

1. ODOUR CONTROL SYSTEM

Geneal Specification

Inlet air characteristics

Parameter	ODOUR CONTROL UNITS
Duty	Continuous
Installation	Outdoor
Design ambient temperature	10 to 55 C
Type	Two treatment stages
Technology	Biological scrubber followed by polishing activated carbon layer
Combined or separate vessels	two separate vessels with compact design
Ventilation type	Forced

The design of the odour control system shall be as per the bidder's design.

The odour control unit shall be designed strictly as described in these specifications and shall achieve the following performance criteria as minimum.

PARAMETER	VALUE
Design maximum H ₂ S concentration	500 ppm Static
Design average H ₂ S concentration	100 PPM
Design maximum NH ₃ concentration	50ppm
Design maximum Mercaptance concentration	Traces Only
Design average Mercaptance concentration	Traces Only
Design H ₂ S removal efficiency	≥99% on maximum H ₂ S concentration
Design NH ₃ removal efficiency	≥99%
Flow rate	Minimum 6 x airspace volume / hour.
Design Ambient temperature	10-55 Degree C
Design Humidity	0-100%
Outlet H ₂ S concentration at the odour control unit	< 1 PPM

2. PROCESS REQUIREMENTS

Requirement	Description
Treatment Objective	Removal of H ₂ S & odorous gases from pumping stations

Air Flow System	Ducting, fans, extraction, isolation dampers, instrumentation
Stages	Stage-1- Bio-scrubber, Stage-2 - Activated Carbon
Water Recirculation	Automated, low-water requirement

Stage 1:

- The system is designed to remove hydrogen sulphide (H₂S) & other odorous compounds / gases by providing an environment providing the growth of acidophilic, Sulphur oxidizing bacteria. The system consists of Bio media, with material designed to resist compaction and degradation from acidic sulphates of the biological oxidation of the hydrogen sulphide. Irrigation / fresh water with nutrients will be supplied for humidification of the media, which shall be recirculated within the system to maintain the required pH and nutrients, shall be controlled with automated sensors and accessories. Here it is to be noted that continuous water shall not be possible to provide at the site, so system must be select in a way that water shall be recirculated & any top up of water or media shall be atomize sensor based
- First stage biological scrubber shall consist of media for bacterial growth which shall be made to resist compaction and degradation acidic environment.

Stage 2:

- It is used to remove any remaining hydrogen sulphide as well as other odorous compounds.
- Second stage shall be based on Activated carbon-based media as per standard specially made for odor removal application in waste water, pelletized to suit the application. This shall be water regenerable at site. Minimum life of the activated carbon in the first fill shall be 5 years.
- Water and acidic sulphate by products washed from the media leave the system through the drain piping at the bottom of the vessel and are returned to wet well or wastewater stream.
- The type of activated carbon selected must be effective in dealing with odours arising from maximum concentrations of hydrogen sulphide and other sewer gases

3. EQUIPMENT SPECIFICATIONS AND TECHNICAL REQUIREMENT

1. Pre-filter

Parameter	Specification
Function	Removes Large dust particles & reduce humidity to protect suction fans/biological units
Material	Housing shall be of FRP and filter cartridge shall be Non corrosive Polypropylene structured / random mesh- must be washable & long lasting
Accessories	Spray nozzles & drain shall be provided, differential pressure gauge to predict cleaning frequency

2. Inlet Isolation Damper Valve

1. An isolation damper valve shall be provided at the inlet of pre-filter to isolate the system from incoming gas during maintenance.
2. Dampers used to modulate airflow and for balancing purposes must be fabricated and installed in accordance with the latest Standards for OCU.

3. The dampers must be of Fiber glass. The damper shall be factory assembled units. Each unit must be supplied for heavy-duty operation and must operate through 90 degrees of operation, from fully open to fully closed.
4. All damper spindles and ancillary components shall stainless steel, and suitable for operation in an atmosphere where saturated air and H₂S gases are present. Any components where galvanizing is used or where copper or brass components are used are not accepted.

