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24 DOCUMENTATION FORMAT

24.1 GENERAL

24.1.1 Scope

1 This Part specifies the general requirements and standards required for the compilation of paper and electronic documents.

2 Related Parts and Sections are as follows:

Section 1	Part 7
Section 1	Part 21
Section 21	Part 1
Section 21	Part 23

24.1.2 General Requirements

1 Documents will be presented both electronically and on paper. Documents from an electronic source shall, when printed, conform to the requirements for documents presented on paper. The number of hardcopy manuals shall be determined by the contract documentation.

2 The final approved documentation shall be reproducible in the following sizes. These sizes are defined to ensure that the provided documentation can be easily read and understood.

(a) A4 size paper for manuals

(b) A3 size for system diagrams

(c) A1 size for instrument location and plant drawings

24.1.3 Document format

1 Drawings shall be compiled in AutoCAD DWG or Microstation DGN file format or similar approved with Engineer. Word processed documentation should be presented in Adobe Acrobat PDF format or similar approved with Engineer. Scanned copies of the ‘as built’ drawings showing all of the required approval signatures and official stamps shall be provided in TIFF format. The files should be presented on optical disc containing a readme.txt file containing an index of the disk.

24.1.4 Time Scale

1 The time scale for delivery of manuals shall be as stated in the contract documentation, with the final versions of the manuals being available before hand over.

24.1.5 Approval

1 During the construction phase of the project, the drawing and manuals status shall be monitored and discussed. These discussions form part of the project meetings / site meetings and are part of the approval process. All documents shall be approved prior to hand over.

24.1.6 Record Drawings

1 This specification defines the production of drawings so they are provided in a consistent way that shall make the drawings easy to use. This section refers to record drawings that relate to the as built product. Documents from an electronic source shall, when printed, conform to the requirements for documents presented on paper.

24.1.7 As-Built Drawings

1 Drawings produced by suppliers/Vendors shall be of appropriate size as below. Documents from an electronic source shall, when printed, conform to the requirements for documents presented on paper.

2 Drawing information shall be handed over in 'As Constructed' form and marked-up accordingly in the information panel.

24.1.8 Scales

1 As few scales as possible shall be used and each scale used shall be recorded in the title panel. The scale shall be large enough to permit easy and clear interpretation of the information and ensure clarity of prints of all sizes reproduced. The recommended scales are listed in Table 24.1.

Table 24.1
Scale Recommendations

Category	Recommended ratios of scale		
Enlargement Scale	50:1 5:1	20:1 2:1	10:1
Full Size			1:1
Reduction Scale	1:2 1:20 1:200 1:2000	1:5 1:50 1:500 1:5000	1:10 1:100 1:1000 1:10000

24.1.9 Scale Bar

1 The original scale shall be indicated by means of a relevant numbered scale bar. A warning against scaling the drawing shall be given.

24.1.10 Presentation of Drawings

1 Title panel and information panel shall contain the following information:-

(a) client

(b) contractor

(c) supervisory consultant

(d) designer/manufacturer

(e) project title

(f) name of site/s

(g) name and type of installation/s

(h) drawing title/description

(i) sheet number in the series

(j) drawing status

(k) identity of persons carrying out the draughting and checking

(l) date of drawing

(m) drawing scale/s

(n) drawing no. with provision for revision suffix (Year/Contract/Number/ /Revision)

(o) contents of information panel

(p) The nature and date of each revision and the identification of the person approving it shall be recorded in the information panel, starting next to the title panel. General notes shall commence at the opposite end of the information panel

2 All text and drawings shall be in black unless otherwise stated.

3 Amendment of Drawings

(a) After receipt by the Client of (draft) 'As Constructed' drawings, the Contractor shall notify the Client of any changes by re-issuing a complete draft, with further revision suffix to title and information panel.

(b) Each section shall clearly indicate the status of the information in the form of amendment notes.

4 4 Electrical Schematics

(a) Electrical schematics shall be complete with cross references for all contact elements of all components used.

(b) The legend for naming and symbols used shall be clearly displayed on the drawing.

24.1.11 Manuals

1 A contents page shall be provided for each Volume listing the contents of that particular Volume. It shall be entitled “Contents of Volume No XXX”. Where there are two or more volumes to a manual then there shall be a complete index to the set of volumes with each Volume.

2 The manual(s) shall be formed containing operational information in the first part of the manual and maintenance information in the latter part.

3 The manual shall be split into the following sections:

(a) Section 1.0 - Introduction

(i) The introduction shall describe the purpose of the operating manual. This shall include how to start up and shut down the installation and/or process and/or plant as appropriate and maintain it at its optimum performance. The following details shall be included in the body of the manual.

