7501 A2 (Nov 2000)	S2513 A3 (Jun 2015)	**A2** - As per DRACCT,00609, E7051 renumbered and revised to reflect updated Roles, Responsibilities and References. **No**	

				technical changes **A3** - As per DRACCT 03208. Standard revised to reconcile differences between LU and former Tube Lines Cat 2 Standard (TLL-ENG-7269-A1), and to adopt the new TfL template.	
22.	Testing of signalling installation	E7511 A1 (Mar 2003)	S2524 A3 (Jun 2015)	**A2** - As per DRACCT 00609, E7511 renumbered, revised to conform to new format and incorporate revised cross-references, roles and responsibilities. **No technical changes** **A3** - As per DRACCT 03208. Standard revised to reconcile differences between LU and former Tube Lines Cat 2 Standard (TLL-ENG-7272-A1), and to adopt the new TfL template.	
23.	25KV 50Hz immunisation	E7720 A3 **Now a fossilised standard**.	S1196 A4 (Nov 2011)	Standard E7720 A3 withdrawn in May 2006. The 25KV 50Hz immunisation requirement is now incorporated in Category 1 standard 'Signalling And Signalling Control - Concept And Requirements' S1196 A4 **Fossilised Standards definition** **These are inactive Category 2 Standards which have been withdrawn as current Standards and have been archived by LU as 'fossilised standards', so that they are accessible for use until either** • **the assets they refer to have been de-commissioned and removed** **or** • **until revised Category 2 standards have been issued to replace them.**	

24.	Safety signalling single, twin and multi core cables	G7250 A2 **Now a fossilised standard**.	S1121 A2 (Sept2011)	Withdrawn 31/03/06 and replaced with 2-01001-005. This standard was subsequently replaced with S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011.	
25.	Trackside twisted pair signalling cables - limited fire hazard	G7624 A2 **Now a fossilised standard**.	S1121 A2 (Sept2011)	Withdrawn 26/05/06 and incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011.	
26.	Track crossing twisted screened cables limited fire hazard	G7625 A2 **Now a fossilised standard**.	S1121 A2 (Sept2011)	Withdrawn 26/05/06 and incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011.	
27.	Equipment room twisted screened pair signalling cable limited fire hazard	G7626 A2 **Now a fossilised standard**.	S1121 A2 (Sept2011)	Withdrawn 26/05/06 and incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011.	
28.	Safety critical licensing handbook	MR-S-0011 A1	S1552 A17 (Aug 2015)	Standard withdrawn. Requirements now incorporated within QUENSH standard S1552 Current issue A17 (Aug 2015)	
29.	Dual layer single core signal wire without mica tape	MR-SE-1093 A2	S1121 A2 (Sept2011)	Withdrawn and incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011	
30.	Requirements for solid state interlocking systems used on LUL	S&CSE-SE1023 03	S2504 A3 (Mar 2012)	Withdrawn 16/07/01 and replaced with Signalling interlocking systems standard S2504	
31.	Optical fibre cables	S&CSE-ST0014 A2	S1121 A2 (Sept2011)	Withdrawn 09/12/05 and incorporated into S1121 A2 Cables: Electric, Data and Fibre	

				Optic issued in September 2011	
32.	Installation handbook standards	S&CSE-ST0021 A2 (Feb 2001)	S2525 A3 (Mar 2012)	As per DRACCT 00609, cover document added to provide traceability and consistency in CMS. **No technical changes.**	
33.	Optical fibre cable joint enclosures	S&CSE-ST-0050 A2	S1121 A2 (Sept2011)	Withdrawn 14/10/05 and incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011	
34.	Permit to work	SCS03 02	WI 2502 A1 (Sept 2014)	Standard withdrawn 10/10/03. Now incorporated in WI 2502 A1 Sept 14 'Signals – processing an electrical permit to work (low voltage) and instruction for persons undertaking such work.	
35.	Accreditation to provide assurance	SCS07 1	S1538 A11 (Jun 2015)	Standard withdrawn 10/10/03. Now incorporated within Assurance standard S1538 **A11** changes: Updated to include environment and sustainability requirements, as per DRACCT No. 03489	
36.	Maximum allowable levels of electromagnetic interference in safety signalling	SCS-ST-00602 A3	S1193 A3 (Mar 2013)	Standard withdrawn 04/03/12 and incorporated into S2514, which was withdrawn 13/03/13. Now incorporated within S1193 Electromagnetic Compatibility with LU Signalling System Assets	
37.	37-core signalling cable screened cores PVC insulated PVC sheathed	SE-0427 B	S1121 A2 (Sept 2011)	Specification withdrawn from general use 30/03/01. Now a fossilised Specification. Refer to S1121 A2 Cables: Electric, Data and Fibre Optic	
38.	Cable multi pair	SE-0591 E	S1121 A2 (Sept 2011)	Specification withdrawn from general use	