Parameter	Specification
Material	FRP
Operation	90° open/close
Components	SS316 spindles
Function	Airflow isolation & modulation to the OCU as required

3. Biological Scrubber

Section	Specification Requirement
General Requirement	1. The bio-scrubber filter unit shall be capable of continuously treating odorous air at the specified flow rates and shall be supplied complete with all auxiliary equipment required for full system operation.
	2. The system shall include: FRP vessel, bio-growth media with support frame, liquor recirculation system, liquor decant and make-up water arrangement, extraction fan(s), discharge stack, control panel, and monitoring instruments.
Bio Media Requirements	1. Media shall be acid-resistant, inorganic, and porous, providing large surface area for biological growth.
	2. Organic media such as wood chips, peat, or any degradable material shall not be accepted.
	3. Plastic foam or compressible media shall not be accepted.
	4. Media shall carry a minimum 15-year guarantee without replacement, pressure drop increase, shrinkage, compaction, or degradation.
Vessel Structural Design	1. Vessel shall withstand operating gas pressures and mechanical stresses during media loading/unloading.
	2. Filter shell, internals, and structural components shall be constructed from fiberglass (FRP) or equivalent corrosion- resistant materials.
	3. External colour shall be approved by AMC.
Access & Maintenance Requirements	1. Vessels shall include access hatch sized for media loading/unloading, inspection, and maintenance.
	2. Inspection hatches must allow visual inspection of spray patterns and media surface during normal operation.
	3. Hatches shall allow removal of internal components such as screens.
	4. Fixed platforms, walkways, guardrails, ladders and stairways shall be provided in accordance with applicable standards.

		5. System shall allow safe and easy access for maintenance of internal components.
Water Supply Requirements		Due to limited-service water availability, potable water with necessary nutrients shall be considered in design & System shall be designed to minimize potable water usage during daily operation.
Design Life Requirements		Each bio-scrubber vessel shall be designed and fabricated for a minimum service life of 20 years.
Bio Media Specifications – First Stage Biological Scrubber		Media shall be inert, porous and designed to resist compaction and degradation in acidic environments. Media shall promote optimal bacterial growth and maintain structural integrity throughout the service life.

DATA TABLE BIO MEDIA: -

Parameter	Value
Number of stages	Single stage
Material of Construction:	Pumice Stone, Porous Glass, Virgin Poly propylene, Synthetic PP Media
Features	Inorganic, Porous, Acid resistant, Non compressible
Life	15 years minimum
Operating pH	1.5 to 3.0 at the average H ₂ S concentration
Vessel Material	FRP
Recirculation	Duty/standby pumps, automated control

4. Mist Eliminators

1. Each bio-scrubbing filter shall incorporate an integral mist eliminator to remove any moisture or water droplets before entering the polishing carbon layer. Mist eliminators shall be designed as follows:

Parameter	Value
Type	As per manufacturing standard
Installation	As per manufacturing standard
Quantity	1 - Off, One for each vessel
Casing material of construction	GRP / FRP /PP

5. Activated Carbon Adsorption Unit

ITEM	SPECIFICATION
Material of Construction	The adsorber shell, internal components, and structural components shall be made of fiberglass (FRP) or equivalent corrosion-resistant material as mentioned in tender
Colour Requirement	The colour of the odour adsorber unit shall be approved by AMC.
Access Hatches – General	The unit shall include access hatches for loading and removal of spent carbon and for inspection of ancillary equipment.
Access Hatches – Size & Function	Hatches shall be sized to allow: (a) removal of carbon via suction hose from the top, and (b) manual shoveling of carbon through the side hatch.
Internal Component Access	Hatches shall allow easy removal of internal parts such as screens for maintenance.
Hydraulic / Flow Design	The absorber and ductwork shall be designed to minimise pressure drop and prevent short-circuiting of gas flow.
Maintenance Access	The system shall allow safe and easy access for all maintenance operations.

