Robell
CONTROL
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HVAC CONTROL PANELS AND SYSTEMS, BEMS SYSTEMS - ELECTRICAL INSTALLATION

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FAO Kevin Flint

30 April 2013

Dear Sirs,

Re: P04-01 Stourbridge Lions Medical Centre

Thank you for the opportunity to offer our quotation for the above project.

Our quotation is a budget based quotation and based upon the following information received:

Arcobaleno performance specification
Arcobaleno drawings:
ABS-12-003-00-55-01, 56-02, 57-03, ABS-12-003-01-55-02, 56-02, 57-02
ABS-12-003-02-55-03, 56-03, 57-03

To supply, install and commission BMS, Form 2 control panels and associated field control devices.

**£56,570.00 ex vat**

Notes and assumptions made during this quotation:

- We have not allowed for the supply of the gas or water meters. We have allowed for the connection and commissioning of the gas and water meters on the BMS. It assumed that the meters are situated inside the building.
- Electrical Meters: LV Distribution boards:- We have assumed that the electrical meters are all of the Modbus type and are supplied by others. We have allowed to connect to a point on the Modbus meter network installed by the Electrical/IT contractor. It is assumed all addressing and commissioning of the meters shall be performed by others. We have allowed 16 No's network connections for the electrical metering Modbus
- We have allowed for 1 number control panel for the control of the LTWH and ventilation systems as follows:
- Main boiler house plant.
- We have assumed full control of the 2 numbers air handling units for general areas and minor surgery areas and have allowed for inverters for the fans based on 3kW at tender stage.
- Trend Synapsis interface to the Daikin VRV system
- 2 number WC extract systems.
- Overdoor air curtain, we have assumed power by others but have allowed for the valve operation via reception wall temperature sensor.

- We have allowed for a front end supervisor as per the specification.

**Overview**

The control panels shall be manufactured to Form 2 type 2 construction.

The Trend IQ3 Building Management System (BMS) shall provide the control and monitoring functions of the LPHW, heating and ventilation systems within

The BMS controllers can utilise Ethernet for the communications network. The BMS controllers shall provide the user with web pages that can be accessed using a web browser, either locally or over Ethernet, to view actual or logged parameters and modify settings.

The network of outstations shall be connected to a BMS supervisor providing the user with a Windows based operating system using spreadsheets and databases to collate information from the outstations relevant to the efficient use of the plant.

The BMS supervisor shall also be provided with a 19 inch FST monitor to allow graphical representation of plant status, performance and a printer to register plant alarms.

The BMS shall comprise of a proprietary network of stand-alone integrated DDC controllers (outstations) located in each MCP.

The system includes all necessary software, hardware, operator input / output interfaces, sensors and modulating devices required for the complete operation of the mechanical building services plant.

The operating software installed within the outstations and made available on the supervisor terminal shall enable a competent operator, via a security code, access to the following information and functions: -

| | |
|---|---|
| Alarm Status | Indication of plant fault or temperature alarms. An Alarm shall indicate the status of each alarm active or Inactive to be reset via simple acknowledgement commands. |
| Control Functionsa) | a) Proportional, Integral and Derivative control of analogue devices<br>b) Self-adaptive optimum start and stop<br>c) Plant protection during shutdown.<br>d) Sequential plant starting.<br>e) Load cycling.<br>f) Energy efficient plant schedules. |
| Measured Values | All input and output measurements, analogue or digital shall be provided with identification labels and utilised for monitoring purposes. |
| Time Clock Control | View or change selected plant operating schedules manual operation and date exemption programs. The operator shall have the facility to start or stop individual items of plant from the operator terminal. |
| Set point Adjustment | View and adjust selected set points and parameters from on screen menus. |

| | |
|---|---|
| Event Logging | Interval and time span user-defined logs shall be generated from data on the network. |
| Totalisation | Plant run time totalisation inclusive of run time limits with alarm generation outside of normal parameters. Hours run data shall be capable of being collected on a database of common format capable of being exported to Microsoft Excel or a PPM software package. |
| Graphics | Dynamic colour graphics shall be generated on the remote terminal to represent schematically the plant installed, displaying set points, measured values, overriding facilities and alarms. |