	0.567mm2 PVC insulated, screened & sheathed			16/07/01. Now a fossilised Specification. S1121 A2 Cables: Electric, Data and Fibre Optic	
39.	Flexible equipment wire - non halogen	SE-0667 B	S1121 A2 (Sept 2011)	Specification withdrawn from general use 16/07/01. Now a fossilised Specification. S1121 A2 Cables: Electric, Data and Fibre Optic	
40.	Cables for equipment room signalling power supplies and earthing	SE-0774 B	S1121 A2 (Sept 2011)	Specification withdrawn from general use 16/07/01. Incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011	
41.	Track circuit feed cable - non halogen low smoke	SE-0895 B	S1121 A2 (Sept 2011)	Specification withdrawn from general use 16/07/01. Incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011	
42.	Relay and equipment racks - manufacture and wiring	SE-0921 B	N/A	Specification withdrawn 16/07/01	
43.	Train position detectors	SE-0943 A	S2505 A3 (Mar 2012)	Specification withdrawn 16/07/01. Position detector requirement now incorporated within S2505 ‘Train Detection Systems’	
44.	Single core cable for bonding to the running rails for use with blockjointless track circuit equipment	SE-0955 B	S1121 A2 (Sept 2011)	Specification withdrawn 09/12/05 and incorporated into S1121 A2 Cables: Electric, Data and Fibre Optic issued in September 2011	
45.	Specification for	SE-0995 C	S2525 A3 (Mar 2012)	Specification withdrawn 16/07/01. Superseded by information contained within	

	general purpose ties			Signalling Installation Handbook	
	The following Cat 1 standards also apply to the VLU2 project				
46.	Signalling Control – Functional Requirements	1- 194 A2 (Apr 2008)	S1194 A3 (Nov 2011)	**A3** Renumbered, reformatted and revised to clarify inconsistencies, incorporate Written Notices (dated 4-12-2008 and 26-02-2009), and reflect changes in Roles, Responsibilities and References as per DRACCT No. 00608. **No technical changes.**	
47.	Signalling – Functional Requirements	1-195 A1 (Oct 2007)	S1195 A6 (Feb 2013)	**A2** WN LUL/WN/00697 incorporated, note added after clause 3.6.3.1.2 WN LUL/WN/00582 incorporated, note added after clause 3.7.4.3 **A3** PSC Comments sheet S1-00940 incorporated. Clause 3.1.3.4 amended. **A4** Revised to reflect updated References and Responsibilities. No technical changes. **A5** Amend typo error 3.4.5.4 as per DRACCT No. 01519 **A6** Sections 3.6.3.3.3, 3.6.3.4.3, 3.6.3.4.4, 3.6.5.10 and 3.12.3.1.4 revised to clarify the need for supplementary drives and detection. As per DRACCT No 01587	
48.	Signalling and Signalling Control – Concept and Requirements	1-196 A1 (Oct 2007)	S1196 A4 (Nov 2011)	**A2** Changes agreed at the Director Led Review Meetings – TLL Standards Review - Signals **A3** WN/00763 and WN/00782 incorporated **A4** Renumbered, reformatted and revised to	

