



# JHARKHAND STATE POLLUTION CONTROL BOARD

TOWNSHIP ADMINISTRATION BUILDING, HEC, Complex, Dhurwa, Ranchi 834004  
Telephone: 0651- 2400850 (FAX)/2400851, 2400852, 2401847, 2400979, 2400139

Tender No.:.....

Date:.....

## NOTICE

### INVITATION FOR BIDS (IFB)

**PROJECT: SUPPLY, INSTALLATION, COMMISSIONING AND OPERATION & MAINTENANCE SERVICES OF MOBILE CONTINUOUS AMBIENT AIR QUALITY MONITORING VANS (MCAAQMV)**

1. **Jharkhand State Pollution Control Board, Jharkhand**, invites double cover tender from eligible bidders for supply, installation, commissioning of equipment and Operation & Maintenance Services of Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) at different locations and related services as specified in the bid document.

<b>Name of the work</b>	Supply, Installation, Commissioning and Operation & Maintenance Services of 02 nos. of Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV)
<b>Mode of Submission</b>	Physical submission through speed post/ registered post/ courier or in person in two bid system
<b>Bid Price</b>	Bidders to quote bid price in INR only.
<b>EMD Price</b>	2% of the value of subject matter in the form of Bank draft/ Bank Guarantee, in favor of Member Secretary, Jharkhand State Pollution Control Board, payable at Ranchi.
<b>Email</b>	<a href="mailto:ranchijspcb@gmail.com">ranchijspcb@gmail.com</a>

### 2. Critical Date

Please Note: All bid related activities (Process) like Tender Document Download, Bid Preparation, and Bid Submission will be governed by the time schedule given under Key Dates below:

Description	Date & Time
Published Date	06/02/2026
Bid Document Download/Sale Start Date	07/02/2026
Clarification Start Date	10/02/2026
Clarification End Date	12/02/2026
Pre-Bid Meeting	13/02/2026
Uploading of Minutes/Clarifications on JSPCB Portal	16/02/2026
Bid Submission End Date	27/02/2026; 03:00 PM
Bid Opening Date	27/02/2026; 03:30 PM

*\*Dates mentioned here, are scheduled dates for Bid Opening Activities. Any changes in dates of opening of technical and commercial bids shall be notified in 'Press Notice / Corrigendum' section on the Tendering sub portal of the department before opening of the same.*

*Note: JSPCB reserve the Right to alter / change above schedule under unavoidable circumstances and such changes will be displayed at JSPCB web site: [www.jspcb.org.in](http://www.jspcb.org.in)*

Sd/-

(Rajeev Lochan Bakshi)  
Member Secretary

Tender Ref. No.:.....

Date:.....

**NOTICE**  
**INVITATION FOR BIDS (IFB)**  
**FOR**  
**SUPPLY, INSTALLATION AND COMMISSIONING AND**  
**OPERATION & MAINTENANCE SERVICES OF MOBILE**  
**CONTINUOUS AMBIENT AIR QUALITY MONITORING**  
**VAN (MCAAQMV)**



**FOR**  
**JHAKRHAND STATE POLLUTION CONTROL BOARD**

**T.A Division, HEC Complex,  
Dhurwa, Ranchi- 834004 (JH)**

## INDEX

SECTIONS	CONTENT	PAGE NO.
<b>VOLUME 1</b>		
<b>SECTION I</b>	NOTICE FOR INVITATION OF BIDS	3-26
<b>SECTION II</b>	SCOPE OF WORK	27-49
<b>SECTION III</b>	FORM OF TECHNO-COMMERCIAL BID	50-79
<b>SECTION IV</b>	FORM OF FINANCIAL BID	80-87
<b>SECTION V</b>	GENERAL CONDITION OF CONTRACT	88-106
	SPECIAL CONDITION OF CONTRACT	107-135
<b>VOLUME II</b>		
	TECHNICAL SPECIFICATION (ANNEXURES)	136-173



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<b>Venue for opening of tender</b>	JSPCB HQ, T. A Division, HEC Complex, Dhurwa Ranchi- 834004 (JH)
<b>Address for Communication</b>	The Member Secretary, JSPCB, T.A Division, HEC Complex, Dhurwa Ranchi- 834004 (JH)
<b>Email</b>	<a href="mailto:ranchijspcb@gmail.com">ranchijspcb@gmail.com</a>

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Sd/-  
**(Rajeev Lochan Bakshi)**  
Member Secretary

## ANNEXURE – I

### (Items Description for one Mobile CAAQM Station)

Sl. No.	Name of the instrument/ Equipment/ Item	Quantity(Nos)
1.	Continuous Ambient Carbon Monoxide (CO) Analyzer	One
2.	Continuous Ambient Sulphur Dioxide (SO <sub>2</sub> ) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen (NO/NO <sub>2</sub> /NO <sub>x</sub> ) Analyzer	One
4.	Continuous Ambient Ammonia (NH <sub>3</sub> ) Analyzer	One
5.	Continuous Ambient Ozone (O <sub>3</sub> ) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM <sub>10</sub> Particulate Matter Monitor	One
8.	Automatic PM <sub>2.5</sub> Particulate Matter Monitor	One
9.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
10.	Multi-calibration systems for Gas Calibration and Meteorological, Flow and Electronic Calibration	One Set
11.	Sensor based instrument to measure Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank- up Meteorological Tower.	One Set
12.	Computer system consisting of one PC along <i>Colour Laser printer with latest specification</i> , and DAS at the monitoring station with peripherals. Software for data acquisition/ Data transfer and system integration, telephone, Modem.	One Lot
13.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analysers with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line Fittings, Tools (electrical and mechanical).	One Unit
14.	Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin.	One Unit
15.	Air Conditioner, Split Type, Roof Mounted along with voltage stabilizer (2 x 2 ton)	Two Unit
16.	6.5 KVA petrol generator (2 nos.)	One Unit
17.	Online UPS (1x5 KVA, 2 <b>Hours</b> backup)	One Unit
18.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analyzers with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line Fittings, Tools (electrical and mechanical).	One Set

19.	<p><b>G.P.S. SYSTEM</b></p> <p>The van should have GPS tracking facility and Wi-Fi facility so that its movement can be monitored from Head Office. Integrated GPS &amp; 3G modules for location tracking and wireless communication</p> <ul style="list-style-type: none"> <li>• To operate with GPS / GSM / GPRS wireless network - GPS chipset with high sensitivity</li> <li>• GPRS with sim card.</li> <li>• Intelligent activation of GPS positioning</li> <li>• To start working automatically after electrifying - Built-in ON / OFF power, wide voltage input range - Built-in monitoring CPU, eliminating breakdown automatically</li> <li>• Commands and location information received by SMS</li> <li>• Easy to install, open or hidden installation alternatives</li> <li>• Two power input approaches: car-specific joint or car battery - Antenna: Built-in GSM, GPS antenna with low noise and high gain.</li> </ul>	As Specified
20.	<p>Seating arrangement:</p> <p>The basic van provided by the client shall be with company fitted driver seat +1 seat. An additional two seats, with Seat belts, shall be provided as under:</p> <ul style="list-style-type: none"> <li>• All the seats shall be firmly fixed and secured properly. - Seats shall have a capacity to bear 400 kg of weight.</li> <li>• All seat cushions shall be of good condition with new soft upholstery. Prior approval for material quality and make shall be taken from the engineer in charge.</li> </ul>	As Mentioned
21.	<p>Fresh Water Tank, Drain Water Tank, and Wash basin</p> <ul style="list-style-type: none"> <li>• Fresh water overhead storage Tank of about 50 liters (plastic) shall be fixed on the top of the roof of the van.</li> <li>• The drain water tank (15 ltrs) shall be made of 3 mm thick, food-grade plastic, to be mounted underneath the platform table. Total 2 such tanks shall be provided (One for the inlet water supply to the wash basin tap and the Second for the collection of wastewater from wash basin)</li> <li>• The wastewater tank should be fitted with a controlled drainage facility to drain the wastewater as and when required.</li> <li>• Both the Tank shall be easily removable for any</li> </ul>	1+1 (W) total 2

	<p>sort of Maintenance and Cleaning purpose</p> <ul style="list-style-type: none"> <li>• Wash Basin: Stainless Steel (SS) wash basin with SS water tap of supplying water.</li> <li>• A separate 0.5 HP pump (to be operated on external electricity) to fill-up the overhead water tank shall be provided and fixed at the appropriate place, near the washbasin. Prior approval for material quality and make shall be taken from engineer in charge</li> </ul>	
22.	<p>Fire extinguisher mounting: A proper heavy-duty bracket support (powder-coated on MS structure) should be provided beside storage 1 for placing a fire extinguisher. 1 No. of 2 Kg capacity in Driver cabin and 1 No. of 6 Kg in the laboratory area.</p>	2 Units
23.	<p>First aid kit: Cotton rolls, Iodine, Scissors, Boric acid powder, Band aid strips. All other accessories and medical facility.</p>	One Unit

**Note: 1.** Total quantity shall be 2 nos. of MCAAQMV.

## VOLUME 1

### SECTION I (ITB)

#### INSTRUCTIONS TO BIDDERS

##### CONTENTS

Sl No.	Particulars	Page No
1	Definitions	8
2	Introduction	9
3	Bidding Documents	14
4	Preparation and Submission of Bid	15
5	Preparation of Techno-commercial Bid	15
6	Preparation of Financial Bid	18
7	Submission of Bid	19
8	Opening and Evaluation of Techno-commercial Bid	21
9	Notification of Successful Techno-commercial Bid	23
10	Opening of Financial Bid	23
11	Examination of Financial Bid	23
12	Evaluation and Comparison of Financial Bid	23
13	Award of Contract	24
14	Performance Security	25
15	Expense of Bid	25
16	Responsibility for information supplied	26

**Important: Bidders are expected to examine the Bidding Documents carefully and are deemed to have received and read all documents. It shall be the responsibility of the Bidder to request copies of any missing documents. Failures to do so will be at the Bidder's risk.**

#### INSTRUCTION TO BIDDERS

##### 1.0 DEFINITIONS:

The terms used in this bidding document shall have the meaning defined hereunder:

**1.1** "The Project" or "The Works" means supply, installation & Commissioning Operation & Maintenance of Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) at the pre-defined city/location

**1.2** "The Authority" means the Member Secretary, Jharkhand State Pollution Control Board, Jharkhand, having its office at Ranchi, Jharkhand, India and shall include any person or persons authorized by the Authority. The Authority is also the executing agency of the Project. "The Owner" means the JSPCB.

