1.0 GENERAL

1.1 SCOPE

1.1.1 This section of the Specification describes and specifies requirements for the supply, delivery, installation, testing, commissioning and handing over in approved working order and maintenance during the Defects Liability Period of the whole Fireman Intercom System in accordance with Conditions of Contracts, Bill of Quantities, Drawings and other related documents.

1.2 TECHNICAL PARTICULARS

1.2.1 Tenderers shall submit at the time of tendering all catalogues, detailed technical particulars and guarantees in respect of the equipment offered. The tenderers shall bind all these documents. No departure from these technical particulars and guarantees shall be permitted except with the written approval of the Superintendent Officer (S.O) or S.O's Representative.

1.3 GUARANTEES

1.3.1 The Tenderers shall guarantee all equipment to be supplied under this contract against faulty design, materials and workmanship at the manufacturer's works within the defect liability period (DLP).

1.4 ELECTRICAL SYSTEM

1.4.1 All equipment shall be rated for operation on a 230/400 V (within the tolerance as defined in MS IEC 60038; 230/400 V, +10%, -6%), 3 phase, 4 wire, 50 Hz system with solidly earthed neutral.

2.0 DESCRIPTION

2.1 SYSTEM DESCRIPTION

2.1.1 The system generally consists of the following components:-

2.1.1.1 Main panel

2.1.1.2 Remote telephone terminal unit (RTTU)

2.1.1.3 Remote handset panel (RHP)

3.0 EQUIPMENT

3.1 MAIN PANEL

3.1.1 The main panel is used to monitor the overall status of the fireman intercom system. It shall consist of system status / indicator panel, master handset and remote handset status / indicator panel. They shall be enclosed in a panel enclosure constructed from epoxy dry powder and oven baked semi-gloss red colour electrogalvanised sheet steel.

3.1.2 The main panel shall capable of self-supervising by checking system status, detecting broken link, shorted cable and remote handset removal. It shall come with the required power supply unit, input/output cards and other necessary accessories required for its complete system and operation.

3.1.3 The system status/indicator panel shall comply with the following minimum technical specifications:

Type	:	Microprocessor based
Panel construction	:	Aluminium
Battery	:	24V dc, 10 AH
Charger	:	Built-in
Meter	:	DC voltmeter
LED indicators	:	Mains (A/C) on; Mains (A/C) fail; DC/battery on; DC/battery fail; Charger fail; Auto mode; System fault
Audible alert	:	Buzzer
Interface/selection	:	Keyboard with 16 keys and 16 x 1 character LCD display

3.1.4 The master handset panel consists of a handset and metal enclosure. It shall comply with the following minimum technical specifications:

Panel enclosure	:	Aluminium
Handset construction	:	High impact plastic in red colour
Rating	:	24V dc
Ear-piece	:	Built-in handset loudspeaker
Mouth-piece	:	Condenser microphone
Features	:	Two-way simultaneous conversation

3.1.5 The remote handset status/indicator panel is used to monitor the status of each remote handset using its built-in supervisory circuit. It shall comply with the following minimum technical specifications:

Panel construction	:	Aluminium
Rating	:	24V dc
Remote handset status	:	10 or 20 nos per panel
Status indicators LED	:	Call; Fault
Label	:	Each remote handset identification is to be tagged on the panel using printed self-adhesive label.

3.2 REMOTE TELEPHONE TERMINAL UNIT (RTTU)

3.2.1 The RTTU shall comply with the following minimum technical specifications:

Panel enclosure	:	Epoxy dry powder and oven baked semi-gloss red colour electrogalvanised sheet steel
Rating	:	24V dc
Support capacity	:	10 remote handsets

3.3 REMOTE HANDSET PANEL (RHP)

3.3.1 The RHP consists of a handset and mild steel sheet enclosure. It shall comply with the following minimum technical specifications:

Panel enclosure	:	Epoxy dry powder and oven baked semi-gloss red colour electrogalvanised sheet steel; With break glass and key lock
Handset construction	:	High impact plastic in red colour
Rating	:	24V dc
Ear-piece	:	Built-in handset loudspeaker
Mouth-piece	:	Condenser microphone
Features	:	Two-way simultaneous conversation; Lifting of RHP will automatically establish a link with the master handset

4.0 WIRING

4.1 GENERAL

4.1.1 General system of wiring, conduits, trunking, cable tray or cable ladder, wiring accessories etc. shall be referred to the latest JKR Specification for Low Voltage Internal Electrical Installation (L-S1).

