O&M Manual Checklist

Job Title: W26-048: Air Conditioning Installation Seahorse and Orchid Wards at CUH

Documents Received:

No.	Description	Complete	DC Eng Check
1.0	**Presentation**		
1.1	Manuals provided in ring binder		
1.2	Manuals separated for high level system control & equipment		
1.3	Separate ring binder provided fro drawings only?		
1.4	Ring binber provided with a front cover sheet containing, Project Title, Job Number and Date?		
1.5	Sections within manual individually separated and clearly referenced?		
1.6	Additional copy of manual retained by DCENG until all comments incorporated.		
1.7	On completion of DCENG comments, four copies of the manual are required. Two for the Client, one for the Contractor and one for DCENG.		
2.0	**Contents**		
2.1	Description included on how to use the O&M Manual?		
2.2	Contents page listing relevant sections of O&M Manual?		
2.3	Contractual and legal details:		
2.3.1	Comprehension list of points of contact including company name, address, telephone number, fax number, e-mail address and name of contact? Points of contacts should include: ● The building ● The building owner / client ● Building Services Consultant ● Architect ● Main Contractor ● Mechanical Contractor ● Electrical Contractor ● Specialist Contractors ● Commissioning Contractors		
2.3.2	All relevant Dates listed? These should include: ● Date of Practical completion ● Expiry date of defects liability period ● Date of final completion		
2.3.3	Guarantee Certificates provided for components, elements and plant? These should be listed.		
2.3.4	Contact in case of Emergency listed? This should include: ● Name of company ● Address ● Telephone number ● Fax number ● E-mail address ● Name of contact		
2.3.5	Description of the locations of fire fighting equipment? This should include: ● Gas main cock / emergency valve ● Electrical supply main switch ● Water main isolating valve ● Communications ● Other relevant services		
2.4	Introduction to technical data?		
2.5	Description of Services Installation (This should generally follow the description given within the DCENG Specification) For each of the systems installed include the following: ● The system type ● System location and what it serves ● What the system depends upon to function ● Design Data and parameters ● Reasons for plant selected ● Life expectancy of system and plant ● Expected operational efficiency		

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2.6	Equipment Schedule & Commissioning Data (This should generally follow the format of the DCENG data sheets. The equipment schedule should list all items of plant and equipment installed and include the following: ● Type ● Model reference ● Serial number & date of manufacture ● Location ● Duty / Performance ● Unit reference as shown on drawings ● Name of manufacture / supplier ● Weight ● Dimensions ● Noise data ● Electrical loads / requirements The commissioning data should be included for all services. Documentation should include the following: ● Measured data and results ● Measurement points ● Test equipment used ● Test equipment calibration test certificates and details ● A statement of the figures achieved against design ● Commissioning / test certificates for ALL systems		
2.7	Parts Identification and Recommended Spares		
2.7.1	List of replacement assemblies and components including 'exploded' drawings where necessary?		
2.7.2	List of recommendation spares and 'running spares"? (Running spares required for scheduled replacement due to wear deterioration stating applicable duration i.e. number of years or over plant life)		
2.8	Spares Policy		
2.8.1	Guide offering set-up of spares facility including recommendation stock levels? (This is normally prepared after consultation with occupier regarding consequences of failure and period of 'downtime' acceptable. Consideration also given to manufacturers recommendations.)		
2.9	Operational Descriptions This should give a comprehensive description of the instructions required for safe and efficient operation of ALL the systems installed, under both normal and emergency conditions. The descriptions should include the following: ● A recommendation strategy for operation and control ● An online of the general operations and control ● List of control data (Locations, effects, objectives, sequences, limits of capability, modes, set points, alarms and indications ● Procedures and sequences for start-up, running and shut-down, in both normal and emergency conditions ● Procedures for 'fault finding' when systems operations fail ● Interlocks between plant items ● Operations procedures for stand-by-plant ● Precautions necessary to overcome known hazards ● Means by which any potential hazardous plant may be made safe ● Target figures for both energy consumption and energy costs ● Forms for recording plant running hours, energy consumption & costs		