**1.3** "The Bid" means the offer or proposal of the Bidder to be submitted for the works in accordance

with the stipulations set forth in these Bidding Documents.

- 1.4** “The Techno-commercial Bid” means the Techno-commercial part of the Bid.
- 1.5** “The Financial Bid” means the financial part of the Bid.
- 1.6** “The Bidder” means either the manufacturer of the Equipment or his Authorized Representative, who submits the Bid for the Works.
- 1.7** “The Authorized representative” means the bidder who has enclosed the manufacturer’s authorization as per the format “Form of letter of authorities” provided as *Attachment 3* of Section III.
- 1.8** “The Contractor” means the Bidder, whose Bid for the Works has been accepted by the JSPCB and includes his personal representatives, successors and authorized assignees.
- 1.9** “The Manufacturers” means the firms, which produces the equipment to be furnished by the Contractor under the Contract with the JSPCB.
- 1.10** “The Bidding Documents” mean all the documents in Volume I and II in the bidding documents annexed thereto.
- 1.11** “The Contract” means the written agreement to be concluded between the JSPCB and the Contractor and includes terms and conditions stipulated on the Bidding Documents and any other descriptions annexed thereto which form an integral part of the agreement to be provided by the JSPCB.
- 1.12** “The Equipment” means all kind of materials, machinery, components, apparatus, articles and instruments for the Project to be provided by the Contractor to the JSPCB under the Contract.
- 1.13** “The Specifications” means the specifications of ‘The Works’ to be performed by the Contractor in conformity with those specified in the Technical Specifications of Volume II and all other related documents in the Bidding Documents, and modifications thereof or additions thereto as may from time to time be made and approved in writing by the Authority through the Consultant in case prior to the Contract and agreed upon by both the Authority and the Contractor after the Contract.
- 1.14** “S/W” means the Scope of Works in Section II of this Volume.
- 1.15** “The Sites” means Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) at the defined city/ location.
- 1.16** “The Contract Price” means the price payable to the contractor under the contract for the full and proper performance of its contractual obligations.

## **2.0 INTRODUCTION:**

- 2.1** The Jharkhand State Pollution Control Board intends to invite bids from eligible bidders for the supply, installation, commissioning and operation & Maintenance of equipment’s for Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) at specified city/locations.

### **2.2 Scope of Works**

The description of the Scope of Works is set forth in Section II of this Volume 1.

### 2.3 Size of Bid

The whole bid is for a single composite package as detailed in Section - II i.e., scope of work.

### 2.4 Eligible Equipment and conformity to the bidding documents

- (1) Through National Competitive Bidding, all countries are the eligible source countries for goods and services to be supplied under this contract.
- (2) For the purpose of this clause “origin” means the place where the equipment or component parts thereof are grown or produced. Equipment is produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.
- (3) The Bidder shall furnish the Certificate of Country of Origin (duly authenticated by competent authority of that country) of each Equipment (as per Attachment 4 to Section III) in these instructions, as the documentary evidence of the eligibility of the Equipment.
- (4) The origin of equipment may be distinct from the nationality of the bidders.
- (5) Conformity of the Bidding documents may be in the form of literature, drawings, and data, and the Bidder shall also furnish:
  - a) A detailed description of equipment, essential technical and performance characteristics.
  - b) A list giving full particulars, including available sources of all spares (whether mandatory or recommended) and their prices, special tools etc., necessary for the proper and continued functioning/maintenance of the equipment on long term basis.
  - c) An inventory of the spare parts for each piece of equipment available with the O&M partner in India, mentioning the ones not available in India and that have to be imported in case necessary after the expiry of the O&M period.
  - d) **A clause-by-clause commentary of the Technical Specifications** demonstrating the equipment’s substantial responsiveness of these specifications or a statement of deviations of exceptions to the provisions of the Technical Specifications.

The above stated requirements are at a minimum and the Authority reserves the right to request any additional information concerning the Bid Proposal in response to this Invitation of Bids.

### 2.5 Qualifying Requirements of Bidders:

This invitation for the Bid is open to any bidder who is a reputed manufacturer / OEM of the gas analyzers, who, on its own or along with an associate as O&Mpartner, meets the Qualifying Requirements stipulated hereunder for participation in the tender. The bidder shall furnish satisfactory evidence to establish that the bidder meets the following qualifying requirements.

- 2.5.1 The bidder must have ISO 9001 Quality certification, ensuring all design and manufacturing processes meet international quality standards.

- 2.5.2 The bidder should have at least five years' experience in Supply, Installation, and Commissioning in satisfactory operation of Real time Continuous Ambient Air Quality Monitoring Stations with CPCB or SPCB in India.
- 2.5.3 The bidder shall have supplied, tested Installed and commissioned at least 04 no's of Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) consisting of (NO/ NO<sub>2</sub>/ NO<sub>x</sub>, NH<sub>3</sub>- Ammonia, SO<sub>2</sub>, CO, Ozone, BTEX, PM<sub>10</sub>, PM<sub>2.5</sub>, Multi-point dilution calibrator and rack mounted Zero Air Generator (OAM - original analyzer manufacturer make), Meteorological System, including Mobile Chassis & mobile body fabrication in any one of last 05 years to any of PSUs, Central/ State Pollution Control boards or any Govt. undertaking in compliance to the technical specification as mentioned in the tender and can produce evidence of experience of having successfully completed similar works as specified above (Continuous Ambient Air Monitoring Station based on NAAQMS guidelines -2009 of CPCB & amendment if any.)
- 2.5.4 The bidder shall be the Manufacturer of the above-mentioned analyzers and accessories. Experience of the bidder and the offered model should be of the same make.
- 2.5.5 The bidder should be OEM / Manufacturer for supply of (NO/ NO<sub>2</sub>/ NO<sub>x</sub>, NH<sub>3</sub>- Ammonia, SO<sub>2</sub>, CO, Ozone, BTEX, PM<sub>10</sub>, PM<sub>2.5</sub>, multi-point dilution calibrator and rack-mounted Zero Air Generator (OAM - original analyzer manufacturer make).
- 2.5.6 The bidder, a manufacturer or authorized representative, must design and manufacture equipment used in the systems in order to provide a high level of control over the quality of the systems. All the components of CAAQMS, including all gas analyzers, calibration systems, zero air generators, sample manifolds, data acquisition system and central data management software must be of the same make & manufactured by the supplier.
- 2.5.7 The bidder shall have an annual turnover not lower than Rs 50 Crore or more at least during one year out of the last 3 financial years. The bidder shall produce an annual report (Balance sheet & profit & loss statement) as proof for the same.
- 2.5.8 The bidder should have executed a single order of Fixed Continuous Ambient Air Quality monitoring Stations including minimum 01 no. of Mobile Ambient Air Quality monitoring Stations having above all the specified parameter during the last 05 years totaling to Rs 750 Lacs or more with any of the public sector's organization, State pollution control boards or any Govt. undertaking ending last day of the month previous to the one in which the tender is floated. The bidder should submit the relevant documentary evidence, like PO/proof of supply or a duly attested Invoice copy, along with the technical bid.
- 2.5.9 As per Govt of India order No. P-45021/2/2017-PP (BE-II) Dated 04th June 2020 issued by Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade, in accordance with Public Procurement (Preference to Make in India) Order, 2017 Dt. 04-06-

2020 will be followed for this Tender. The Indian manufacturer shall be given preference in this purchase. The purchase preferences towards supplies as stipulated in the referred order therein shall be extended to those who qualify under the category strictly on the basis of value addition carried out in India on the manufacturing & supply of Continuous Ambient Air Quality Monitoring Station (CAAQMS).