4.2 SERVICE COLOUR IDENTIFICATION

4.2.1 All galvanised steel (GS) conduits and electrogalvanised sheet steel (EGSS) trunking for the system shall be clearly identified and distinguished from other services.

4.2.2 EGSS trunking for the fireman intercom system shall be identified using black “INTERCOM” letterings over white background. The letterings shall have a minimum height of 15 mm but need not exceed 50 mm, and at an interval not more than 5000 mm and at any bends. All letterings shall be clearly legible, and to the satisfaction of the S.O or S.O’s Representative.

4.2.3 Colour bands for GS conduits identification shall be as specified in the latest JKR Specification for Low Voltage Internal Electrical Installation (L-S1) or as approved by the S.O or S.O’s Representative.

4.3 CABLE

4.3.1 Cables to the RHP shall be using 2 x 2.5 sq.mm PVC insulated 7 strands copper conductor in GS conduit or EGSS trunking.

4.3.2 The RTTU shall be connected to the main panel using the following cables in GS conduit or EGSS trunking:-

4.3.2.1 Speech line using 2 x 2.5 sq.mm PVC insulated 7 strands copper conductor;

4.3.2.2 RTTU power using 2 x 4.0 sq.mm PVC insulated 7 strands copper conductor; and

4.3.2.3 Cables for data transmission shall be using 2 nos 24 AWG screened twisted pair stranded copper conductor.

5.0 TESTING AND COMMISSIONING

5.1 TEST INSTRUMENTS

5.1.1 All measuring and test instruments used for testing and commissioning of the installations shall be regularly tested and calibrated by the manufacturers or accredited calibration laboratories for their functionality and accuracy. Test and Calibration Reports or Certificates for the measuring and test instruments issued by the calibration laboratory shall be valid for two (2) years from the date of issuance.

5.1.2 The instruments and their Test and Calibration Reports or Certificates shall be submitted to S.O or S.O's Representative for verification two (2) weeks before testing of the installations being carried out. No test on the installations shall be carried out without prior approval of the S.O or S.O's Representative. Notwithstanding the validity of the aforesaid Reports or Certificates the measuring and test instruments shall be re-calibrated if so required by the S.O or S.O's Representative after any mechanical or electrical mishandling. Fee required for the testing and calibrating of the measuring and test instruments is deemed to be included in the Contract.

5.2 TEST AND TEST CERTIFICATES

5.2.1 After the installation work has been completed and before Certificate of Practical Completion is issued, the whole system shall be tested for compliance and performance as follows:-

5.2.1.1 Cables shall be tested for continuity;

5.2.1.2 Functional test to indicate correct operation and performance of all equipment; and

5.2.1.3 Any other tests which may be needed to demonstrate the satisfactory function of the system

5.2.2 The S.O or S.O's Representative reserves the right to be present at all tests and the Contractor shall give at least one (1) week notice in writing to the S.O or S.O's Representative for this purpose. In any case, no test shall be carried out without prior approval of the S.O or S.O's Representative. Copies of all the test certificates together with As-Installed Drawings properly bound and titled shall be submitted to the S.O or S.O's Representative within one (1) week after the completion of the testing.

6.0 SERVICE AND MAINTENANCE

6.1 During the Defects Liability Period, the Contractor shall be responsible for the service and maintenance work of the complete installation. All works shall be carried out by skilled person. All labour, material, tools and parts necessary to rectify the defect due to manufacturing/installation faults shall be supplied/executed at the Contractor's cost.

