

SCHEDULE 13

Documentation and Document Control

General

1.1.1 The Contractor shall provide, maintain and update all Documentation, as described in this Contract over the Contract Duration and form and operate a controlled issue system for both the Company Employees and the Contractor's staff. Company copy holders shall be named by the Project Manager.

1.1.2 Wheresoever Company Standards are invoked within this Schedule the Contractor shall use such Company Standards in the generation of Documentation for the Trains, Equipment, Enabling Works and Services. In the event that the Company Standard is inappropriate to the Trains, Equipment, Enabling Works and Services the Contractor shall utilise best practice in the activity, discipline or work referenced to the satisfaction of the Project Manager.

1.1.3 The Contractor shall supply three copies of all Documentation.

1.1.4 All Documentation shall be submitted in the English language using SI units.

1.1.5 All Documentation presented as printed material shall use paper of suitable quality for a retention time of 40 years.

1.1.6 All Documentation shall be capable of producing legible copies suitable for printing and microfilming and shall be of a quality suitable for long term storage without deterioration or fading.

The Contractor shall retain a full design audit trail of documents listed on the Documentation register. This shall include all revisions of documents issued to the Company and returned comments from the Company.

Documentation Plan

1.2.1 The Contractor shall provide and maintain a Documentation plan which shall be agreed with the Project Manager. The plan shall fully define the rationale for all Documentation required to be reviewed and/or delivered to the Company (both draft and final versions) as described in this Contract. The rationale shall include, but not be limited to:

- (a) authorship (Contractor, sub-contractor or other);
- (b) description of contents; and
- (c) format of documentation (and medium where this is not hard copy).

1.2.2 The Documentation plan shall incorporate a programme and document register.

Documentation Programme and Register

1.3.1 The Contractor shall provide within 8 weeks of the date of this Contract a detailed Documentation programme and register which:

- (a) identifies, for each deliverable item of Documentation, the draft and final versions (this programme shall identify Documentation requirements for the whole scope of this Contract);
- (b) details the delivery date, timing and phasing of the production of draft and final Documentation;
- (c) identifies the period of review by the Company for each item of Documentation;
- (d) includes:

- (i) a master list of all manuals, drawings and documentation to be submitted by Contractor; and
- (ii) a list to include document reference number, revision number, title and submittal date.

1.3.2 The register is to be updated at 4 weekly intervals and submitted with progress reports.

1.4 Documentation Schedule in respect of the Trackside Equipment

1.4 The Contractor shall provide the following documents.

Category	Description
BB	DESIGN DOCUMENTATION
BB-4	System Requirements Specification
BB-6	Computer System Documentation
BB-7	Reliability Documentation
BB-8	General Arrangement Drawings
	- Overall dimensions
	- Outline arrangement
	- Weight limit
	- Lifting devices
	- Materials of construction

- Paint, finish and colour
- Maintenance access
- Cable entries, glands, connectors and terminal locations
- Internal protection ratings
- Installation access and clearances for doors etc
- Equipment labelling

BB-9 Mechanical Interface Details

- Fixing dimensions
- Anchor bolt details
- Weight
- Forces and movements transmitted to the supports

BB-10 Equipment Arrangement Drawings

- Panel layout and rack mounting position
- Details of labels, instructions warnings

BB-11 Block Diagrams

- Functional schematic of major system components
- Interfaces
- Impedances and line levels

BB-12 Cable Distribution Drawings

- External cabling between equipment items
- Cable function and reference numbers
- Gland or connector type

BB-13 Cable Termination Drawings

- Internal and external connections to all equipment including to interface equipment provided by others
- Cable reference numbers
- Cable core identity numbers and colour coding
- Terminal reference numbers
- Screening and earthing terminations

- Interface terminations

BB-14 Cable Schedules

- Cable reference number
- Cable type
- Equipment to be interconnected
- Cable internal and external dimensions
- Cable length, bending radius and weight/unit length
- Gland or connector type and size

BB-15 Electrical Single Line Diagrams

- Overall power supply distribution to equipment
- Form of electrical protection and ratings
- Power ratings, current, voltage, supply phases etc.