- 2.5.10 For all the items not manufactured by the Bidder, i.e. Analyzers, Monitors, Calibrators, and Sensors, the bidders should be authorized by the manufacturers for these items as per the format “Form of letter of authorities” provided as Attachment 3 of Section 3, except where make is prescribed.
- 2.5.11 The Govt of India Order No. F. No. 6/18/2019-PPD dated: 23/07/2020 issued by Ministry of Finance, Department of Expenditure, Public Procurement Division - Compliance of Restrictions under Rule 144 (xi) of GFR 2017: Restrictions on procurement from a bidder of a country which shares a land border with India will be applicable for this tender. A declaration with effect to be provided by all the bidders in this tender.
- 2.5.12 Bids of bidders quoting as authorized representatives of a manufacturer who meet the above requirements in full can also be considered, provided:
- (i) the manufacturer furnishes a legally enforceable authorization certificate in the prescribed form at Attachment-3 Section-III, assuming full guarantee and O&M obligations as per GCC and SCC, for the goods offered; and
  - (ii) The bidder, as authorized representative, supplied, tested Installed and commissioned at least 04 nos. of Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) consisting of (NO/ NO<sub>2</sub>/ NO<sub>x</sub>, NH<sub>3</sub>-Ammonia, SO<sub>2</sub>, CO, Ozone, BTEX, PM<sub>10</sub>, PM<sub>2.5</sub>, Multi-gas calibrator and rack mounted Zero Air Generator (OAM - original analyzer manufacturer make), Meteorological System, including Mobile Chassis & mobile body fabrication in any one of last 05 years to any of PSU, Central/ State Pollution Control Boards or any Govt. undertaking in compliance to the technical specification as mentioned in the tender and can produce evidence of experience of having successfully completed similar works as specified above (Continuous Ambient Air Monitoring Station based on NAAQMS guidelines -2009 of CPCB & amendment if any.) The bidder shall be the Manufacturer of above-mentioned analyzers and accessories. Experience of bidder and offered model should be of same make.
  - (iii) The bidder should be OEM / Manufacturer for supply of (NO/ NO<sub>2</sub>/ NO<sub>x</sub>, NH<sub>3</sub>- Ammonia, SO<sub>2</sub>, CO, Ozone, BTEX, PM<sub>10</sub>, PM<sub>2.5</sub>, Multigas calibrator and rack mounted Zero Air Generator (OAM - original analyzer manufacturer make)
  - (iv) In this tender, either the Authorized Representative on behalf of the Principal/ OEM (Original Equipment Manufacturer) / OEM itself can bid but both cannot bid

simultaneously for the same item/product in the same tender.

- (v) If an Authorized Representative submits a bid on behalf of the Principal/OEM, the same Authorized Representative cannot submit a bid on behalf of another Principal/ OEM in the same tender for the same item/product.

2.5.13 The bidder should furnish the information on all past supplied and satisfactory performance for both 2.5.1 and 2.5.4 (ii) above, in “Performance Statement” as per Attachment No. 8 B & 8 C respectively of Section-III and documentary evidences for minimum five (5) nos. of CAAQM, client certificate in favor of bidder or manufacturers of equipment for similar air monitoring stations (**CAAQM stations for all eight (CO, SO<sub>2</sub>, NH<sub>3</sub>, NO/NO<sub>2</sub>/NO<sub>x</sub>, O<sub>3</sub>, BTX, PM<sub>10</sub>, PM<sub>2.5</sub>) AAQ monitoring parameters**) in India towards support of the satisfactory operation of similar air monitoring stations, which is in use for last two (2) years in case bidder is manufacturer or for last two (2) year in case bidder is authorized representative.

2.5.14 The bidder shall submit the latest AQI report for any of the supplied & installed CAAQMS by the bidder, including all the specified 8 parameters duly approved by CPCB/ SPCBs.

2.5.15 The bidder or their associate as O&M partner should have adequate O&M experience of a similar monitoring station for a minimum of 3 years and above and should have adequate financial capability to execute the contract. The bidder or their associates with an O&M partner in India, (any authorized agency in India) should have a minimum 25 Nos. of well-trained O&M personnel on its regular rolls as per the following details. To establish this bidder should enclose the curriculum vitae & latest PF paid challan/ advice of the above 25 Nos. along with the below listed technical personnel with the required experience.

Sl. No.	Responsibility	No. of Persons	Minimum Qualification	Minimum Experience
1.	Project Manager	1 No.	Graduate Engg./ M.Sc.	10 years
2.	Technician	1 No. foreach CAAQM	Diploma in Electronics/C&I/ Electrical	1 year
3	Data Processing Expert	1 No.	MSc in Statistics with knowledge in Computer or MSc in Data Analytics	2 Years

**NB: One technician for the operation of the Mobile CAAQMS shall be stationed in the Mobile Van for the operation of the CAAQMS.**

2.5.16 The O&M partner shall furnish an undertaking regarding carrying out satisfactory O&M of CAAQMS covered in this document as per the terms & conditions of the document on behalf

of the bidder. This information is to be provided as per Attachments 5 & 9 of Section III.

2.5.17 The Bidder and their Principal firm have to give an undertaking that they will continue the formal collaboration till the entire duration of O & M contract. The spares/consumables will be supplied by the Principal firm to the representative firm till entire duration of O & M contract of mobile monitoring vans / CAAQMS.

## **2.6 Bidding Procedure**

- (1) The Bidding will be in two parts, Part-1: Techno-Commercial Bid and Part-2: Financial Bid, which need to be submitted in tender Bidding procedure.
- (2) Both parts of the bid shall be submitted simultaneously by the stipulated date. The Techno-commercial Bid for Supply, Installation, Commissioning and O&M of CAAQMS will be opened and evaluated first and only the Bidders whose Technical Bids will have been found substantially responsive will be considered for opening of financial bid and will be notified by the JSPCB regarding the date and place to participate in the opening of the Financial Bid.
- (3) The Techno-commercial Bid shall consist of three (3) envelopes. The first envelope “A” will contain the Bid Security; the second envelope “B” will contain the qualification documents, and the third envelope “C” will contain the technical specifications pursuant to Clause 5 of these Instructions.
- (4) The Financial Bid shall consist of documents pursuant to Clause 6 of these Instructions.
- (5) The bidder must quote for the complete scope of work in a single package. In case the bidder does not quote for the complete scope of work, the bid shall be rejected at Techno-commercial evaluation stage.

The bidder shall bear all costs associated with the preparation and delivery of its bid, and the purchaser will in no case be responsible or liable for those costs.

## **3.0 BIDDING DOCUMENTS**

### **3.1 Issue of Documents**

A complete set of bidding documents can be downloaded by any interested eligible bidder from the website of <https://jspcb.org.in/>

### **3.2 Confidentiality of Documents**

All recipients of the Bidding Documents, regardless of whether the Bid is submitted or not, shall treat the details of the documents as private and confidential.

### **3.3 Check of the Bidding Documents**

Upon receipt of the Bidding Documents, the Bidder shall check the number of pages and drawings and notify the Board of any missing or duplicate pages and drawings or of any figures or words which may be indistinct or ambiguous.

No claim will be admitted as result of the Bidder's failure to comply with the foregoing. The address for the contact is specified in Sub-clause 3.5 of this Instruction.

### 3.4 Contents of Bidding Documents

(1) The Bidding Documents include:

#### Volume I:

1.	NOTICE	TENDER – INVITATION FOR BIDS
2.	SECTION I	INSTRUCTION TO BIDDERS
3.	SECTION II	SCOPE OF WORKS
4.	SECTION III	FORM OF TECHNO-COMMERCIAL BID
5.	SECTION IV	FORM OF FINANCIAL BID
6.	SECTION V	GENERAL CONDITIONS OF CONTRACT
7.	SECTION VI	SPECIAL CONDITIONS OF CONTRACT

#### Volume II

##### Technical Specifications

(2) Bidders must acquaint themselves with all the Bidding Documents embodied in Volume I and Volume II. In order to familiarize with the Works, the Bidders should ascertain all particulars regarding the location and site conditions at their own expenses. No plea attributed to lack of information or insufficient information will be entertained at any time.

The Authority shall reserve the right and privilege to settle the affairs in case any doubt may occur concerning the Bidding Documents.

### 3.5 Amendment of Bidding Documents

(1) At any time prior to the deadline for submission of the Bid, the Authority, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, may modify the Bidding Documents by amendment.

(2) For amendment in bidding documents or extension of bid submission date, if any, bidders are requested to visit website <https://jspcb.org.in/> before bid submission closing date. Authority will not publish any further notice in newspapers for such extension.

(3) The Authority will not be responsible or take any liability arising out of non- receipt of the same in time or otherwise.

(4) In order to allow prospective Bidders a reasonable time in which to take the amendment into account in preparing their Bids, the Authority, at its discretion, may extend the deadline for submission of the Bid.

## 4.0 PREPARATION AND SUBMISSION OF BID

**4.0 Language:** The Bid to be prepared by the Bidders, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Authority, or the Consultant shall be written in English. Failure to comply with this may disqualify a bid.

**4.1 One Bid per Bidder:** Each Bidder shall submit one Bid only.

#### **4.2 Local Representation**

(a) Foreign Bidders, if they have in India a local representative in Indian / Indian agent shall indicate in their bid (Bid Proposal Sheets), the name of such person of firm and also shall furnish the following information in their bid:

- i) The precise relationship between the Bidder and his Indian Agent.
- ii) The mutual interest which the Bidder and the Indian Agent have in business of each other.
- iii) Any payment which the Indian Agent receives in India or abroad from the Bidder whether as a commission for the Contract or as a general retainer fee.
- iv) Indian Agent's Income Tax Permanent Account Number.
- v) Bidder's Income Tax Permanent Account Number.
- vi) All services to be rendered by the Indian Agent whether of general nature or in relation to the particular contract.
- vii) All above statements have to be substantiated by authenticated documents from competent authority.