ACTIVATED CARBON MEDIA SPECIFICATIONS

Carbon Substrate : Coconut shell based / Coal Mined

Effect : Media shall be selected specifically for H₂S removal

Type : Pelletized, water regenerable

Regeneration : On site, Clean-In-Place

Life : 5-year minimum

Pellet diameter : Minimum 4mm,

H₂S absorption : 0.16g/cc Minimum, CTC 50 minimum

6. Extraction Fans

Fan Configuration

Section	Specification Requirement
Fan Setup	Duty/standby configuration with VFD operation
Isolation Equipment	Each fan includes isolation dampers and lightweight corrosion-resistant NRVs (PP/FRP/PE)

FAN TECHNICAL PARAMETERS

Parameter	Value
Type	Forced draft, centrifugal industrial fan
Design & Test Codes	IS 4894, ISO 5801, ISO13349
MOC	FRP / PP / PE
Quantity	2 (Duty/Standby)
Motor Starting Method	VFD
Sound Level	< 85 dB(A) at 1 m
Impeller Type	Manufacturer standard
Fan Drive Type	Direct drive or Belt Driven

ACCESSORIES & FEATURES

Item	Specification Requirement
1. Flanged Connections	Inlet/outlet flanges with flexible connectors.
2. Anti-Vibration Mounts	Provided.
3. Earthing	Fan and motor earthing included.
4. Drain Connection	Flanged or socket connected drain connection provided.
5. Lifting Eyes	Provided.
6. Inspection Opening	Provided.
7. Motor Protection	IP55, methane-safe per BS 5345.
8. Motor Poles	2-pole motors.
9. Duty Rating	S1 continuous duty.
10. Power Supply	3ph, 415V $\pm 6\%$, 50Hz $\pm 0.1\%$.
11. Efficiency	IE3 efficiency.
12. Environmental Rating	55°C ambient, 90% RH.
13. Thermal Protection	Provided.
14. Cooling Method	TEFC, IC 41 per BS EN 60034-6.
15. Insulation Class	Class F insulation, Class B temperature rise.
16. Sunshades	Motor equipped with non-corrosive FRP/PP sunshades
17. Balancing	ISO 1940, max 0.5 μm displacement; mechanical & electrical test run before shipment.
18. Bearings	Heavy-duty, self-aligning pillow block with grease fittings
19. Flexible Connectors	Corrosion-resistant; rated for max fan pressure; installed on inlet/outlet.

7. Damper Valves

Section	Specification Requirement
Functionality	Dampers shall divert or modulate the airstream to the OCU as required by the monitoring and control system.
	Dampers intended for air diversion only shall operate in fully open or fully closed position.
	Dampers intended for airflow modulation and balancing shall comply with specified fabrication and installation standards.
Materials of Construction (MOC)	Damper body: FRP / GRP suitable for corrosive odour-control environments.
	Dampers shall be supplied for heavy-duty operation.
	Dampers shall operate through 90° rotation (fully open to fully closed).
Spindles & Ancillary Components	All damper spindles and components shall be stainless steel, suitable for saturated air and H ₂ S environment.
	Galvanized, copper, or brass components are not permitted.

8. Ducting work

Section	Specification Requirement
Material of Construction (MOC)	All ductwork shall be fiberglass (FRP/GRP) with: <ul style="list-style-type: none">• Inner corrosion barrier: Vinyl ester resin fiber• Outer structural layer: Isophthalic resin fiber• External gel coat for UV protection
Minimum Thickness	Minimum duct thickness shall be 6 mm, unless otherwise stated in project specifications.
Manufacturing Method	Ducting shall be machine-wound FRP or moulded with proper outer surface finish. Hand-fabricated FRP ducting without mould is not acceptable.
Design Requirements	Ductwork must be designed to prevent liquid pooling. Duct shall either: <ul style="list-style-type: none">• Rise continuously to the unit, or• Have only one high point, allowing condensate to drain to the unit or back to the source.