BB-16 Earthing and Screening Drawings

- Overall drawing showing principles of earthing and screening within and external to the equipment

BB-17 Cable Routing/Fixing Arrangement

- For cable routed within the Equipment Rooms and externally

BB-18 Electrical Interface Drawings

- Detailed information on interface requirements to suppliers equipment and equipment provided by others
- Channel allocation schedules and branching tables

BB-19 Equipment Schedule

- Detail equipment, cable and material list required at each site

BB-20 Equipment Data Sheets

- Detailed description of equipment units
- Equipment brochures

- Technical characteristics such as curves, tables and diagrams
- Equipment certification

BB-21 System Design Calculations

- Final design calculations on system configuration including power supply, earthing and communications
- Radio Propagation Calculations (including gains/losses and mechanical tolerances)
- Channel Transmission Performance

BB-22 Cable Specification

- Technical characteristics of all internal and external cable including physical dimensions, materials and electrical details

BB-23 Paint/Coating Specification

- For all internal and external equipment

BB-24 Weight Data Sheets for each location:-

(a) Preliminary Weight Data

(b) Final Weight Data

BB-25 Utility Consumption List for each
Equipment Location:-

(a) Equipment Power Consumption

- Quiescent and peak values
watts
- Operating voltage, frequency
and phase

(b) Equipment Heat Dissipation

- Quiescent and peak values

BB-26 Equipment Packing Lists

- Detailed list for each Site
location

BB-27 Systems Manuals

BB-28 Maintenance Manuals

BB-29 Training

- Details of training courses,
courses duration and location

CC TESTING AND COMMISSIONING

	As Schedule 4
DD	INSTALLATION
DD-1	Installation Plan
	- Detailed programme for installation at each Site location
DD-2	Installation Documentation
EE	PLANNING QUALITY ASSURANCE
	As Schedule 4
FF	SAFETY
	As Schedule 8
GG	AS-BUILT DOCUMENTATION
	As this Schedule 13

DOCUMENT STANDARDS

2.1 All Documentation, submitted by the Contractor for approval/review shall comply with the following provision of this paragraph 2.

2.2 The Documentation shall be complete and of good legible quality, and signed off as approved by the Contractor's representative.

2.3 The Documentation, if drawings, shall be submitted on "A" series sheets as specified in BS 3429 and Company Standard RME 736. Where drawings are larger

than A3, the Contractor shall ensure, so far as is reasonably practicable, that these drawings can be photo reduced to A3 without loss of clarity. Drawings shall bear the following information:

- (a) contract no;
- (b) equipment title;
- (c) equipment no;
- (d) document code identifier;
- (e) unique document number;
- (f) revision;
- (g) originator, checker and approval signatures; and
- (h) location and system identifier code as specified in Northern Line Project Procedure PP117 for all drawings of Trackside Equipment and the Enabling Works.

2.4 All Documentation other than drawings shall have a front cover sheet stating the title, date, document reference number and Contract number and location and system identifier code (as per (h) of paragraph 2.3 above).

2.5 When schematics or diagrams are submitted, they shall be accompanied by all the necessary supplementary information to describe the function and operation of the Equipment and as the Project Manager may reasonably require for full appreciation of the design, methods of installation and operation of the Trains, the Trackside Equipment, the Enabling Works and the other Equipment.

2.6 When Documentation is revised and/or re-submitted for approval all revisions shall be clearly marked, the revision status shall be marked clearly on the title page or block, incorporated into the document reference number and on all comprising pages.

2.7 Drawings shall be provided both in hard copy and on magnetic media. The information on magnetic media shall be compatible with the Company's CAD system, to the satisfaction of the Project Manager. The transfer of information may be via 8 mm Exabyte compact video tape, 3.5 or 5.25" double sided, double density diskette, all transmitted media shall be accompanied by documentation showing the loading method, the files within and the status of the files together with all relevant symbol libraries.

For information the Company, at the date of signature of this Contract, uses the following CAD software:

- (i) Autocad R12;
- (ii) Autocad LT R1 with DWG file format;
- (iii) Integraph Microsoft V5.0 with DGN file format.

2.8 When attribute samples are forwarded to the Project Manager, two shall be sent. Once reviewed one shall be retained while the other will be returned to the Contractor.

2.9 Where models or mock-ups are used or required only one of each assembly shall be required by the Project Manager.

2.10 Each document shall contain an approved block in the lower right hand side of the front sheet detailing the approval categories "Accepted", "Accepted Subject to Amendment" and "Not Accepted" and a space for Company signature and date.

2.11 In respect of Equipment, all drawings shall be Site specific, unless the drawing is of a general nature (eg a system schematic) or the drawing covers more than one Site and this is agreed with the Project Manager.