#### **4.3 Bid Security / Earnest Money**

(1) Pursuant to Clause 5.1 in this instruction, the Bidder shall furnish, the Bid Security amount of Indian Rupees ..... /-- (Rs. ....only (for all location) in the form of Bank draft or Bank Guarantee with validity as per Attachment No-10 of TCN in favour of the ....., payable at The NSIC registered companies (Explanation: Traders/ resellers/ distributors/ authorized agents will not be considered for availing benefits under PP Policy, 2012 for MSEs as per MSE guidelines issued by MoMSME) will be exempted from depositing EMD.

(2) The Bid securities in the form of Bank Draft in favour of the **Member Secretary, Jharkhand State Pollution Control Board, payable at Ranchi**, shall be valid for one hundred sixty-five (165) days from the date of opening of Techno-commercial Bids. This Bid Security shall provide security for the due performance by the Bidder of the obligations and undertakings in the Bid on his part contained.

(3) The Bid Security shall be submitted through Crossed bank draft or Bank Guarantee as per Attachment No-10 / in favour of the .....payable in ..... from a reputed Indian Nationalized Bank. Any Bid not secured by the Bid Security will be rejected by the Authority as non- responsive pursuant to Sub-clause 8.4. Unsuccessful Bidder's Bid Security will be discharged or returned as promptly as possible, but not later than thirty (30) days from the expiration of the period of the Bid validity specified in Sub- clause 4.5 hereunder. The successful Bidder's Bid Security will be discharged upon the

Bidder signing the Contract pursuant to Sub-clause 13.3 in this instruction and furnishing the Performance Security pursuant to Clause 14 in this instruction.

**(4) The Bid Security may be forfeited:**

- a. If a Bidder withdraws its Bid during the period of Bid validity specified in Sub-clause 4.5 hereunder;
- b. If a bidder refuses to accept the arithmetical corrections made according to ITB (Instructions to the Bidder) Clause No. 11;
- c. In case of a successful Bidder, if the Bidder fails to sign the Contract in accordance with Sub-clause 13.3 in this Instructions and furnish Performance Security in accordance with Clause 14 in this Instructions;
- d. In case bidder refuses to withdraw, without any cost to the Owner, those deviations, which the bidder did not state in the Deviation Schedules.

**(5) No interest will be payable by the JSPCB on the above Bid Security.**

**4.4 Validity of Bid:**

The bid shall remain valid and binding on the Bidder for one hundred twenty (120) days from the final time and date for submission of the Bid. Bid validity for a shorter period shall be rejected by the Authority as non-responsive.

In exceptional circumstances, the Authority may in writing or by facsimile, solicit the Bidder's consent to an extension of the period of the Bid validity. If the Bidder agrees to the request for extension, the Bid Security shall also be extended for an equivalent period of time.

Any Bidder may refuse to extend the validity of his Bid without forfeiting his Bid Security, but the Bid will not be considered.

Bidders granting the requests for extension of the Bid validity will not be required or permitted to modify their Bids.

**4.5 Rejection of Bid**

Failure by the Bidder to comply with the provisions of these Instructions to Bidders or any part of the Bidding Documents may result in rejection of the Bid and forfeiture of the Bid Security.

The Authority reserves the right to accept or reject any or all Bids or to amend the Bidding process at any time prior to award of the Contract without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Authority's action.

The Authority also reserves to itself the right of accepting the whole or any part of the Bid and the Bidder shall be bound to perform the same at the rate quoted.

**4.6 Contacting the JSPCB**

Except for responses to requests for clarification of the Bid by the Authority, the Bidder shall not contact the Authority for any matter related to this Bid from the time of submission of the Bid

until the Contract is awarded.

Any efforts by the Bidder to influence the Authority in its decision in respect of the evaluation of the Bid or the award of the Contract shall result in the rejection of the Bid and forfeiture of the Bid security

## **5.0 PREPARATION OF TECHNO-COMMERCIAL BID**

As per Clause number 6 of the Tender Notice.

### **5.0 Contents of Envelop “B”, Qualification Documents.**

The following documents shall be prepared in one (1) original and one (1) copy and be enclosed in a sealed envelope clearly marked “B” and “ORIGINAL” or “COPY” with the indication of contents.

- 1) Authorization letter authorizing the signatory of the Bid to commit the Bidder. (Power of Attorney to sign the Bid)
- 2) Attachments in support of meeting qualifying requirements as per Clause No. 2.5 for the quoted packages (Attachments 8A, 8B & 9 of Section- III).
- 3) Copy of certificate of local branch, sales, residential, and representative office(s) of the Bidder in India as per the certificate from pursuant to Attachment 2 of Section III.
- (Attachment-2: The bidder in its letterhead shall submit the details in Attachment-2 as sought for, including its experience in past O& M Contracts. Note: Only the details as sought for shall be filled in the prescribed format (Attachment- 2, and no supporting annexures shall be attached.
- 4) Certificate of letter of authority from manufacturers for all the Equipment (Attachment 3 of Section III).
- 5) Certificate from the manufacturer stating the country of origin of each Equipment duly authenticated by the competent authority of that country (Attachment 4 of Section III).
- 6) Certificate of carrying out O&M by O&M Partner (Attachment 5 of Section III).
- 7) List of Equipment offered (Attachment 6 of Section III).
- 8) List of Manufacturers of the equipment offered (Attachment 7 of Section III).
- 9) Pre-requisite for installation of equipment offered (Attachment 11 of Section III).

### **5.2. Contents of Folder “C”; Techno-commercial bid including Technical Specifications and Catalogs:**

The following documents shall be enclosed in the sealed envelope marked “C” and “ORIGINAL” or “COPY” with the indication of the contents. The Bidder shall prepare one (1) original and one (1) copy.

#### **1. Deviation Schedule (Attachment 12 of Technical Bid, Section-III).**

(In Attachment-12, the bidder shall submit his compliance to Technical Specifications (Annexure-I, Vol. II) for each of the items specified in the schedule of requirements. The compliance shall be submitted as per tabular format specified as Annexure-II, Vol-III. The bidder’s response to

the technical specifications shall be supported with TECHNICAL SPECIFICATION AND CATALOGS, and it shall be properly referenced with the page no. of the bidding document for easy access and for Technical Evaluation.

**2. Technical Data sheets of the Equipment in the package (Annexure-I, Vol. II) offered:**

- a) In case there is no deviation from the Authority's requirement, the Bidder must write down "complied" in the column for "Bidder's Response," supported with the Bidder's proposed specifications.
- b) In case of any deviation from the requirement, the Bidder must write down the "not complied" & the deviation in blanks under "Bidder's Response".
- c) The Bidder shall clearly indicate the contents and quantities of standard accessories for the proposed Equipment in the blanks.
- d) The Bidder shall understand that the decision of the JSPCB will be binding with regard to anything not specifically mentioned in the technical specification.
- e) The Bidders shall offer only one manufacturer, one brand, and one model.
- f) Complete set of original catalogues and/or photographs and/or pamphlets illustrating principal features.

**6.0 PREPARATION OF FINANCIAL BID**

**6.0 Preparation of Financial Bid:** The Bidder shall enter a price or rate against all the forms specified in the following Sub-clauses from 6.2 to 6.5 and Attachments in Section IV, and the same documents shall be submitted in a separate sealed financial packet "C" only.

**6.1 Bid Form:**

The Bid Price to be quoted by the Bidder shall be prepared on the official letterhead of the respective Bidder according to the Attachment-1 "Bid Form" in Section IV without any alteration or change.

The Bid Price shall be quoted for performing the Contract strictly in accordance with the Technical Specifications.

The Bid Price quoted by the Bidder shall be firm during the Bidder's performance of the Contract and not subject to variation on any account.

**A Bid Price submitted with an adjustable price will be treated as non- responsive and will be rejected.**

**6.2 Summary of Bid Price**

A summary of Bid Price shall be prepared and submitted in accordance with Attachment 2 in Section IV.

The unit rates and the prices shall be quoted by the bidder separately (in BoQ). The bid shall be submitted only in INR.

The Bidder shall indicate prices for the package in the following manner:

1. For the Goods Supplied from India, including imports (if any)
  - a) The price of the Equipment quoted FOR destination/ site.
  - b) Installation and commissioning charges
  - c) Price of other incidental costs, if any. Then the Bidder shall specify the same.
2. Price of other incidental cost such as Indian Agent's Commission, if any. The Bidder shall specify the same.
3. Cost of O&M of MCAAQMS for Five (5) years, including insurance.
4. Training:

The Bidder shall quote the price for the training as indicated in clause 10 of Scope of Works.

Cost of Travel, Boarding & Lodging and local transport cost of participants shall be borne by the Bidder.