9. Liquor recirculation system

Section	Specification Requirement
Pumps – Configuration	Minimum two centrifugal pumps in duty/standby configuration with automatic change-over.
Pump Type & Construction	Pumps must be centrifugal, mechanically sealed. MOC: PP / FRP, suitable for corrosive sump liquor and H ₂ S exposure. Pumps must be centrifugal, magnetic driven pump with no shaft seals to avoid leakage. MOC: PP/PVFD/FRP suitable for the corrosive liquid and H ₂ S exposure
Pump Suitability	Pump wetted parts shall be designed for the corrosive nature of the sump liquor
Sump Purge System	A sump purge valve shall be provided for flushing contaminant build-up. Valve must be automatically controlled with operator-adjustable settings.
Flow Indication	Flow indicators must be installed on all recirculation system components, including: • Flow to humidifier (if applicable) • Flow to each contactor spray system • Flow to monitoring instruments
Alarms & Safety Interlocks	No-flow alarm shall be provided in case of pump/recirculation failure. Low sump level alarm shall automatically stop recirculation pumps.
Automation & Bypass	All automated valves shall be provided with a manual bypass line to allow operation during actuator or control system failure.

10. Nutrient Dosing system

Section	Specification Requirement
System Configuration	Dedicated nutrient dosing set with mixing tank and duty & standby dosing pumps.
Mixing Tank	Material of Construction: PP or FRP, suitable for nutrient chemical solution.
Dosing Pumps – Type	Electronic dosing pumps suitable for low-capacity, accurate dosing.
Dosing Function	System shall dose the nutrient to the recirculation liquor line to maintain the biological activity.
Dosing System Components	Complete dosing package shall include: Storage tank, Duty & standby dosing pumps, Low level indicator, Back pressure valve/head, Dosing lines.
Operational Requirements	System must ensure accurate, stable dosing to support biological growth and maintain treatment efficiency.

11. Pipe work, Tubing and Ancillary Fittings

Section	Specification Requirement
General Requirements	All pipe work, tubing, and ancillary fittings (minimum internal diameter 6 mm) shall be corrosion-resistant and chemically resistant.
Flexible Tubing (Sampling & Sensors)	Sampling and sensor tubing shall be PTFE/PU, fully resistant to chemical absorption.
Gas Extraction & Discharge Ducting	Gas extraction and discharge ductwork shall comply with the ducting specification provided in the tender (FRP/GRP, corrosion-resistant, UV-protected, minimum thickness etc.).
Water Supply Piping	Water supply lines shall be uPVC with appropriate pressure rating as per system requirements.
Nutrient Dosing Tubing	Nutrient dosing tubing shall be PTFE, or better, using manufacturer-recommended material compatible with nutrient chemicals.

12. Foundation

Section	Specification Requirement
Compliance Standards to	All civil works shall be designed and constructed in accordance with AMC /standard Civil Structure Specifications, unless otherwise specified in this document.
OCU Installation Base	The Odour Control Unit (OCU) shall be installed on a concrete slab constructed on suitably prepared ground.
Concrete Slab Requirements	Slab thickness and compressive strength shall be adequate to withstand full equipment load, including dynamic loads.
Protection for Fiber glass Tanks	Rubber mats must be provided between FRP/GRP tanks and the concrete slab to prevent abrasion and structural stress.
Foundation Type	PCC and RCC foundation slabs shall be constructed as per the equipment size and loading requirements.

GENERAL SPECIFICATIONS

1. OCU structure

Section	Specification Requirement
Material & Durability	OCU Vessel/structure shall be constructed from Fiber / Glass- Reinforced Plastic (FRP/GRP). Material and surface finish must be durable, corrosion-resistant, and UV-resistant to achieve the required service life.

