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METHOD STATEMENT FOR

TESTING & COMMISSIONING OF

VENTILATION AND EXHAUST FANS

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REVISION RECORD

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Rev. No.	Date	By	Chkd.	Approvals	Description and Page Numbers of Revisions

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1.0 PURPOSE

- This method statement is applicable for the Testing & Commissioning of Ventilation and General Exhaust Fans Units for the project as mentioned in the Specifications & Approved Shop Drawings.

2.0 SCOPE

- This method Statement shall cover the Testing & Commissioning of Ventilation and General Exhaust Fans Units in line with project requirements as indicated in the Approved Shop Drawings, specifications & manufacturer's instructions.

3.0 REFERENCE

- 3.1 Latest Approved shop drawings intended for HVAC Fans
- 3.2 Project Quality Plan
- 3.3 Project HSE Plan
- 3.4 Material Approval

4.0 DEFINITIONS

Main Contractor	:	
MEP Contractor	:	
PQP	:	Project Quality Plan
PSP	:	Project Safety Plan
QCP	:	Quality Control Procedure
HSE	:	Health, Safety and Environment
MS	:	Method Statement
ITP	:	Inspection Test Plan
QA/QC	:	Quality Assurance / Quality Control Engineer.
WIR	:	Inspection and Test Request
MIR	:	Material Inspection Request
ASHRAE	:	Air Society of Heating, refrigerating and Air-conditioning Engineers
SMACNA	:	Sheet Metal and Air-conditioning Contractor's National Association
ARI	:	Air Conditioning & Refrigeration Institute
ASME	:	American Society of Mechanical Engineers
NFPA	:	National Fire Protection association
UL	:	Underwriters Laboratories
BMS	:	Building Management System
NEMA	:	National Electrical Manufacturers Association
AMCA	:	Air Movement & Control Association

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TEFC : Totally Enclosure, fan Cooled

BS : British Standards

5.0 RESPONSIBILITIES:

➤ Responsibilities for ensuring that the steps in this procedure shall be carried out are specified at relevant steps in the procedure:

- Project Manager
- Construction manager
- QA/QC Engineer
- Site Engineer
- HSE officer
- SK

5.1 Project Manager

- The work progress shall be carried out as per planned program and all the equipment's required to execute the works shall be available and in good condition as per project planned.
- Specific attention is paid to all safety measures and quality control in coordination with Safety Engineer and QA/QC Engineer and in line with PSP and PQP.

5.2 Construction Manager

- Construction Manager is responsible to supervise and control the work on site.
- Coordinating with QA/QC Engineers, Site Team & Foremen for all activities on site.
- Control and sign all WIRs before issuing to Consultant approval.

5.3 Site Engineer

- The method of statement to the system shall be implemented according to the Consultant project specifications and approved shop drawings.
- Provision of all necessary information and distribution of responsibilities to his Construction team.
- The work progress shall be monitored in accordance with the planned work program and he will provide reports to his superiors.
- The constant coordination with the Safety Engineer to ensure that the works are carried out in safe working atmosphere.
- The constant coordination with the QA/QC Engineer for any works to be carried out and initiate for the Inspection for the finished works.
- He will ensure the implementation of any request that might be raised by the Consultant.
- Efficient daily progress shall be obtained for all the equipment and manpower.
- He will engage in the work and check the same against the daily report received from the Foremen.
- The passage of all the revised information to the Foremen and ensure that it's being carried out properly.

5.4 QA/QC Engineer (MEP):

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- The monitoring of executions of works at site and should be as per the approved shop drawings and project specifications.
- Ensure WIRs and MIRs are being raised for activities in timely manner and inspected by the Consultant.
- He will follow and carries out all the relevant tests as per project specifications.
- Obtain the required clearance prior to Consultant's inspections.
- Should acquire any necessary civil works clearances and coordination.
- QA/QC Engineer will assist the Consultant Engineer/ Inspector during Inspection.
- Check & ensure work is completed prior to offer consultant for inspection.
- Coordination with site construction team.
- He will assist the Consultant Engineer/ Inspector during the inspection.
- Ensure all works have been completed prior to raise inspection to the consultant.

5.5 Site Foreman

- The carrying-out of work and the proper distribution of all the available resources in coordination with the Site Engineer on a daily basis.
- Daily reports of the works are achieved and coordinated for the future planning with the Site Engineer.
- Incorporate all the QA/QC and Safety requirements as requested by the concerned Engineer.
- Meeting with any type of unforeseen incident or requirement and reporting the same to the Site Engineer immediately.

5.6 Safety Officer

- The implementation of all safety measures in accordance with the HSE plan and that the whole work force is aware of its proper implementation.
- The implementation of safety measures is adequate to maintain a safe working environment on the work activity.
- Inspection of all the site activities and training personnel in accident prevention and its proper reporting to the Construction Manager and the Project Manager.
- The site is maintained in a clean and tidy manner.
- Ensure only trained persons shall operate the power tools.
- Ensure all concerned personals shall use PPE and all other items as required.
- Ensure adequate lighting is provided in the working area at night time.
- Ensure high risk elevated areas are provided are barricade, tape, safety nets and provided with ladders.
- Ensure service area/inspection area openings are provided with barricade, tape, and safety nets.
- Ensure safe access to site work at all times.

5.7 Store Keeper (SK)

- Responsible for overall Store operations in making sure to store the material delivery to the site and keep it in suitable area that will keep the material in safe from rusty and damage.
- One who will acknowledge the receiving of materials at site in coordination with QA/QC & concerned Engineer.

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6.0 EQUIPMENTS

Following tools shall be arranged before starting the job.