**\*Note :**

- i. The quoted cost O&M of a Mobile CAAQMS for each year should be at least 12% (excluding GST) of the cost of supply & installation of the Mobile CAAQMS. In case the bidder quotes O&M cost lower than 12% (excluding GST) of the supply & installation cost, the Owner will reduce the supply & installation cost suitably, so as to make the O&M cost as 12% (excluding GST) of the supply & installation cost keeping the total quoted cost as unchanged.
- ii. GST on supply & O&M charges as applicable shall be paid extra as actual the Authority.
- iii. The above ceiling O&M cost also includes incidental charges (Security, Electricity, Data Connectivity, Stations Supervisor, insurance) and services.
- iv. The health of the Stations should be sound for the entire period (05 years) so that the contract can be further renewed on mutual agreement.

### **6.3 Bid Price Breakup**

The Bidder shall prepare and submit the Bid Price (Excluding all taxes) and currency as per the BoQ available in a sealed envelope for each item.

**a. Currencies of Bid:**

The unit rates and the prices shall be quoted by the bidder separately (in BoQ). The bid shall be submitted only in INR.

## **7.0 COMPLETION AND SUBMISSION OF BID**

### **7.0 Completion of Bids**

#### **7.0.1 Techno-commercial Bid**

- (1) The Techno-commercial Bid shall not contain any information regarding Bid Prices and other financial matters except the Bid Security pursuant to Clause 4.4 in this instruction.

#### **7.0.2 Financial Bid**

The Bidder shall submit the Price Bid in BoQ available in sealed envelope.

### **7.0.3 Submission of Bid**

All the documents for the Techno-commercial Bid and Financial Bid shall be submitted in separate sealed envelopes and both the envelopes shall be placed inside a single sealed envelope. Also, hard copies of supporting documents of Bids shall be submitted manually to JSPCB and the bids shall be addressed to:

The Member Secretary,

Jharkhand State Pollution Control Board,

T.A Division, HEC Complex, Dhurwa, Ranchi- 834004.

The Bids received after the specified time and date above for whatever reason shall not be accepted online by the system.

Bids in the form of Telex, facsimile, telegraph or email, will not be accepted.

The Bids once opened shall not be returned to the Bidders regardless of the result of the Bid.

This will apply to both the Techno-commercial and financial bids in case a bidder is not qualified at the stage of Techno-commercial evaluation.

## **8.0 OPENING AND EVALUATION OF TECHNO-COMMERCIAL BID**

### **8.0 Opening of Technical Bid**

Only the Technical Bid will be opened at JSPCB on the stipulated date. Bidders or their representatives may attend the opening.

All the Bidders or their representatives present shall sign a format evidencing their attendance.

The representative shall submit a letter of authorization from the respective bidders.

### **8.1 Confidentiality of the Process**

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of the contract shall not be disclosed to bidders or any other person not officially concerned with such process. Any effort by a bidder to influence the Authority's processing of Bids or award decisions may result in the rejection of the Bidder's Bid. The request for clarification and response shall be in writing or by email, but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Authority in the evaluation of the bids in accordance with the clause 11.2 of these instructions.

### **8.2 Clarification of Techno-commercial Bids**

To assist the Techno-commercial examination and evaluation of bids, the Authority may, at its discretion ask the bidder for a clarification of its Techno-commercial bid.

### **8.3 Preliminary Examination**

The Authority will examine the Techno-commercial Bids to determine whether they are complete, whether the documents have been properly signed and whether the Techno-commercial Bids are generally in order. Any Techno-commercial Bid found to be non-responsive for any reason i.e. non-conformity of bid security, or not meeting the eligibility criteria and/ or qualifying requirements pursuant to clause 2.4 & 2.5 of ITB etc. will be rejected by the Authority. No further Techno-commercial evaluation shall be carried out for such bidders.

No deviation, whatsoever, is permitted by the Owner to the provisions relating to the following clauses (important Conditions):

- (a) Bid security (ITB Clause 4.4)
- (b) Resolution of Disputes (G.C.C clause 36),
- (c) Applicable law (G.C.C clause 41),
- (d) Taxes & duties (G.C.C Clause 37),
- (e) Performance security (ITB Clause 14 & GCC Cl.27),
- (f) Force Majeure (G.C.C Clause 34).

A bid with deviation from any of the above clauses (important Conditions) will be liable to be rejected.

The Owner's determination of bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence. If a bid is not substantially responsive, it will be rejected by the Owner, and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

### **8.4 Evaluation of Techno-commercial Bid**

- (1) The Authority will determine the responsive Techno-commercial Bids for the invitation of opening of Financial Bid if the Techno-commercial Bid meets satisfactorily technical specification and any other information, which they consider relevant to his offer.
- (2) If a Bidder is found not substantially responsive to the technical requirement, the Techno-commercial Bid will be rejected and the subsequent information as to opening of the Financial Bid will not be notified.
- (3) If the Techno-commercial clarifications are required by the Authority to any part of the Techno-commercial Bids, the Bidders will be requested to clarify the same in writing.

### **8.5 Evaluation Criteria of Techno-commercial Bid**

The Bidder who fulfills the requirements specified under Qualification Requirement (Clause 2.5) will be short listed. Under the Qualification Requirement a minimum threshold limit has been set for each parameter like technical experience and financial strength. Bidders not meeting the minimum threshold limit in any of these parameters will not be short-listed.

**The detailed techno-commercial evaluation to be carried out shall be restricted to these short-listed Bidders only.**

## **9.0 NOTIFICATION OF SUCCESSFUL TECHNO-COMMERCIAL BID**

After completing the techno-commercial evaluation of the Techno-commercial Bid, Financial bid will be opened.

### **10.0 OPENING OF FINANCIAL BID**

Opening of the financial envelop will be communicated to the qualified bidder through letter or SMS or Mail.

### **11.0 EXAMINATION OF FINANCIAL BID**

**11.0** After opening of the Financial Bid, the JSPCB will examine them to determine whether they are complete, signed, generally in order, and substantially responsive to the Bidding Documents or not. A Financial Bid determined as being not substantially responsive will be rejected.

The JSPCB may waive any minor informality or non-conformity or irregularity in a Financial Bid which does not constitute a major deviation or reservation, provided such waiver does not prejudice or affect the relative ranking of any Bidder. If there is any discrepancy between words and figures, the amount in words will prevail. The Financial Bid, which is incomplete or conditional, will be rejected.

The Financial Bid shall not be returned to the Bidder regardless of the result of the Bid.

**11.1** During examination of Financial Bid any arithmetical errors will be corrected as follows:

- a) If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected accordingly.
- b) The amount stated in the Form of Bid shall be adjusted by the JSPCB in accordance with the above procedure for the correction of errors and, shall be considered as binding upon the bidder. If the bidder does not accept the corrected amount of bid, its bid will be rejected, and the bid security will be forfeited in accordance with clause 4.5 (5).

## **12.0 EVALUATION AND COMPARISON OF FINANCIAL BID**

### **12.0 Evaluation Procedure:**

The Authority will evaluate the Bid previously determined to be Techno-commercially responsive pursuant to clause 8.6. The Authority reserves the right to reject any bid or bids received at its discretion without assigning any reason whatsoever.

**12.1** The purchaser's evaluation of a bid will take into account the following factors:

- I. Total cost of supply, installation & commissioning at the identified city/location of the equipment as below:**

- 1) The price offered for the supply of the equipment & vehicle (such price includes all costs as well as duties and taxes paid or payable on components and raw material incorporated or to be incorporated in the equipment)
- 2) O&M cost (including insurance) for five years as Net Present Value discounted@12% per annum. NOTE: Taxes like GST shall be extra payable by the owner and will not be considered for price bid evaluation.

12.1.1 The Authority will evaluate and compare the Bid for all stations as a complete package, which covers all items as specified under the clause Schedule of Requirement in the Scope of Works.

## **12.2 Clarification on Financial Bid:**

For examination, evaluation and comparison of the Financial Bid, the JSPCB may, at his discretion, request the Bidder in writing to clarify its Financial Bid, but no change in the Bid Price or substance of the Bid will be sought, offered, or permitted.

## **12.3 Cost Compensation for Deviations**

Deviations specifically declared by the bidders in the respective Deviation Schedule (Attachment 12 of Technical Bid, Section – III) only will be taken into account for the purpose of evaluation.

In case of any of these deviations are not acceptable to the Owner, the Bid shall be rejected. In case any of the deviations are acceptable to the Owner, the Owner will make its own assessment of the cost of these deviations and consider it for evaluation for the purpose of ensuring fair comparison of bids.

Bidders may note that all deviations/variations and additional conditions etc. found elsewhere in the bid other than those stated in the Deviation Schedules, save those about any rebates, shall not be given effect to in evaluation, and it will be assumed that the bidder complies to all the conditions of the Bidding Documents. In case bidder refuses to withdraw, without any cost of the Owner, those deviations, which the bidder did not state in the Deviation Schedules, the bid shall be rejected, and the bid security of the bidder may be forfeited.

## **13.0 AWARD OF CONTRACT**

### **13.0 Award of Contract to Successful Bidder**

The Authority will award the Contract to the successful Bidder:

1. Whose Bid will be determined to be substantially responsive to this Bidding document and who will be determined by the Authority, to be qualified technically, financially and otherwise in respect of such other capabilities, as the JSPCB may be deem necessary and appropriate to satisfactory performance of the Contract and
2. Whose Bid will be determined to be lowest evaluated, responsive Bid and is determined to be qualified to satisfactorily perform the contract.