2.12 The Company may require copies of non-drawing Documentation in electronic format. In this case the Contractor shall ensure that any information provided is compatible with the following business software:

- (a) Microsoft Word v 6.0;
- (b) Microsoft Excel v 5.0;
- (c) Microsoft Powerpoint v 4.0;
- (d) Microsoft Access v 2.0;
- (e) Visual Basic Pro. Edition v 3.0 (for Trackside Equipment systems only).

TRAINS: ELECTROMAGNETIC COMPATIBILITY (EMC) DOCUMENTATION

3.1 All Documentation required for the design review, approval and verification processes for the EMC requirements for the Trains and for type test and post delivery tests of the Trains shall be submitted for the approval of the Project Manager in accordance with paragraph 2.4 of Schedule 4, in the design stages set out in paragraph 2.3 of Schedule 4, and shall comply with the requirements for testing specified in paragraph 4.3 of Schedule 4.

3.2 If it is identified that any Documentation listed in either paragraphs 2.3 or 2.4 of Schedule 4 are not required, this must be agreed with the Project Manager at the start of design scrutiny.

3.3 Evidence of EMC quality assurance procedures for components and sub-systems appropriate to EMC must be given in the design review documentation.

SOFTWARE DOCUMENTATION

General

4.1 The Contractor shall supply agreed source code and Documentation to enable the Company to discharge its obligations under the legislation listed in Part J of Schedule 6 and Schedule 8. The Documentation shall comply with the requirements of RIA 13, RIA 23 and Company Standard RSE/STD/031-Part 1 as appropriate. Other source code and Documentation shall be placed in escrow in accordance with the terms of the Escrow Agreement in Schedule 17.

Software Documentation Standards

4.2.1 Details of the Documentation submitted will depend on the stage of the project. The format of the Documentation shall follow the RIA 23 Standard in principle. All documents shall be updated throughout the Contract Duration if changes in design are made.

4.2.2 The following information concerning the software shall be delivered to the Project Manager in hard copy form, all items to be submitted at the beginning of the conceptual design stage:

- (a) a top-level clients' requirement specification detailing the requirements of the complete software system;
- (b) a software quality plan detailing the procedure of quality control in the process of inspection and review of software design;
- (c) a software project management plan detailing the authority and accountability of senior management in overall acceptance of the software design;

- (d) a system acceptance plan detailing validation, verification and analysis techniques used to assess the system software;
- (e) a configuration management plan detailing the process of issuing, updating and controlling system software and all system data;
- (f) a functional specification detailing data transfers at the system input/output, data transfer between modules, data and control flow of the system and data/entity relationships etc.;
- (g) description and diagrams of the overall system design, including structure, 'family tree', timing data, etc.;
- (h) detailed documentation for each programme module, i.e. written description, flowcharts (or equivalent) and commented source listings with comments at a minimum of every ten lines of code;
- (i) database structures;
- (j) input/output structures;
- (k) array structures;
- (l) details of the computer and operating system used for data generation or software development, if different from the main system.

INSTALLATION DOCUMENTATION (THE EQUIPMENT)

5. Before commencing installation, the Contractor shall supply an installation manual (method statement) for each Site location and for the cable installation interconnecting all Sites. The manuals shall include all details including but not limited to:

- (a) unpacking, lifting and handling procedures and storage requirements;

- (b) inspection procedures to verify the 'as-delivered' condition;
- (c) instructions, precautions, checks and safety issues necessary for equipment installation;
- (d) applicable drawings, e.g. layout, fixing details, cable termination details, etc.;
- (e) scope of equipment to be supplied by the Contractor and that provided by others to complete the installation;
- (f) details of all interfaces and relative responsibilities of Contractor and third parties in implementing the work;
- (g) details of any resources to be provided by the Company;
- (h) equipment preservation covering the delivery of the equipment to Site.

MANUALS

6. Contractor's Manuals

6.1 The Contractor's manuals used in the operation and maintenance of the Trains, the Trackside Equipment and the equipment used in the Services shall be produced in such a manner as to be easily understood by those undertaking their operation and maintenance and shall include manufacturers' instructions where appropriate. The Company and LUL shall only have the right to use the manuals in its audit process of the maintenance and operation of the Trains, the Trackside Equipment and the equipment used in the Services and for no other purpose.