- Basic Electrical Tools
- Pitot Tube/ Air Flow Meters
- Anemometer
- Multi Meter (FLA reading)
- Tachometer (Fan RPM reading)
- Marker
- Tool box
- Step Ladder

7.0 PROCEDURE

- Work Sequence/Procedure

7.1 General Requirements

a) H.S.E.

All general site safety requirements shall apply during testing and commissioning. The Contractor shall place suitable warning signs to ensure that all personnel are aware that additional hazards may exist. All personnel involved in the testing and commissioning shall be made aware of all safety requirements in a system commissioning Kick Off meeting and understand the commissioning scope.

b) Commissioning Prerequisites

- 1) Ensure a PTW system is in place
- 2) Pre-safety check
- 3) Ensure latest revision approval for installation drawings used
- 4) Ensure all the materials & equipment and there installation has been inspected and approved by client
- 5) Ensure that LOTO system is in place
- 6) Proper & safe access shall be maintained for inspection purpose
- 7) Punch list management & liquidation
- 8) All the relevant documentation done ready
- 9) All the relevant inspection equipments provided
- 10) Commissioning safety checklist checked

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11) Stable Electrical Power Supply source.

7.2 COMMISSIONING PROCEDURE

a) Functional Test

The following functional test will be carried out for the commissioning for the Typical of Ventilation and General Exhaust Fans

- Check and ensure pre-commissioning is done for Ventilation and General Exhaust Fans.
- Check and ensure permit to work is obtained and approved for the work to be performed.

Ventilation and General Exhaust Fans – Start-up:

- Check and ensure control panel are completed and commissioned the designated panel board for the related to Ventilation and General Exhaust Fans is commissioned prior to start-up.
- Check the line voltage by using multi meter.
- Switch on the control panel and check the indication lights are ON.
- Switch on the push button in the control panel (HOA switch shall be in Hand Mode) and run the motor for few minutes.
- Check the motor rotation for correct direction, if the rotation is in opposite direction, then interchange any two phases at motro terminals for correct rotation.
- Check and ensure that there is no unusual moise or vibration after start-up.
- After one hour operation of the Fan, check that all bolts/fasterners are secure and tight.
- Measure the voltage and drawn current of the motor and record the readings for motor starting amps, running amps, voltage.
- All BMS controls (peripherals) are checked for proper operation.

Testing & Balancing:

- Please note, after start-up and commissioning of Ventilation and General Exhaust Fans, approved independent third party agency will check and carryout the Testing & Balancing works in accordance with project specification, please refer to Testing, Adjusting & Balancing and approved procedure for Air & Water Balancing.

7.3 POST TEST CONDITION

a) Reinstatement

After the successful completion of the start-up and commissioning activities, ensure that all the commissioning check sheets/test sheets are signed by all parties and ensure the following:

- Commissioning certificates is signed and accepted by CONSULTANT.
- Removed all test instruments from the Ventilation and Exhaust Fans.

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- Ensure that the system is functional and no faults are noticed.
- Ensure Control panel is locked.

b) Preservation and Flat Condition

Once the system is reinstated as per project required, prior to leaving the premises ensure the following;

- Electrical power supply including all cabling etc. is complete and no further modification or changes are expected.
- Electrical power supply is stable, without any loose contacts and no unusual overheating of electrical connections and components are noticed.
- Access to the location is limited to authorised personnel only and they are notified that the system is already commissioned.

7.4 Commissioning of Exhaust Fans Control System:

a) Chemical rooms:

- Emergency Spill Exhaust Fans to be energize by control panel, shall be open when switch is on mode position. In case of chemical spill, fan can be operated through emergency push button installed in the chemical room.
- Emergency Spill Ventilator fans to be energize by control panel, shall be open when switch is on mode position, in case of chemical spill, ventilator fan can be operated through emergency push button installed in the chemical room.

b) Kitchen Fans:

- System Off: Extract Fan and Make-up air fan shall be off.
- System Start-Up: The kitchen extract fan & make up air fan to be energize by control panel, shall open when switch is on mode position, switch installed in kitchen area.

c) General Fans:

- System Off: Extract and Supply fans shall be off.
- Start Up: Extract and Supply Fans to be energize by control panel, shall open when switch is on mode position at normal operation.

d) Staircase & Lift Pressurization Fans:

- Fire alarm system will have primary control on the start/stop operation of the Staircase & Lift well pressurization Fan. So in case of fire condition, FACP (by Fire Alarm vendor) will give command to local control panel / MCC to start the fan.
- BMS shall only monitor the following:
 - Fan trip status
 - Fan Run Status

Alarms

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- The following alarms would be generated on BMS.
 - Staircase pressurization Trip: This is generated when the Fan Trip Signal is on as sensed by panel volt free contact.
 - Lift well pressurization Trip: This is generated when the Fan Trip Signal is on as sensed by panel volt free contact.
- e) Generator Room:
- System off: when Generator is off exhaust fans is off.
 - System Start-Up: Exhaust fan shall be interlocked with generator control panel, the fan switching shall be controled through a generator control panel.
- f) Toilet Exhaust Fans:
- To be energized from control panel installed at roof, motorize damper shall be open when toilet exhaust fan is on mode operation.
 - Incase of failure, toilet exhaust fan or no flow signal will be sent to control panel to energize the toilet exhaust fan and to operate motorize damper and switch off the motorize damper.

8.0 ATTACHMENTS

- 8.0. Inspection & Test Plan
- 8.1. Pre- Commissioning Check Sheet
- 8.2. Testing and Commissioning check Sheet
- 8.3. Commissioning Certificate Form
- 8.4. Handing Over Certificate Form
- 8.5. Punch List Form
- 8.6. Risk Assessment
- 8.7. Fans Schedule
- 8.8. Drawing Attachment