3. The Authority reserves the right to reject any bid or bids received at its discretion without assigning any reason whatsoever.
4. The Authority reserves the right to modify the tendered quantity, either by increasing or decreasing it, or by reordering the same scope of work, within one year from the date of the Letter of Intent (LOI). Any adjustments in quantity for reorder will be made under the same tender conditions and at the same tendered price, as deemed necessary.
5. The period of validity of the rate would be extended for another year with the mutual consent.

### **13.1 Notification to Award**

Prior to the expiration of the Bid validity pursuant to sub-clause 4.5 in these Instructions, the Authority will notify the successful Bidder in writing by registered letter or by facsimile to confirm that its Bid has been accepted.

The notification of award will constitute the formation of the Contract.

Upon the successful Bidder's furnishing of the Performance Security pursuant to Clause 14 the Authority will promptly notify each unsuccessful Bidder and will discharge their Bid Security pursuant to Sub-Clause 4.4.

### **13.2 Signing of Contract**

Within Thirty (30) days of the receipt of notification of award from the Authority, the successful Bidder shall sign and date the Contract. The Contract shall take the form of General and Special Conditions attached to Sections V, VI, and such modifications as may be necessary. The Bidder shall prepare at his own cost one (1) original and three (3) bound copies of the Contract, including the Contract Form attached to the Special Conditions of Contract (Attachment 3 of Section VI) for distribution to the parties concerned.

### **14.0 PERFORMANCE SECURITY**

Within thirty (30) days of notification of award from the JSPCB, the successful Bidder shall furnish the Performance Security in the form of Bank Guarantee issued by a reputed bank (as per enclosed list of **Attachment – 15**) having license to do business in India in accordance with Attachment-1” Performance Security Form” provided in Special Conditions Contract for an amount equivalent to 3% (three percent) of the Contract Price, for one year after successful commissioning of system.

Failure of the successful Bidder to comply with the requirement of Sub-clause 13.3 or Clause 14 in these instructions shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security, in which event the JSPCB may make the award to the second highest-ranked Bidder or call for new Bids.

### **15.0 EXPENSE OF BID**

Under no circumstances will the Authority be liable to the Bidder for any expenses, losses or

damages whatever incurred in the Bid, including but not limited to expenses, losses or damages associated with preparation of the Bid, visits to the Sites, and all matters in connection with the Contract negotiations and signing, regardless of the conduct or outcome of the bidding process.

**16.0 RESPONSIBILITY FOR INFORMATION SUPPLIED**

Prior to the final time and date for submission of the Bids, no representation, communication, explanation or statement, verbal or written, made to the Bidder or anyone else by the Bidder or any of their employees or authorized representatives other than as may be set out in amendment issued in accordance with Sub-clause 3.6 in this Instructions shall bind the Bidder in the exercise of their powers and duties under the Contract.

The information given in the Bidding Documents is the best in the possession of the Authority, but the Authority does not hold himself responsible for its accuracy.

**VOLUME - I**  
**SECTION II**  
**SCOPE OF WORKS**

<b>S No.</b>	<b>PARTICULARS</b>	<b>Page No.</b>
1	Details of Project Structure	28
2	Scope of Services	31
3	Minimum Specifications	32
4	Desired Output for CAAQMS Equipment	32
5	Data Management and Quality checks	32
6	Location	33
7	Supply of Equipment	34
8	Installation of Equipment	34
9	Inspection and Test	34
10	Provision of Training	34
11	Operation & Maintenance of Air Monitoring Stations	35
12	Schedule	39
	Attachment 1: Equipment List	40
	Attachment 2: Protocol Manual Calibration	43-44
	Attachment 3: Daily Reporting Format for Meteorological Parameters	45
	Attachment 4: Monthly Reporting Format for Meteorological Parameters	46
	Attachment 5: Daily Reporting Format for Main Pollutants	47
	Attachment 6: Monthly Reporting Format for Main Pollutants	48

## 1.0 DETAILS OF PROJECT STRUCTURE

- (a) The Monitoring Van is designed to be used for monitoring of ambient air quality. This shall build on the Tata Cabin Chassis model TATA 1616 LPT or its equivalent, BS-VI variant with driver cabin and Instrument Cabin. The Instrument Cabin shall be air conditioned and able to maintain a constant temperature, so that the analyzer.
- (b) The successful bidder would be awarded the project/work under a Supply and Service Agreement, which would entail:
  - 1. Supply of Vehicle model number TATA 1616 LPT or its equivalent, BS-VI variant (02 nos.): - The procurement of 02 numbers of Vans along with chassis (Vehicle Frame) and Supply, installation, and Commissioning of One Set of air quality monitoring analysers system will be in the scope of the bidder. The Bidder would provide a complete set of Mobile Continuous Ambient Air Quality Monitoring Van ready to monitor the continuous ambient air quality wherever required.
  - 2. Supply, installation, and Commissioning of One Set of MCAAQV at the defined cities/ locations.
  - 3. Operation and Maintenance of the CAAQMS for a period of 5 years from the date of its commissioning
  - 4. Daily reporting of data pertaining to Ambient Air Quality to JSPCB. The authorities would make payment for MCAAQMV as per the schedule of requirements, for Supply, Installation and Commissioning of the system. The authorities would procure all the MCAAQMV equipment on its name. The Authority will make regular payments for the O&M and supply of Data at the end of each Quarter. The bidders therefore need to quote two prices for;
    - (a) Supply of TATA 1616 LPT or its equivalent, BS-VI variant (total 02 nos.) along with chassis (Vehicle Frame) to be used as instrument cabin (air conditioned) and ready for analyzers to be fitted in the instrument cabin.
    - (b) Supply, Installation and Commissioning of the analyzers system, total of 2 Nos. each in each MCAAQMV as per invitation for bids section.;
    - (c) Reporting of data to Authority. The price for the data supply would include the Operation and Maintenance, including incidental charges, electricity, manpower, security, etc.

These vans will be stationed at Regional Offices of JSPCB. Bidder would bear the initial installation and commissioning cost for these facilities and the monthly recurring cost

pertaining to their usage (monthly telephone) would also be borne by the Successful Bidder.

**(c) SCHEDULE OF REQUIREMENTS**

Each MCAAQMV shall have the following schedule of requirements. The system should be completely functional. Any balance of material not specified but required for the purpose must be supplied by the bidder.

<b>Sl. No.</b>	<b>Name of the instrument/ Equipment/ Item</b>	<b>Quantity (Nos)</b>
1.	Continuous Ambient Carbon Monoxide (CO) Analyzer	One
2.	Continuous Ambient Sulphur Dioxide (SO <sub>2</sub> ) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen (NO/NO <sub>2</sub> /NO <sub>x</sub> ) Analyzer	One
4.	Continuous Ambient Ammonia (NH <sub>3</sub> ) Analyzer	One
5.	Continuous Ambient Ozone (O <sub>3</sub> ) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM <sub>10</sub> Particulate Matter Monitor	One
8.	Automatic PM <sub>2.5</sub> Particulate Matter Monitor	One
9.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
10.	Multi-calibration systems for Gas Calibration and Meteorological, Flow and Electronic Calibration	One Set
11.	Sensor based instrument to measure Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank- up Meteorological Tower.	One Set
12.	Computer system consisting of one PC along Colour Laser printer with latest specification, and DAS at the monitoring station with peripherals. Software for data acquisition/ Data transfer and system integration, telephone, Modem.	One Lot
13.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analysers with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line Fittings, Tools (electrical and mechanical).	One Unit
14.	Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and	One Unit

	thermally stable instrument cabin.	
15.	Air Conditioner, Split Type, Roof Mounted along with voltage stabilizer (2 x 2 ton)	Two Unit
16.	6.5 KVA petrol generator (2 nos.)	One Unit
17.	Online UPS (1x5 KVA, 2 Hours backup)	One Unit
18.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analyzers with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line Fittings, Tools (electrical and mechanical).	One Set
19.	<p><b>G.P.S. SYSTEM</b></p> <p>The van should have GPS tracking facility and Wi-Fi facility so that its movement can be monitored from Head Office. Integrated GPS &amp; 3G modules for location tracking and wireless communication</p> <p>To operate with GPS / GSM / GPRS wireless network - GPS chipset with high sensitivity</p> <p>GPRS with sim card.</p> <p>Intelligent activation of GPS positioning</p> <p>To start working automatically after electrifying - Built-in ON / OFF power, wide voltage input range - Built-in monitoring CPU, eliminating breakdown automatically</p> <p>Commands and location information received by SMS</p> <p>Easy to install, open or hidden installment alternatives</p> <p>Two power input approaches: car-specific joint or car battery -</p> <p>Antenna: Built-in GSM, GPS antenna with low noise and high gain.</p>	As Specified
20.	<p><b>Seating arrangement:</b></p> <p>The basic van provided by the client shall be with company fitted driver seat +1 seat. Additional two seats, with Seat belts, shall be provided as under:</p> <p>All the seats shall be firmly fixed and secured properly. - Seats shall have capacity to bear 400 kg weight.</p> <p>All seat cushions shall be of good conditions with new soft upholstery. Prior approval for material quality and make shall</p>	As Mentioned