Structural Strength	<p>Structure shall be suitably reinforced and supported to withstand:</p> <ul style="list-style-type: none"> • Wind loads • Positive/negative operating pressures • Media loading & unloading loads <p>Environmental and operational forces</p>
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2. Fiberglass

Section	Specification Requirement
Construction Standard	All FRP vessels and components must comply with BS EN 13121:2016.
Laminate Structure	<p>FRP construction must include:</p> <ul style="list-style-type: none"> • Internal corrosion barrier • Structural laminate layer • Outer surface layer
Corrosion Barrier Requirements	Corrosion barrier must use vinyl ester resin, with minimum 1200 gsm CSM backing layer, or as recommended by resin supplier. All BS 4994 liner QA requirements apply.
Resin Selection	Resins & fillers must be compatible with chemical exposure. Resin must meet ductility and strength performance criteria per BS EN 13121.
Fabrication QA/QC	<p>Fabrication must comply with BS EN 13121 including:</p> <ul style="list-style-type: none"> • QA/QC testing • Full documentation • Independent inspection by third-party inspector or client representative
Resin Application by Layer	<p>Inner corrosion layer: Vinyl ester resin Structural + outer surface layers: Isophthalic resin External surface: Gel coat for UV protection</p>
Surface Finish & Manufacturing Method	Major FRP equipment (vessels, pre-filters, fans, FRP piping) must have smooth external finish. Machine-wound or die-moulded construction acceptable. Hand-wound, rough-surface FRP is not acceptable.
Inspection & Maintenance Access	Design must allow periodic inspection & maintenance to ensure full-service life.
Walkways & Access Systems	Walkways, stairs, and ladders shall be fiberglass (FRP) with UV-protection coating.

3. Parts

Section	Specification Requirement
Internal Parts Material	<p>All internal parts exposed to odorous gas must be acid- resistant, especially resistant to sulphuric acid.</p> <p>Internal parts shall be constructed from Vinyl Ester Resin Fiberglass (FRP/GRP).</p>
Fasteners	All bolts, nuts, and washers shall be Stainless Steel SS316.
Corrosion Protection	Design must minimize galvanic corrosion by avoiding dissimilar metal contact and ensuring proper isolation where required.

4. Adhesive, sealants, and gaskets

Section	Specification Requirement
Chemical Resistance	Adhesives, sealants, and gaskets must be resistant to: <ul style="list-style-type: none">• Oil• Water• Acid (especially sulphuric acid)• Any chemicals used within the OCU.
Microbial Resistance	Materials must be non-supportive of microbial growth.
Dimensional Stability	All sealing materials must be dimensionally stable under continuous operating conditions.
Gasket Material	Gaskets shall be EPDM or Neoprene, suitable for corrosive, wet, and chemically active environments.

MONITORING & CONTROL

1. Control Panel

Section	Specification Requirement
Control Panel Type	Standalone outdoor control panel dedicated for OCU operation.
Enclosure	Fiber glass enclosure, moulded finish, corrosion resistant, rated IP65.
Control System	PLC-based control with HMI (minimum 7" touch screen). Necessary conformal coating shall have to be provided in PLC
Connectivity	Provision for communication and data transfer to Main Plant SCADA system.
Operation Mode	System shall be fully automated with option for manual operation.

2. Instruments & Monitors

Instrument / Monitor	Specification Requirement
H ₂ S Gas Analyzer – Inlet	Measuring range 0–500 ppm. Designed for high humidity, installed directly on suction pipe. Must transmit data to PLC and HMI, with option for SCADA integration.
H ₂ S Gas Analyzer – Outlet	Measuring range 0–100 ppm, installed on OCU outlet vent. Data transmitted to PLC/HMI/SCADA.
Gas Sampling Ports	Sampling ports required at inlet and outlet of each vessel and at final OCU outlet for performance verification.
Recirculation Flow Meter	Rota meter-type flow meter for monitoring liquor recirculation flow.
Nutrient Tank Level Monitoring	Level and/or low-level switch for nutrient storage tank.