**Trend BMS Front End Supervisor**

The site BMS supervisor terminal should be a Pentium machine or compatible, and be capable of running Windows XP Professional with the following minimum configuration: -

P4 2.0 GHz CPU
120 Gb Hard disk
2 Gb RAM
1280 x 1024 Graphics Card with 128Mb
1280 x 1024 19-inch LCD Colour Monitor
4 USB x Ports
Colour Printer for Graphics and Reports
2 x Comms Ports
1 x Ethernet Network Card
2 x PCI Expansion Slots
Mouse & Keyboard
Windows XP Professional
52 x CD with R/W

**Control Panels**

The power section of each MCP contains the power distribution and switchgear for the mechanical services plant listed in the specification.

A door interlocked isolator is provided for isolation of all power circuits in order to enable safe maintenance and access with the exception of fused power supplies for the fire alarm interlock relay, BMS outstation and any gas solenoid valves which shall all be separately fused and shrouded.

The panel is provided with panel live and control circuit healthy lamps.

The power section door of each panel shall be provided with plant over-ride selector switches and plant status indicators.

A lamp test facility is provided to allow all lamps to have their operation confirmed.
The control section will contain the programmable outstations, all necessary input and output modules in order to fulfil the requirements relating to the operation of the mechanical services plant.

The programmable outstations shall be provided with a RG45 connection for a laptop in the control section of each MCP in order to provide local interrogation of the BMS functions.

Allowance has been made for the following: -

1. Electrical installation of power, control and network associated with our control system to the 17th Edition IEE regulations.

2. Primary containment within plant room areas and secondary containment to mechanical services plant on the floors. The secondary containment shall be taken from existing containment in corridors and risers throughout the building provided by the electrical contractor.

3. Gas valve and safety devices within plant rooms.

4. Access equipment to meet the installation requirement.

5. Identification of devices, cables and isolators.

6. Project management shall be conducted to meet the requirements of the project programme. We shall attend regular site meetings in order to co-ordinate and co-operate with other site trades to bring about a timely satisfactory completion to the project.

7. Demonstration of controls on completion.

8. Training in the operation of the controls system.

9. Operating and maintenance instructions in AutoCAD, Word and PDF Files.

10. Valve bodies and linkages.

11. Separate power supplies for the fire alarm interlocks.

<u>No allowance has been made for the following: -</u>

1. Any builders work over 50mm (We have allowed to mark chases).

2. Electrical installation associated with general extract fans, water heaters or heat recovery units not fed from the Robell control panel.

3. Electrical supply cables to control panels and direct supplied packaged plant.

4. Electrical supply cables from control devices to control panels relating direct supplied packaged plant.

5. Removal and disposal of redundant equipment.

6. Replacement of thermal installation.

7. Off loading, cranage, hoisting, positioning of equipment.

8. Any out of hours working.

9. Fitting of any pipe work devices (e.g. pockets & valves etc).

10. Commissioning of any equipment not supplied by Robell Controls.

11. Any electrical installation of power supplies to mechanical plant supplied by distribution boards.

12. Any Equipotential Earth Bonding we assume that this is in the Electrical Installation and testing package

13. Any surge protection, we assume this is in the Electrical Installation and Testing Package

14. Pump Inverters.

Please note Robell payment terms 30 days unless otherwise agreed; full terms and conditions available on request

We trust this information meets with your requirements. Any questions please do not hesitate to contact the writer.

Yours Faithfully
For Robell Control Systems Ltd

Mike Everell
Managing Director
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**This quotation is open for 30 days and is based on Robell Control Systems Limited Standard Terms and Conditions of Sale**