	be taken from engineer in charge.	
<b>21.</b>	<p>Fresh Water Tank and Drain Water Tank and Wash basin</p> <p>Fresh water overhead storage Tank of about 50 liters (plastic) shall be fixed on the top of the roof of the van.</p> <p>The drain water tank (15 ltrs) shall be made of 3mm thick, food-grade plastic, to be mounted underneath the platform table.</p> <p>Total 2 such tanks shall be provided (One for inlet water supply to the wash basin tap and the Second for the collection of wastewater from wash basin)</p> <p>The wastewater tank should be fitted with a controlled drainage facility to drain the wastewater as and when required.</p> <p>Both the Tank shall be easily removable for any sort of Maintenance and cleaning purposes</p> <p>Wash Basin: Stainless Steel (SS) wash basin with SS water tap for supplying water.</p> <p>A separate 0.5 HP pump (to be operated on external electricity) to fill-up the overhead water tank shall be provided and fixed at the appropriate place, near the washbasin. Prior approval for material quality and make shall be taken from the engineer in charge</p>	1+1 (W) total 2
<b>22.</b>	<p>Fire extinguisher mounting: A proper heavy-duty bracket support (powder-coated on MS structure) should be provided beside storage 1 for placing a fire extinguisher. 1 No. of 2 Kg capacity in Driver cabin and 1 no of 6 Kg in the laboratory area.</p>	2 Units
<b>23.</b>	<p>First aid kit: Cotton rolls, Iodine, Scissors, Boric acid powder, Band aid strips. All other accessories and medical facilities.</p>	One Unit

## 2.0 SCOPE OF SERVICES

The Scope of Works under the package shall include:

- A) Vehicle model number TATA 1616 LPT or its equivalent, BS-VI variant along with vehicle frame (Chassis build up): The Monitoring Van designed to be used for monitoring of ambient air quality. This shall build on Tata Cabin Chassis model TATA 1616 LPT or its equivalent, BS-VI variant with driver cabin and Instrument Cabin. The Instrument Cabin shall be air conditioned and able to maintain constant temperature, so that the analyzers are easily accessible front and back for calibration and maintenance.

- B) The supply, including packing, transportation, insurance, custom clearance, port clearance and handling, inland transportation, inland transit insurance, and delivery to site, installation, testing, and commissioning of equipment, and provision of training of JSPCB officials station-wise.
- C) O & M of CAAQMS Analyzers and Mobile Vehicle: Operation & Maintenance of Air Monitoring Systems along with Mobile Vehicle for a period of five (5) years from the date of commissioning of the station, which can be extended up to three (3) years at the mutually agreed rates and terms and conditions.
- D) Data & Report of data about CAAQMS to JSPCB.
- E) Online transfer of data as directed by the JSPCB server.

Other services involved with the performance of the Works are specified in the General and Special Conditions of Contract of bid document.

### **3.0 MINIMUM TECHNICAL SPECIFICATIONS**

The minimum technical specification requirements for the MCAAQMV to be installed are given in Volume – II (Technical Specifications) of the bid documents. However, the actual technical proposal can have higher or better technical performance parameters and the minimum specifications proposed should not be taken as a constraint on the upper side. The technical specifications given in Volume – II (Technical Specifications) of bid documents are descriptive and Selection Committee can consider technical proposals having similar specifications.

### **4.0 DESIRED OUTPUT FOR CAAQMS EQUIPMENT**

The desired output requirements from the MCAAQMV equipment to be installed at are given in Attachment 2 to 6 of Scope of work of bid document.

### **5.0 DATA MANAGEMENT AND QUALITY CHECKS**

Data shall be collected and validated according to US EPA standards/National Ambient Air Quality Standards using the methodologies included in 40 Code of Federal Regulations. All analyzers shall have current US EPA reference or equivalent method designation (Except BTEX and NH3) and shall be of the latest model and design and a certificate in this regard also needs to be submitted.

The successful bidder shall submit a Standard Operating Procedure for the air quality monitoring station to the JSPCB before the award of the contract. This Standard Operating Procedure shall be approved by the Authority before award. The Standard Operating Procedure shall contain the following:

- Operating procedures for all analyzers (Transmitters and sensors)
- Calibration procedures
- Calibration schedule
- Maintenance procedures

- Maintenance schedule
- Data validation procedures
- Data reporting as per attachments X1 to X5
- Data obtained from these calibration checks and copies of associated Quality Assurance and calibration documentation shall be submitted to the JSPCB along with the Air Quality Data.
- Inventory of spares and consumables to be maintained and recorded from time to time and a buffer stock for any eventuality to be maintained.

Upon 3 days' notice from the Authority once per year, Successful Bidder shall agree to submit to an audit of calibrations, conducted using pre-approved USEPA or manufacturer's standard methodologies, by a third party. Third-party audit will be arranged by the Owner by the agency decided by them, at their cost and bidder shall provide all necessary facilities to carry out the required audit. The results of these audits shall be made immediately available to both the Successful Bidder, Seller and Buyer.

The operator shall participate in the Proficiency Testing Exercise organized by a reputed organization.

#### **GENERAL GUIDELINES**

- **Working Hours:** The site for MCAAQMV operation should be maintained to work- manned by the employees of the Successful Bidder for 24 hours a day. In addition, the Successful Bidder would arrange for a security of the site and equipment through appointment for security agency (providing at least one security guards) throughout the day.
- **Insurance:** Successful Bidder would bear the cost of insuring the equipment (Comprehensive) and facilities against any theft, fire and other applicable provisions during tenure of contract period, including O&M.
- **Station platform, pillars, Electricity & telephone/modem arrangement:** The successful bidder shall construct a station/container for housing the analyzers, platform pillars etc. as required and shall also arrange electric and telephone connection modems etc. required for the smooth Operation of the station. The necessary documentation shall be provided by the JSPCB.

#### **6.0 LOCATION**

The location of the MCAAQMV shall be decided by the Authority and city-wise areas under:

<b>SI No.</b>	<b>Location and City</b>	<b>Number of Mobile CAAQMS</b>
<b>1.</b>		
<b>2.</b>		

<b>3.</b>		
<b>4.</b>		
<b>5.</b>		

## **7.0 SUPPLY OF EQUIPMENT**

Attachment-1, specifies the list of equipment in the package, quantity of equipment to be supplied, delivered and installed.

## **8.0 INSTALLATION OF EQUIPMENT**

All the necessary arrangements and adjustments for suitable installation and operation of the Mobile CAAQMS shall be made by the Bidder, however all the required documents shall be arranged by the Authority.

## **9.0 INSPECTION AND TEST**

### **9.1 Unpacking Inspection**

The Contractor shall inspect at Site whether all the Equipment are packed in conformity with the Equipment list and packing list without any damage immediately after arrival of the Equipment at each Location.

### **9.2 Performance Test**

The Contractor shall carry out the performance test for all the Equipment supplied under the scope of work of this document.

In case the Equipment for the performance test requires supplemental and/ or supporting Equipment, the Contractor shall carry out the performance test, including such Equipment.

## **10.0 PROVISION OF TRAINING**

The supplier shall provide the training to the JSPCB staff for minimum two (2) weeks to five (5) persons (maximum) after the performance test and commissioning. Training should include but not limit to the following:

- 1) Inspection of the Equipment.
- 2) Precautions in use of the Equipment.
- 3) Basic measurement principle.
- 4) Principles of operation of the Equipment.
- 5) Start-up and shutdown procedure.
- 6) Operation of the Equipment.
- 7) Calibration method.
- 8) QA/QC.
- 9) Data Validation & management and software application.

- 10) Safety precautions.
- 11) Basic maintenance procedure.
- 12) “Do’s” and “Don’ts” in operation of the Equipment.
- 13) Handling of hazardous chemicals and gas.
- 14) Others, which are deemed to be necessary by the Supplier.

In case the Equipment for training requires supplemental and/or supporting Equipment, the Supplier shall carry out the training including such Equipment. The Supplier shall discuss and finalize the detailed contents and schedule of the training program in consultation with the JSPCB during installation of the Equipment.