				incorporate Written Notice (dated 25-06-08, regarding Earthing standard), plus changes reflecting updated definitions of Roles, Responsibilities, definitions and cross-references. As per DRACCT No. 00608. **No technical changes**	
49.	Signalling and Signalling Control – Design and Implementation	1-197 A1 (Oct 2007)	S1197 A4 (Nov 2011)	**A2** Changes agreed at the Director Led Review Meetings – TLL Standards Review - Signals WN LUL/WN/00722 incorporated, clauses in section 3.8.2 amended **A3** PSC Comments sheet S1-00940 incorporated. Clause 3.2.6.2.2 and 3.3.1.1 amended. **A4** Revised to incorporate changes reflecting: Written Notices dated 09-11-07, 23-10-09 (2 off) & 08-07-11; updated definitions of Roles, Responsibilities, Definitions and cross-references**. No technical changes (except for the removal of references to oil fired point heaters).**	
50.	Signalling and Signalling Control – Installation, Testing, Commissioning and Handover	1-198 A1 (Aug 2007)	S1198 A3 (Nov 2011)	**A2** PSC Comments sheet S1-00950 incorporated. Clause 2.5, 2.5.1 and 2.5.2 added. **A3** Re-numbered, reformatted and revised to incorporate updated Roles, Responsibilities and References as per DRACCT No. 00608. **No technical changes**	
51.	Signalling and Signalling Control – Operation and	1-199 A1 (Oct 2007)	S1199 A4 (Feb 2014)	**A2** PSC Comments sheet S1-00950 incorporated. Clause 3.1.5.2 amended and clauses 2.4, 2.4.1 and 2.4.2 added. **A3** Renumbered, formatted and revised to	

	Maintenance			reflect Written Notice (dated 23-10-09), incorporate updated Roles, Responsibilities and Reference as per DRACCT No. 00608. **No technical changes** **A4** Changes to Attachment A, Table 1 following introduction of emergency trainstops with head proving. Change Duty SOM to DSIM to align with current terminology. DRACCT No 02275	
52.	Signalling and Signalling Control – Alterations to Systems	1-200 A1 (Oct 2007)	S1200 A3 (Nov 2011)	**A2** Changes agreed at the Director Led Review Meetings - TLL Standards Review - Signals **A3** Re-numbered, reformatted and updated to reflect changes to Roles, Responsibilities and References as per DRACCT No. 00608. **No technical changes**	
53.	Signalling and Signalling Control – Approvals	1-201 A1 (Oct 2007)	S1201 A4 (Nov 2011)	**A2** Changes agreed at the Director Led Review Meetings – TLL Standards Review – Signals **A3** WN/00762 incorporated **A4** Updated to reflect changes in Roles, Responsibilities and References. **No technical changes**	
54.	Signalling Equipment Overhaul	1-202 A1 (Oct 2007)	S1202 A2 (Nov 2011)	**A2** Re-numbered, reformatted and updated to reflect changes in Roles, Responsibilities and Definitions. **No technical changes**	

55.	Competence of personnel working on signalling and control systems	1-203 A1 (Oct 2007)	S1203 A4 (Jun 2014)	**A2** Updated following a change in legislation. Addressed comments on PSC M1-01159 Clause 3.2.4 amended, Clause 3.2.5 added and Clause 3.2.6 amended to address Infraco 'further comments' Clause 3.2.5 and 3.2.6 amended to address Infraco 'final comments' **A3** Re-numbered, reformatted and updated to incorporate Written Notices and changes to Roles & Responsibilities and references as per DRACCT No. 00608. **No technical changes** **A4** Updated to remove reference to the withdrawn Standard 1-266 (Competence Assurance) as per DRACCT No. 02643.	
56.	Safety Related Software	1-210 A1 (Aug 2007)	S1210 A2 (Mar 2014)	**A2** Updated to include latest version of BS EN 50128 (2011) and addition of software security requirements as per DRACCT No. 02177.	
	Additional CAT 1 Standards required for VLU2 Project				
57.	Assurance	E1008	S1538 A11 (Jun 2015)	E1008 'Introduction of new & altered assets to the railway' was incorporated into 1-538 A1 in Feb 2008. This Standard was re-numbered to S1538 in Jan 2012 **A11** - Updated to include environment and sustainability requirements, as per DRACCT No. 03489	
58.	QUENSH - London Underground Contract Conditions	N/A	S1552 A17 (Aug 2015)	A17 changes as follows: • Reformatted	