6.2 The service and maintenance to be performed and defects to be rectified and making good shall include but not limited to the following:-

6.2.1 Repairs and replacement of all equipment and accessories that become faulty due to manufacturing and installation defects whether it is under the manufacturer’s warranty or not;

6.2.2 Replacement and making goods of all wiring and accessories;

6.2.3 Making good any damage to roads, buildings, drains, cables, pipes, concrete areas, paved areas etc. which had not been properly made good arising out of his work; and

6.2.4 All other works deemed as necessary by the S.O or S.O’s Representative.

6.3 All works shall be carried out as soon as the Contractor is being informed by the S.O or S.O’s Representative or the occupant, and shall be completed within a reasonable time except under emergency situation. If the Contractor fails to comply with the above requirements, the S.O or S.O’s Representative reserves the right to engage another party to carry out the work, in which case, the Contractor shall be responsible for all the expenses incurred.

7.0 SHOP DRAWINGS AND AS BUILT DOCUMENTS

7.1 SHOP DRAWINGS

7.1.1 Two (2) sets of prints of shop drawings for construction and/or installation shall be submitted to the S.O or S.O's Representative for approval. The Contractor shall prepare and submit shop drawings for the whole work or parts of the work at least two (2) weeks before the work begins. If the shop drawings submitted are not acceptable by the S.O or S.O's Representative, the Contractor shall amend and re-submit the shop drawings within two weeks from the date of return of the shop drawings. No work shall be carried out without the shop drawings being approved by the S.O or S.O's Representative.

7.1.2 The shop drawings shall include and show the following:-

7.1.2.1 Co-ordinated dimensioned general arrangements, layouts and positions of accessories, equipment racks and all others necessary for the complete installation;

7.1.2.2 Schematic line diagrams of the installation;

7.1.2.3 The dimensioned general arrangements, layouts and routes of final circuits;

7.1.2.4 The dimensioned general arrangements, layouts, routes and positions of all lateral and vertical mains and/or sub-mains;

7.1.2.5 The dimensioned layouts and positions of all holes and cut-through in the walls and floors for the lateral and vertical mains and/or sub-mains; and

7.1.2.6 Co-ordinated routes for all cables laid external of the building;

7.1.3 The cost of all these shop drawings is deemed to be included in the Contract.

7.2 AS BUILT DOCUMENTS

7.2.1 As built document shall consist of but not limited to the as installed drawings, manuals, certificates, catalogues, inventories and parts lists.

7.2.2 The as installed drawings shall comprise of:-

7.2.2.1 Site plan;

7.2.2.2 External cable routes;

7.2.2.3 Internal layout plans; and

7.2.2.4 Schematic diagrams.

7.2.3 These drawings shall be labelled at the lower right hand corner with the Electrical Contractor's name and address, date of commissioning, scale, drawing number (the drawing number to be obtained from the S.O or S.O's Representative), title and following particulars: -

JABATAN KERJA RAYA
CAWANGAN KEJURUTERAAN ELEKTRIK
CONTRACT NO.:

7.2.4 If the drawings submitted are not according to the actual installation at site and/or not acceptable to the S.O or S.O's Representative, the Contractor shall amend and re-submit the drawings within two (2) weeks from the date of return of the drawings to the satisfaction of the S.O or S.O's Representative.

7.2.5 Manual and documents for the installation shall be supplied. It shall comprise of:-

7.5.1.1 Installation manual;

7.5.1.2 Operation manual;

7.5.1.3 Service and maintenance manual;

7.5.1.4 Inventories list;

7.5.1.5 Product data and catalogue;

7.5.1.6 Warranty certificates; and

7.5.1.7 Installation test results.

7.2.6 Each of the as built documents shall be bound together with hard cover and submitted in minimum four (4) sets upon issuance of Certificate of Practical Completion of the project.

7.2.7 In addition, one (1) set of the as installed drawing shall be submitted in the form of original document, and four (4) sets in physical digital storage.

7.2.8 The cost of all these prints, manuals, tools etc. whether or not provided in the Bill of Quantities, is deemed to be included in the Contract.