(b) Section 2.0 - Technical Description

(i) process descriptions

(ii) plant description

(iii) schedule of equipment commencing with a complete data sheet specific to the equipment used detailing Make, Type or Model No.. Rating, Order No., Quantity used etc.

(iv) Product Catalogues, Specifications & Data Sheets

(v) Material Schedule

(vi) Calculations of various equipment's like Lighting, Load etc.,

(c) Section 3.0 - Safety

(i) safety precautions

(ii) hazardous area zoning

(iii) confined spaces

(iv) emergency procedures

(v) site security description

(vi) warning labels, etc

(d) Section 4.0 - Operating Information

(i) plant settings

(ii) operating procedure

(iii) start up/shut down/power failure

(iv) routine check procedure

(v) replacement of consumable items

(e) Section 5.0 - Control Philosophy

Functional Design Specification (FDS) to include the following as minimum:-

(i) description of mechanical plant

(ii) description of electrical plant

(iii) description of instrumentation, control and field devices

(iv) process & instrumentation diagrams (P&ID's)

(v) plant start up sequence for both manual and automatic mode

(vi) plant shut down sequence for both manual and automatic mode

(vii) power fail and restart sequences

(viii) normal process sequences

(f) Section 6.0 - Maintenance Instructions including:-

(i) safety precautions

(ii) routine maintenance schedules

(iii) spare parts listing and agreed spares list

(iv) lubrication

(v) plant strip down/assembly

(vi) fault finding instructions

(vii) Maintenance Checklists (preventive, corrective & predictive)

(g) Section 7.0 - Suppliers

(i) Supplier's/Vendor's names, contact person and his title, addresses and telephone numbers, email etc.

(h) Section 8.0 - Drawings and Records

(i) plant drawings

(ii) electrical diagrams

(iii) cable schedules

(iv) valve schedules

(v) instrument loop diagram

(vi) vendor manuals (original manuals only-photocopies shall not be acceptable)

(vii) vendor test certificates

(viii) instrumentation loop test certificates

(ix) plant description forms

(x) hazardous area zoning drawings

(xi) a general description of each plant and how it operates, shall be included at the beginning of each of the M&E sections. The description shall explain the function of the equipment. It shall be sufficiently detailed to enable the reader to understand how the works operates before using the operating instructions.

(xii) a complete set of data sheets providing specific details of the equipment used with Order No., Serial No., and specific technical details etc. If a comprehensive spare parts list is not attached to the individual equipment catalogue section, the same shall be compiled by the Contractor and attached to this section.

(xiii) a complete list of all components used for Order No., Motor Control Centres detailing Make, Model No., Rating, Quantity used etc.

(xiv) Material Submittals and Document Submittals

(xv) FAT Records

(xvi) On-Site Installation, Testing & Commissioning Reports

(xvii) Warranty Certificates

24.1.12 Instrumentation Documentation

1 The instrumentation documentation shall be according to the following specification.

(a) For the instrumentation the contractor shall supply the following information:

(i) instrument loop diagrams

(ii) manufactures literature

(iii) certificate of calibration

(iv) certificate of conformity

(b) RTU Documentation

For the RTU system, the contractor shall supply the following information:

(i) RTU I/O schedules

(ii) GA and wiring diagram

(iii) isagraph program (disk)

(iv) RTU configuration (disk)

(v) RTU user manual

(vi) RTU programming software user manual

(vii) licensed and latest version of the programming software original with all end user license agreements.

(c) PLC Documentation

For the PLC system, the contractor shall supply the following information:-

(i) system architecture drawing

(ii) rack layouts

(iii) PLC I/O schedules (printed sheet + Excel format disc)

(iv) PLC memory map

(v) PLC hardware listing

(vi) annotated PLC ladder logic (printed sheet + disc)

(vii) PLC user manual

(viii) PLC programming software user manual

(ix) licensed and latest version of the PLC programming software original with all end user license agreements.

(d) HMI Documentation

For the Man Machine Interfaces, the contractor shall supply the following information: -

(i) system architecture drawing

(ii) graphic copy and description of all mimics

(iii) description of all trends

(iv) alarm handling and schedules

(v) operator control functions

(vi) HMI database listing with disc, if applicable

(e) SCADA Documentation

For the SCADA system, the contractor shall supply the following information:

(i) system architecture drawing

(ii) software user manuals

(iii) SCADA database listing and discs

(iv) alarm handling and schedules

(v) description of all trends

(vi) graphic copy and description of all mimics

(vii) database point allocation table (disk

(viii) application software source code

(ix) SCADA latest version of the programming software and IO Drivers with all end user license agreements.

END OF PART