7. Company Manuals

7.1.1 The Contractor shall produce and maintain Documentation for use by the Company and/or LUL in the operation of the Trains.

7.1.2 Such Documentation shall be submitted under the design assurance procedure when the Contractor produces draft copies, final copies and updates of final copies. This Documentation shall include that provided as training material.

Train Operating Manuals

7.2.1 Train Operating Manuals shall be prepared in close consultation with the Project Manager. Fifty controlled copies shall be supplied.

7.2.2 The Train Operating Manuals shall be printed in A4 format, securely bound in a manner allowing easy updating.

7.2.3 The Train Operating Manual shall be a reference document which shall enable Train Operators to understand and operate the Trains. It will be used extensively by the Company's or LUL's training instructors in the preparation and delivery of Train Operator training. The first issue of the final Train Operating Manual shall be provided as specified in the table set out in paragraph 6 of Schedule 5.

7.2.4 The Train Operating Manual shall contain, but not be limited to, the sections specified in this paragraph 7.2.4.

Introduction

7.2.4.1 An introduction shall describe the formation and numbering of the Trains and assumes a basic knowledge of previous Train formations and categories.

Train equipment

7.2.4.2 The section relating to Train equipment shall provide a basic description, with diagrams and charts of all systems and items of equipment on the Trains, on an individual system/equipment basis, in the degree of detail likely to be needed and understood by Train Operators. The location, purpose and functions of all switches, cocks, cut-outs, controls and MCBs shall be clearly shown.

Cab equipment

7.2.4.3 The section relating to cab equipment shall describe and illustrate the location, purpose and functions of all controls, switches, visual indications, communications equipment and other items in the cab.

Operation of cab controls

7.2.4.4 The section relating to operation of cab controls shall detail the operating sequence of cab switches and controls needed to operate the Train before entry into, during and after withdrawal from, service and shall be prepared in consultation with the Project Manager.

Coupling and Uncoupling

7.2.4.5 The section relating to coupling and uncoupling shall describe and illustrate the automatic coupling equipment and its controls, and to detail procedures for coupling and uncoupling, and use, if appropriate, of the emergency coupler.

Miscellaneous information

7.2.4.6 The section relating to miscellaneous information shall be used to supply basic Train information not dealt with elsewhere, e.g. weights, dimensions, operating pressures.

Operator's Handbook

7.3.1 Eight hundred copies of the Operator's Handbook shall be provided and shall be prepared in close consultation with the Project Manager.

7.3.2 The purpose of the Operator's Handbook is to act as an aid to the Train Operator in the measures necessary to overcome faults on the Trains when in operation, so that the Train may be either returned to/retained in Passenger service or

moved to a point where appropriate technical assistance is available. The Operator's Handbook shall complement the trainborne diagnostic system and shall include flowcharts for fault identification by logical elimination until the defect is isolated and movement of the Train can be undertaken safely.

Principal Operating Faults

7.3.3 The most serious faults likely to be met under operating conditions are:

- (a) door defects;
- (b) loss of traction power;
- (c) sudden emergency braking;
- (d) failure of brakes to release or apply;
- (e) loss of air pressure; and
- (f) major control system failure.

Information needed by Train Operators

7.3.4.1 In the event of a fault occurring, the trainborne diagnostic system will present the Train Operator with an indication of the general nature of the fault, and in some cases the method of overcoming it. Information in the Operator's Handbook shall be laid out under the following headings:

- (a) symptom;
- (b) possible faults;
- (c) likely cause(s);
- (d) method of identifying defect precisely;

- (e) method of overcoming defect so that a Train can be moved in accordance with Company's Rule Book.

7.3.4.2 Information supplied for the Train Operators must not specify work which can only be undertaken by maintenance personnel or which requires workshop or Depot facilities. The degree or expertise required shall be limited to operating isolating cocks and switches, resetting MCBs, replacing fuses and similar elementary procedures which can be carried out from inside the Train.

Presentation of information

7.3.5 Information shall be presented on a hierarchical basis leading from the symptom. Simplified diagrams and flowcharts shall be provided as necessary to aid understanding. The complete Operator's Handbook shall be printed in A5 format, securely bound in a manner allowing easy updating.

Breakdown Manuals

7.4.1 The Contractor shall supply and maintain for the Contract Duration full technical and full procedural information which shall enable the Company's breakdown department to recover a Train which cannot be driven under its own power or with the use of an assisting train (e.g. a Push-Out or Push Through) in a safe manner, in the least amount of time and to keep reclamation damage to a minimum.