				• revised to incorporate Written Notice LU-WN-01313 • All temporary works shall comply with the requirements set out in LU Standard S1062 Temporary Works • Section 13 – Remove Protection workers on the track • 16.3 – Protecting workers on the track activity • Section 14.3.3 Remove various reference to Protecting workers on the Track • 22.4 The heading needs to change to "Person providing protection" • Definition – Include Protecting Workers on the Track A person certificated by LU to safely manage worksites and provide protection for themselves and others in engineering hours, traffic hours, depots and possession worksites. The Protecting Workers on the Track certificate will be endorsed with the relevant activity. • Section 44 include revised Plant standards • 35 Conveyance of loads	
59.	Safety Critical Work	N/A	S1548 A4 (Jun 2012)		
60.	Cutting, grinding, drilling, fixing to and supporting from existing structures	E3716	S1063 A4 (Sept 2014)	Replaced standard E3716 in 2012	
61.	Integration of Human Factors into Systems	N/A	S1217 A2 (May 2013)		

	Development				
62.	Human Systems Interaction - Dialogues and Notifications	N/A	S1218 A2 (Apr 2014)	Previously titled '1-218 - Universal Human Computer Interaction'	
63.	Good Practice In Human Factors Integration	N/A	G0217 A2 (Jan 2009)		
64.	Electromagnetic Compatibility	N/A	S1222 A2 (Nov 2012)	Overarching standard for EMC, which calls up and makes reference to S1193 (listed above on page 10 in relation to SCS-ST-00602 A3)	
65.	Requirements for systems engineering processes	N/A	S1209	Revised to define process requirements which align with ISO/IEC 15288:2008 and be more widely applicable for alignment with TfL Pathway as per DRACCT No. 02939. Previous version is no longer valid for new projects or programmes	
	National Standards				
66.	Quality management systems -- Requirements	N/A	BS EN ISO 9001:2015		
67.	Railway applications. The specification and demonstration of reliability, availability,	N/A	BS EN ISO 50126 (1999)		

	maintainability and safety (RAMS). Basic requirements and generic process				
68.	Railway applications. Communication, signalling and processing systems. Software for railway control and protection systems	N/A	BS EN ISO 50128 (2011)		
69.	Railway applications. Communication, signalling and processing systems. Safety related electronic systems for signalling	N/A	BS EN ISO 50129 (2003)		
70.	CDM Regulations	N/A	2015		
71.	Railways and Other Guided Transport Systems (Safety) Regulations (ROGS)	N/A	2006		
72.	Health and Safety at Work Act	N/A	1974		

Appendix 9 – Schedule of Completion requirements

REDACTED

Appendix 10 – Work Related Road Risk

A10.1 For the purposes of Appendix 10 (inclusive), the following expressions have the following meanings:

Bronze Accreditation the minimum level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.com;

Car-derived Vans a vehicle based on a car, but with an interior that has been altered for the purpose of carrying larger amounts of goods and/or equipment

Collision Report a report detailing all collisions during the previous 12 months involving injuries to persons or fatalities

Delivery and Servicing Vehicle a Lorry, a Van or a Car-derived Van

Driver any employee of the *Contractor* (including an agency driver), who operates Delivery and Servicing Vehicles on behalf of the *Contractor* to Provide the Works

DVLA Driver and Vehicle Licensing Agency

FORS the Fleet Operator Recognition Scheme, which is an accreditation scheme for businesses operating van and lorry fleets. It offers impartial, independent advice and guidance to motivate companies to improve their compliance with relevant laws and their environmental, social and economic performance

FORS Standard the standard setting out the accreditation requirements for the Fleet Operator Recognition Scheme, a copy of which can be found at: www.fors-online.org.uk

Gold Accreditation the highest level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk

Lorry a vehicle with an MAM exceeding 3,500 kilograms;

MAM the maximum authorised mass of a vehicle or trailer including the maximum load that can be carried safely while used on the road;

Side Guards guards that are fitted between the front and rear axles of a Lorry and that comply with EC Directive 89/297/EEC and the Road Vehicles (Construction and Use) Regulations 1986; and

Silver Accreditation the intermediate level of accreditation within the FORS Standard, the requirements of which are more particularly described at: www.fors-online.org.uk

Van a vehicle with a MAM not exceeding 3,500 kilograms

A10.2 Fleet Operator Recognition Scheme Membership

(1) Where the *Contractor* operates Delivery and Servicing Vehicles to Provide the Works, the *Contractor,* within 90 days of the date of the contract:

(i) (unless already registered) register for FORS or a scheme, which in the reasonable opinion of TfL, is an acceptable substitute to FORS (the "**Alternative Scheme**"); and

(ii) (unless already accredited) have attained the standard of Bronze Accreditation (or higher) or the equivalent within the Alternative Scheme and maintains the standard of Bronze Accreditation (or equivalent standard within the Alternative Scheme) by way of an annual independent assessment in accordance with the FORS Standard or take such steps as may be required to maintain the equivalent standard within the Alternative Scheme. Alternatively, where the *Contractor* has attained Silver or Gold Accreditation, the maintenance requirements are undertaken in accordance with the periods set out in the

FORS Standard.