Instrument / Monitor	Specification Requirement
Recirculating Sump Level Monitoring	Level and/or low-level switch for recirculating sump.
Differential Pressure Indicators	DP indicators across: <ul style="list-style-type: none"> • Pre-filter • Bio-scrubber vessel • Activated carbon vessel
pH Monitoring	pH analyzer for recirculating liquor monitoring.
Permanent Media Bed Sampling Ports	Additional 2 or 3 sampling ports on activated carbon vessel located at 25%, 50%, 75% (or equivalent) of bed depth.
Additional Sampling Points	Contractor to provide any extra inlet/outlet sampling points required for complete OCU performance monitoring.

WARRANTY

Section	Specification Requirement
Supplier Responsibility	The selected OCU supplier shall be responsible for all aspects of the contracted work including: <ul style="list-style-type: none"> • Project management • Design & fabrication • Complete assembly • Equipment testing & inspection • QA/QC compliance • Performance testing
Compliance Guarantee	Supplier must guarantee that the entire scope of supply safely and reliably meets all requirements of <ul style="list-style-type: none"> • Project specifications • Design summary reports • Reference drawings • Contract documents
Defects Warranty	All equipment and components shall be guaranteed against defective materials, design faults, and poor workmanship.
Rectification Responsibility	Supplier shall provide all materials, parts, and services free of cost to rectify any defects arising during the warranty period.
Performance Guarantee	The performance of each treatment stage of the OCU shall be guaranteed to meet the performance requirements specified in the project specifications.

1. Pre-commissioning (Factory Acceptance Test)

Section	Specification Requirement
Pre-Commissioning Requirement	Pre-commissioning of the OCU shall be conducted at the manufacturer's factory before shipment to site.

Presence of AMC Personnel	All pre-commissioning and FAT activities shall be performed in the presence of authorized AMC personnel & TPI (Appointed by AMC)
Scope of Pre-Commissioning	Pre-commissioning shall include inspection, verification of fabrication quality, equipment functionality, assembly checks, electrical checks, and documentation review.
FAT Requirement	All critical components must undergo FAT before dispatch. FAT shall comply with approved procedures and tender specifications.
Minimum FAT Activities	FAT must include, at minimum: • Mechanical inspection • Electrical and control system verification • Performance checks (where applicable) • QA/QC documentation review • Visual inspection of FRP construction • Verification of instrumentation and control elements • Verification of accessories, fittings, and material compliance
Availability of Documents at Factory	The contractor shall ensure the following are available before inspection: • Approved drawings • QA/QC reports • Material certificates • Test records • Calibration certificates • O&M manuals • Compliance statements
Inspection Notice	Contractor shall issue an Inspection Call Letter to AMC minimum 2 weeks before the planned inspection date.
Cost Responsibility	Contractor shall bear all costs associated with FAT and pre-commissioning, including: • Testing costs • Travel and accommodation for AMC inspectors • Factory arrangements • Any repeated testing if failed
Dispatch Approval	Equipment may only be dispatched after FAT clearance and formal approval from AMC.