7.4.2 The breakdown manual shall be produced in close consultation with the Project Manager.

7.4.3 Fifteen controlled copies of the breakdown manual shall be provided. They shall be printed in A4 format, securely bound in a manner which allows easy updating.

Training Manuals (Trackside Equipment)

7.5.1 The Contractor shall propose a comprehensive training scheme to provide the Company Employees with theoretical instruction and in depth hands-on experience of operation of all the Trackside Equipment.

7.5.2 The Contractor shall submit details of training courses available at the Contractor's or sub-contractor's works, duration of courses, location, minimum number of personnel who can be accommodated on each course and booking lead times required.

7.5.3 The Contractor shall advise the follow-up training which it recommends to be conducted on-site, on completion of the equipment installation and testing phase.

Enhanced Existing VHF Train Radio Operator's Handbook

7.6.1 Eight hundred copies of the Operator's handbook for the Enhanced Existing VHF Train Radio shall be provided and prepared in close consultation with the Project Manager.

7.6.2 The purpose of the Operator's handbook for the Enhanced Existing VHF Train Radio is to describe to the Train Operator how to operate the Enhanced Existing VHF Train Radio system, in particular, highlighting any differences from the existing system, both in terms of controls and indications.

7.6.3 The Operator's handbook for the Enhanced Existing VHF Train Radio shall be printed in A5 format so that it can be incorporated into the Operator's Handbook.

Northern Line Main Control Centre Staff's Handbook

7.7.1 Eighty copies of the staff handbook for the Northern Line Main Control Centre shall be prepared in close consultation with the Project Manager.

7.7.2 The purpose of such handbook is to describe to the staff in the Northern Line Main Control Centre how to operate the Existing Enhanced VHF Train Radio system, in particular, highlighting any differences from the existing system, both in terms of controls and indications.

7.7.3 Such handbook shall be printed in A4 format.

Final UHF Trunked Radio Operator's Manual

7.8.1 The Operator's manual for the Final UHF Trunked Radio shall be prepared in close consultation with the Project Manager.

7.8.2 Two hundred controlled copies of such manual shall be supplied.

7.8.3 Such manual shall be printed in A4 format, securely bound in a manner to allow easy updating.

7.8.4 Such manual shall be a reference document which shall enable the Northern Line Main Control Centre Staff and Operators to understand and operate the Final UHF Trunked Radio.

7.8.5 Such manual shall be prepared to such a standard that it may be used extensively by the Company's or LUL's training instructors in the delivery of training to Operators.

7.8.6 Such manual shall be divided into sections to meet the requirements of each individual user group as described in Schedule 6, Part C, section 4.2.

Final UHF Trunked Radio Operator's Handbook

7.9.1 One thousand copies of the Operator's handbook for the Final UHF Trunked Radio shall be provided and shall be prepared in close consultation with the Project Manager.

7.9.2 The purpose of such handbook is to act as an aid to the Operators and the other user groups identified in Schedule 6, Part C, section 4 in the use of the Final UHF Trunked Radio.

7.9.3 Such handbook shall be printed in A5 format securely bound in a manner which allows easy updating. Such handbook shall be capable of being incorporated into the Operator's Handbook.

TECHNICAL DOCUMENTATION

AS-BUILT DRAWINGS FOR TRAINS, TRACKSIDE EQUIPMENT AND ENABLING WORKS

General

8.1.1.1 The Contractor shall provide as-built drawings of the Trains, Trackside Equipment and Enabling Works. The first draft of the as-built drawings for the Trains shall be provided to the Company by the Documentation Target Delivery Date therefor. As-built installation drawings in respect of the Trackside Equipment shall be provided to the Company by the Documentation Target Delivery Date therefor. The first draft and final as-built installation drawings of the Enabling Works shall be provided in accordance with the dates specified in Schedule 5. Final 'as-built' drawings of the Trains shall be provided by the Documentation Target Delivery Date therefor.

8.1.1.2 The list of drawings to be submitted is subject to the prior approval of the Project Manager. The drawings to be submitted shall include all the drawings submitted in the design submission stage and any others as deemed necessary by the Project Manager. Four paper prints and two copies of each print electronically stored on floppy disk or other storage medium subject to agreement with the Project Manager shall be provided.