A10.3 Safety Equipment on Vehicles

(1) The *Contractor* ensures that every Lorry, which it uses to Provide the Works:

(i) have Side Guards, unless the *Contractor* can demonstrate to the reasonable satisfaction of TfL that the Lorry will not perform the function for which it was built if Side Guards are fitted;

(ii) have front, side and rear blind spots completely eliminated or minimised as far as practical and possible, through the use of fully operational direct and indirect vision aids and driver audible alerts;

(iii) have equipment fitted with an audible means of warning other road users of the Lorry's left manoeuvre; and

(iv) have prominent signage on the Lorry to warn cyclists and other road users of the dangers of passing the Lorry on the inside and of getting too close to the Lorry.

A10.4 Driver Licence Checks

(1) Where the *Contractor* operates Delivery and Servicing Vehicles to Provide the Works the *Contractor* ensures that:

(i) 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

(ii) each of its Drivers engaged to Provide the Works has a driving licence check with the DVLA or such equivalent before that Driver commences work and that the driving licence check with the DVLA or equivalent authority is repeated in accordance with either the following risk scale (in the case of the DVLA issued licences only), or the *Contractor's* risk scale, provided that the *Contractor's* risk scale has been Approved in writing by TfL within the last 12 months:

Points incurred on a driving licence within 12 months of any check:

(a) 0 – 3 points on the driving licence – annual checks;

(b) 4 – 8 points on the driving licence – six monthly checks;

(c) 9 – 11 points on the driving licence – quarterly checks; or

(d) 12 or more points on the driving licence – monthly checks.

A10.5 Driver Training

(1) Where the *Contractor* operates Delivery and Servicing Vehicles to Provide the Works the *Contractor* ensures that each of its Drivers undergo approved progressive training (to include a mix of theoretical, e-learning, practical and on the job training) and continued professional development to include training covering the safety of vulnerable road users and on-cycle hazard awareness, throughout the term of the Contract.

A10.6 Collision Reporting

(1) Where the *Contractor* operates Delivery and Servicing Vehicles to Provide the Works, the *Contractor*:

(i) ensures that it has a system in place to capture, investigate and analyse road traffic collisions that results in fatalities, injury or damage to vehicles, persons or property and for generating Collision Reports; and

(ii) within 15 days of the Commencement Date, provide to TfL a Collision Report. The *Contractor* provides to TfL an updated Collision Report within five working days of a written request from TfL.

A10.7 Self-Certification of Compliance

(1) Where the *Contractor* operates Delivery and Servicing Vehicles to Provide the Works, within 90 days of the Commencement Date, the *Contractor* makes a written report to TfL detailing its compliance with the "WRRR Self-certification Report". The *Contractor* provides updates of the WRRR Self-certification Report to TfL on each three month anniversary of its submission of the initial WRRR Self-certification Report.

A10.8 Obligations of the *Contractor* Regarding Subcontractors

(1) The *Contractor* ensures that those of its Subcontractors who operate Delivery and Servicing Vehicles to Provide the Works:

(i) comply with Clause A10.2; and

(ii) where its Subcontractors operates the following vehicles to Provide the Works complies with the corresponding provisions of this Works Information:

(a) For Lorries – A10.3, A10.4, A10.5 and A10.6; and

(b) For Vans – Clauses A10.4, A10.5, and A10.6, as if those sub-contractors were a party to this Contract.

A10.9 Failure to Comply with Work Related Road Risk Requirements

(1) Without limiting the effect of any other clause of this Contract relating to termination, if the *Contractor* fails to comply with Clauses A10.3, A10.4, A10.5, A10.6, A10.7 and A10.8:

(i) the *Contractor* has committed a material breach of this Contract; and

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

Appendix 11 – Engineering Hours Access and Test Trains

REDACTED

Appendix 12 – Plant and Materials to be provided by the *Employer*

REDACTED

Appendix 13 - Clarification / Exclusion Register

REDACTED