Sr. No / Equipment	Test Description	Standard / Type	Reference
1. Gas Extract ion Fan	Performance Curve Test	Witness IS 4894	Performance Curve
	Design Operation Point	Witness IS 4894	Performance Curve
	Surface Finish	Visual Inspection	Section 2.1.5 Fiberglass
	Fan Motor Routine Test	Review OEM test certificate	Data sheet
2. Control Panel	Control Logic	Witness	Control Philosophy and Single Line Diagram
	Accessories Make & Model	Visual Inspection & verification	Data sheets of accessories
	HMI Interface	Visual Inspection	Control Philosophy
3. Pre-filter	Barcol Hardness, Wall thickness	Witness EN13121	Drawing
	Dimension and Surface Finish	Visual Inspection	Drawing
4. Vessel	Barcol Hardness, Wall thickness	Witness EN13121	Drawing
	Dimension and Surface Finish	Visual Inspection	Drawing
	Resin Material Test	ASTM E1252, Review Third Party Test Report (NABL approved).	Section 2.1.5 Fiberglass
	Fiberglass Production overview	Review Production method and Production Log at Factory for Resin Batches & Type used	Section 2.1.5 Fiberglass
5. Bio- media	Bulk Density	Witness ASTM C29 / C29M	Data sheet
	Compressive Strength	Witness ASTM D6684	Data sheet
6. Activated Carbon	Density	Witness ASTM D2854	Data sheet
	Particle size	Witness ASTM D2862	Data sheet
	Hardness	Witness ASTM D3802	Data sheet
	H2S Adsorption	Witness ASTM D6646	Data sheet
7. Instruments	Visual Inspection	Review Make, Model and OEM Test/calibration certificate	Data sheet

2. Installation

Approval

- Prior to installation, approval from the AMC Engineer must be obtained where required.

Materials and equipment inspection

- Prior to transportation to site, materials and equipment must be checked for compliance with the appropriate Specification or Standard by conducting a Factory Acceptance Test
- On site, prior to installation, materials and equipment must be checked to ensure that they are free from damage caused during transportation and are fit and suitable for use.

3. Commissioning

- Following installation, the OCU must be tested and commissioned in accordance with Technical Specification - Commissioning - transitioning assets into operation.
- The commissioning plan developed by the Contractor must be submitted to AMC for review. Written approval from AMC must be sought prior to commissioning.
- The Contractor must provide the necessary expertise and resources for successful commissioning of the unit.
- Following installation, the OCU must be test run. The Contractor is responsible for conducting onsite performance tests to AMC's satisfaction to prove the compliance with guarantees. At a minimum, the following must be checked or carried out:

1. Odorous gas (H₂S) removal rate, Inlet & outlet Gas parameters in ppm
2. Control Panel Interlocks
3. Differential Gauges
4. Controls and Alarms
5. Equipment operation

- During the test run period, the Contractor must maintain the OCU in a proper working manner. The unit must be used to demonstrate the system performance to AMC's satisfaction. Contractor must carry out any work necessary to ensure the OCU is working properly. Contractor must submit O&M Manuals, Drawings and Log sheets to AMC.

4. Performance Testing

- Field performance tests must be carried out by the contractor after installation and commissioning of the plant. The contractor must undertake performance and systems tests to demonstrate acceptable performance, as defined by:
 - Successful operation of each item of equipment.
 - Overall system operation meets the performance criteria described in this specification, including correct operation in all control modes, e.g. in manual, local, and auto control.
 - Inlet gas contaminant removal performance meets the criteria provided in this specification.
- AMC will give notice in writing of final acceptance to the Supplier following the successful completion of the performance testing.
- The contractor is to supply all test materials, temporary test equipment, consumables and experienced personnel required to demonstrate compliance with the specification.
- Before performing any tests, the contractor must arrange with the AMC to inspect the installation. When the following prerequisites are completed, the AMC will confirm a time for conducting the performance tests:
 - The Purchaser has inspected the plant after commissioning and is satisfied with the installation and its function.
 - All documentation associated with commissioning have been received and approved by the Purchaser.

- All test equipment used during tests must have a current calibration certificate (issued within the preceding 12 months) verifying its accuracy.

The contractor must operate and be responsible for test equipment used during performance testing. At the completion of the performance tests copies of the performance test data log sheets must be provided by the contractor to AMC.

If OCU system fails to meet the performance requirements, the contractor must rectify the problems immediately. The contractor must, at no extra cost to the AMC, carry out all work necessary to ensure and prove that the equipment achieves the specified performance. When rectification work is complete, the equipment must be retested to verify that the specified performance has been achieved.