8.1.2 Drawings for Installations of the Trackside Equipment

8.1.2.1 Prior to commencement of the installation, the Contractor shall supply the Project Manager with Site installation drawings arranged in a Site pack for each location. These drawings will be used by the Company's site representatives to verify details of the system installation.

8.1.2.2 The Contractor shall submit a final set of documentation raised to as-built status. With regard to the site installation drawings the Contractor shall mark-up the master copy of each Site pack and agree the contents with the Project Manager prior to the final up-date.

8.1.2.3 The Contractor shall provide suitable plan view drawings showing equipment and cable installation details from information established from the Site survey work.

8.1.2.4 All cable runs shall be documented to the extent of identifying the location of the cable and any associated equipment on the existing cable routes running throughout the Northern Line.

8.1.2.5 The cable joints and track mounted equipment installation shall be fully documented.

8.1.2.6 All documents and drawings shall be collated within a Documentation manual arranged sequentially with regard to document categories and assembled on an individual Site basis.

8.1.3 As-Built Drawings for Installations of the Enabling Works

8.1.3.1 The Contractor shall supply the Project Manager with Site construction drawings arranged in a Site pack for each location. These drawings will be used by the Company's site representatives to verify details of the system installation.

8.1.3.2 The Contractor shall submit a final set of documentation raised to as-built status. With regard to the site construction drawings the Contractor shall mark-up the master copy of each Site pack to show details of variations to the structures and agree the contents with the Project Manager prior to the final up-date. Drawings showing openings and strengthening to the existing structures shall be included.

8.1.3.3 The Contractor shall provide suitable plan view drawings showing the trackwork installation raised to as-built status.

8.1.3.4 Services Drawings

8.1.3.4.1 All service runs (above and below ground) shall be documented to the extent of identifying the location of the services and any associated equipment on new and existing routes running throughout the depots. The outline of adjacent buried foundations shall be shown next to routes of buried services. The sizes and inverts of drains shall be shown.

8.1.3.4.2 The documentation for power and electrical systems and equipment shall confirm to the requirements of PEE-STD-01-008-A1.

8.1.3.4.3 As-built documentation for building services equipment shall include installation drawings, operation and maintenance manuals. The installation drawings shall give details of the equipment and as constructed systems. The operations manuals shall define the operations and control of each system giving the design requirements and settings of the equipment. The maintenance manuals shall include manufacturers' details of equipment and necessary maintenance operations during the normal working life of the systems. This will include recommended inspections necessary to ensure the proper operation of the equipment and systems.

8.1.3.4.5 All documents and drawings shall be collated within a Documentation manual arranged sequentially with regard to document categories and assembled on an individual Site basis.

8.2 TECHNICAL DATA BOOK AND SYSTEMS MANUALS

Technical Data Book (Trains)

8.2.1.1 The Contractor shall provide technical data book in A4 size which shall include as a minimum, but not be limited to, the following details:

- (a) full technical parameters of the Trains, its sub-systems and its line replaceable equipment;
- (b) a full index to the technical data book in illustrated/diagrammatic form;
- (c) a complete colour photographic reference, with brief descriptions, of the Trains.

8.2.1.2 The layout and full contents of the document shall be agreed with the Project Manager.

8.2.1.3 The document shall be provided in an updateable format with a robust binding which allows quick and easy replacement of pages.

8.2.1.4 An example copy of a draft (but not yet complete) technical data book will be made available to the Company upon request.

8.2.1.5 The Contractor shall supply ten copies of the agreed technical databook in hard copy format and two updateable master copies of it, in a form to be agreed with the Project Manager, within a period to be agreed with the Project Manager.

Systems Manual (Equipment)

8.2.2 The systems manual shall describe the overall system as installed at Site and in the Depot and shall include the following details:

- (a) system description;
- (b) equipment operation;
- (c) equipment location;
- (d) housing;
- (e) cable routing;
- (f) mechanical infrastructure;
- (g) equipment design;
- (h) equipment facilities;
- (i) performance;
- (j) expansion;
- (k) power distribution;
- (l) earthing;
- (m) interfaces;
- (n) compliance with LUL's Fire Code of Practice For Materials Used in the Underground;
- (o) cable design;
- (p) block schematic diagrams;

(q) inventory of materials lists.

Electronic Hardware Documentation

8.3 The Contractor shall supply circuit descriptions, schematics, layouts and parts lists of printed circuit boards and test specifications.