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3.0	**Controls**		
3.1	Fundamental Descriptions This should describe the controls strategy for each of the systems installed.		
3.2	Field Point Schedule This should include a schedule of all points installed and include the following as a minimum: ● Reference ● Function ● Settings ● Location		
3.2	Drawings These should include the following: ● Wiring & control diagrams ● Electrical schematics for whole system including installed equipment ratings		
3.4	Parts List & Equipment Details This should include a complete list of parts and details of the equipment installed		
3.5	Maintenance Schedule		
3.5.1	Manufacturer recommendations and instructions for maintenance detailed for each item of the control system installed?		
3.5.2	Clear distinction been made between Preventative and Corrective work?		
3.5.3	Instructions been given on the following: ● The isolation and return to service of plant and equipment ● Adjustments, calibrations and testing? ● Dismantling and reassembly? ● The exchange of components and assemblies ● The nature of deterioration and the defect to look for? ● Special tool, test equipment and ancillary services ● Lubrication schedules for all lubricated items of plant and equipment		
4.0	**Plant & Equipment**		
4.1	Maintenance		
4.1.1	Manufacturer recommendations and instructions for maintenance detailed for each item of plant and equipment installed, including inter-relation of systems?		
4.1.2	Clear distinction been made between preventative maintenance and corrective work?		
4.1.3	Instructions given on the following: ● The isolation and return to service of plant and equipment ● Adjustments, calibrations and testing? ● Dismantling and reassembly? ● The exchange of components and assemblies ● Dealing with hazards that may arise during maintenance ● The nature of deterioration and the defect to look for? ● Special tool, test equipment and ancillary services ● Lubrication schedules for all lubricated items of plant and equipment		
4.1.4	Maintenance schedules provided for all preventative tasks based upon manufacturer recommendations and authoritative literature? The frequency of each task may be expressed in the following ways? ● Specific time intervals ● Number running hours ● Completed number of maintenance operations Source of the information noted?		
4.1.5	Fault Finding procedures noted for logical diagnosis and correction of faults?		
4.2	Modification Information		
4.2.1	Information provided on permitted plant or system modifications allowed for by manufacturers or systems designers for future consideration and connection?		
4.2.2	Space allowed within O&M Manual for recording systems for plant modifications?		
4.2.3	Procedure stated to allow any modifications to plant or systems to be noted on ALL O&M Manuals regardless of location?		
4.3	Disposal Information Where relevant, information should be stated detailing the following information: ● Any known dangers likely to arise during disposal of specific items of plant or equipment together with the necessary precautions and safety measures. ● Methods for safety disposing of or destroying the equipment or any parts, including packaging, insulation and fluids. ● Sources where further information may be sought ● Hazards data sheets (COSHH)		
4.4	Names and addresses of manufacturers		
4.4.1	Details to be provided of manufacturer and supplier of plant and equipment This should include the following: ● Name of company ● Address ● Telephone number ● Fax number ● E-mail address ● Name of contact		

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4.4.2	Details to be provided of local stocklists of spare parts and replacements. This should include the following: ● Name of company ● Address ● Telephone number ● Fax number ● E-mail address ● Name of contact		
4.5	Manufacturer Information		
4.5.1	A complete list of manufacturer literature should be provided for all plant and equipment installed for ALL systems The information should include the following: ● Description of the product purchased and installed ● The cost and date of purchase ● Performance and behavioural characteristics of the equipment ● Applications and suitability for use ● Operations and maintence details ● Resources of labour, plant, materials and space required ● Methods of operation and control ● Cleaning and maintenance requirements ● Protective measures ● Labour safety and welfare associated with the plant ● Public safety consideration		
5.0	**As-Installed' Drawings**		
5.1	Index provided within the manual listing all of the drawings included? (This index should reference drawing title blocks of all the drawings included for ease of reference, and to act as a register in case drawings are misplaced)		
5.2	Index to include a list of ALL drawings issued by the manufacturer or supplier e.g. controls panel wiring diagrams?		
5.3	As-Installed' drawings to reflect the systems installed due to on-site co-ordination between services? (Should show correct dimensions, locations and sizes of services)		
5.4	Status' and 'Level of information' on the 'As-Installed' drawings reflect the comments made by the design team during the 'checking' and pre-construction period of the project?		
6.0	**Incorporation of Previous Comments** If O&M Manuals have been issued to the design team for comment previously, have all comments been incorporated?		