The Supplier shall furnish the training manual and/or CD as required for training for all the Equipment supplied under the scope of work of this document. Contents of training manual and/or CD for the Equipment are as follows:

1. Principle of the Equipment.
2. Operation and calibration of the Equipment.
3. Maintenance and basic repair of the Equipment.
4. Safety instruction of the Equipment.
5. Others, which are deemed to be necessary by the Supplier.
6. QA/QC, Data Validation & management and software Application

## **11.0 Operation & maintenance of Mobile Continuous Ambient Quality Air Monitoring Stations**

**11.1** The Contractor’s responsibilities shall include without limitations the following works to be carried out on the Mobile Continuous Ambient Air Monitoring Stations installed under this Contract during the Operation & Maintenance of the stations:

- a) Operation and Maintenance of all the commissioned equipment’s and amenities as supplied by the Manufacturer under the Contract including services during forced and planned outages and overhauls.
- b) The Contractor shall take over the entire Mobile Air Monitoring Station (including all equipment) for O&M after execution of Indemnity Bond as per format placed at Attachment- 13, Section III of bid document.
- c) The Contractor shall provide to the owner a monthly summary of all operation and maintenance activities performed by the contractor during each month.
- d) Operation and Maintenance Obligations: In implementing its obligations to operate and

maintain the facility under this Contract, the Contractor shall:

- i) Undertake comprehensive maintenance including i.e. schedule and breakdown maintenance & repair at site and keep JSPCB Informed regarding status of equipment and forward daily data as per Attachment 3 of Section – II.
  - ii) The operation and maintenance of the Mobile vehicle along with chassis build-up (TATA 1616 LPT or its equivalent, BS-VI variant along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin) would be the responsibility of the supplier and would ensure the maintenance of the vehicle as per the standard procedure / schedule prescribed by the manufacturing company and as per the laid-out standards in the operating manual of the vehicle.
  - iii) Obtain permission from the owner and inform the O&M for any assistance for which equipment is required to be sent to the works. The contractor shall arrange substitute equipment to keep MCAAQMSV operational.
  - iv) Take reasonable action to assure that the Personnel deployed at Air Monitoring Vans and any subcontractors and agents are provided with a workplace in compliance with applicable Law.
  - v) Keep the Mobile Air Monitoring Vans clean, well maintained and in good working condition.
  - vi) Security: It is the duty of the Contractor to secure the movable, immovable and other properties of the Owner at the Air Monitoring Station. The Contractor shall indemnify the loss caused to the Owner on account of any damage, loss or theft caused to the property of the Owner.
  - vii) Scheduled Maintenance: Unless Owner and Contractor mutually agree otherwise, perform all required Scheduled maintenance for all equipment, auxiliaries etc., in accordance with the O&M specifications.
  - viii) Unscheduled Maintenance: Perform all Unscheduled Maintenance and repairs for all equipment, auxiliaries etc. within (24) hours of the operator shall provide the Owner with detailed written information on nature of the repair or replacement to be carried out, estimated down time and other necessary details as required.
  - ix) The Contractor shall source all the spares required for maintenance & repairs of the installed equipment from O&M only.
- e) The Contractor's responsibilities shall include without limitations the following works to

be carried out on the Mobile Continuous Ambient Air Monitoring Vans installed under this Contract during the Operation & Maintenance of the stations:

- i. Operation and Maintenance of all the commissioned equipment's and amenities as supplied by the Manufacturer under the Contract including services during forced and planned outages and overhauls.
- ii. The Contractor shall take over the entire Mobile Air Monitoring Van (including all equipment) for O&M after execution of Indemnity Bond as per format placed at Attachment- 13, Section III of bid document.
- iii. The Contractor shall provide to the owner a monthly summary of all operation and maintenance activities performed by the contractor during each month.
  - f) The Operator shall not:
    - i) Make any modifications as to the Mobile Air Monitoring Stations, other than in an Emergency, without the prior written approval of the Owner, or
    - ii) Dispose of any assets, settle law-suits or engage in transactions relating thereto on the Owner's behalf without the prior written approval of the Owner.
  - g) The Contractor shall purchase spare parts, materials, supplies and other consumable items, and maintain an inventory thereof, for the Mobile Air Monitoring Stations. All such material supplied, and other items shall be the property of the Contractor. However, all the spares shall be sourced from OEMs only.
  - h) The Contractor shall review all applicable Laws and initiate and maintain such prosecution, procedures and operating plans relating to operation of the Mobile Air Monitoring Stations as are necessary to comply therewith or assist the owner in complying therewith as the case may be.
  - i) The Contractor shall operate the equipment as per the laid-out standards in the operating manual of the equipment and providing data for ambient air to SPCB on daily basis in the suggested format. The daily monthly and yearly Reporting Formats are attached **Annexure X1 to X5**
  - j) The Mobile CAAQMS has to be plied & operated based on the duration, day and location intimated by the Board, and should be operated for a minimum of 85% of the total sampling days in a year, and should not be inoperable for more than 7 days at a stretch.
  - k) Provide data collected through operation of the equipment on daily basis in suggested output formats given in the bid document:
    - i. Establish and maintain a daily and monthly and yearly reporting system to provide storage and ready retrieval of operation and maintenance data including such

information necessary to verify calculations. The monthly reporting shall contain variances from targets.

- ii. Provide access to the owner to the Air Monitoring Stations and their data at all reasonable times and as and when required. Provide the operational data required to all competent authorities including, Government of India or concerned State Governments as directed by JSPCB.
  - iii. Online transfer of data to JSPCB web site/ server.
  - iv. The Contractor shall ensure accuracy of the data provided as per standards.
- l) These Mobile CAAQMV will be stationed at the different locations specified by Regional Offices/Head Office of JSPCB. Bidder would bear all the cost including installation, commissioning and operation cost for usage of CAAQM Systems. (except fuel charges, toll/fastag charges, electricity charges would be borne by the JSPCB Board on actual basis.)
  - m) Salary/Wages and expenses of the Driver handling the Mobile CAAQMS will be in the scope of JSPCB., However the technician charges for operation of Mobile CAAQMS will be in the scope of Bidder.
  - n) The contractor shall ensure periodic re-calibration of all the equipment as per manufacturer's instructions and maintain "Protocol Calibration" as per **Attachment 2 of Section II.**

**11.1.** Owner shall arrange for the following and Contractor shall guide and assist the Owner:

- i) The Owner shall pay O&M charges to the Contractor at the end of each quarter after submission of validated data & report by the Contractor, in accordance with the payment terms detailed in Special Conditions of Contract.
- ii) Owner shall pay all fees including applicable Taxes, etc., imposed upon Owner by the Applicable Law pertaining to works under this contract.
- iii) The Owner shall identify and hand over the site for erection & commissioning of Air Monitoring Stations free from all encumbrances.
- iv) The Owner shall make the arrangement for letter / documents for operation of MCAAQMV at the specified location for sampling.
- v) Fuel charges, toll/ fastag charges, electricity charges would be borne by the Board on actual basis
- vi) Salary/Wages and expenses of the Driver handling the MCAAQMV will be in the scope of

JSPCB. However, the technician charges for operation of MCAAQMV will be in the scope of Bidder.

vii) The valid data capture rate should be minimum 85%. The full payment shall only be made if validated data is 85% or more and all the quarterly reports/ calibration protocol maintenance scheduled, and spare parts/ consumable replacement document are maintained and verified by the owner/ JSPCB. The contractor has to maintain records /Receipts/ bills paid available as and when required.

### **11.2. Handing Over of Mobile Van:**

On expiry/closure/termination of the Contract Agreement, Vans shall be handed over to Board in working condition to the satisfaction of Board. Few or all the spares procured by the Contractor and unused as on date of handing over may be purchased by the Owner at their discretion provided Contractor is able to provide reasonability of the costs of such spares. In addition, the Contractor shall provide consumables equivalent to three months consumption on expiry/closure/termination of the Contract Agreement without any extra financial implication.

## **12.0 SCHEDULE**

**12.1** Contractor shall complete all activities covered in the scope of work up to installation & commissioning of Mobile Continuous Ambient Air Quality Monitoring Vans within 180 days from date of opening of Letter of Credit.

**12.2** The Contractor shall carryout Operation & Maintenance of Air Monitoring Systems along with Mobile Vehicle for a period of five (5) years from the date of commissioning of the system, which can be extended up to three (3) years at the mutually agreed rates and terms and conditions.

**12.3** The operation and maintenance contract shall be executed by the Member Secretary, or authorized officer JSPCB having jurisdiction or the area under his control. The term and condition shall be governed as per the tender document. The Member Secretary of JSPCB or any person authorized by him shall be the ultimate consignee.

## ATTACHMENT 1

### EQUIPMENT LIST FOR 1 (ONE) MCAAOMV

Sl. No.	Name of the instrument/ Equipment/ Item	Quantity (Nos)
1.	Continuous Ambient Carbon Monoxide (CO) Analyzer	One
2.	Continuous Ambient Sulphur Dioxide (SO <sub>2</sub> ) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen (NO/NO <sub>2</sub> /NO <sub>x</sub> ) Analyzer	One
4.	Continuous Ambient Ammonia (NH <sub>3</sub> ) Analyzer	One
5.	Continuous Ambient Ozone (O <sub>3</sub> ) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM <sub>10</sub> Particulate Matter Monitor	One
8.	Automatic PM <sub>2.5</sub> Particulate Matter Monitor	One
9.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
10.	Multi-calibration systems for Gas Calibration and Meteorological, Flow and Electronic Calibration	One Set
11.	Sensor-based instrument to measure Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on a telescoping crank- up Meteorological Tower.	One Set
12.	Computer system consisting of one PC along Colour Laser printer with the latest specification, and DAS at the monitoring station with peripherals. Software for data acquisition/ Data transfer and system integration, telephone, Modem.	One Lot
13.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analysers with Sampling line, Internal fitting, Instrument racks, Electrical and Gas line Fittings, Tools(electrical and mechanical).	One Unit
14.	Vehicle model number TATA 1616 LPT OR equivalent, along with vehicle frame (Chassis build up) air-conditioned and thermally stable instrument cabin.	One Unit
15.	Air Conditioner, Split Type, Roof Mounted, along with a voltage stabilizer (2 x 2 ton)	Two Unit
16.	6.5 KVA petrol generator (2 nos.)	One Unit

17.	Online UPS (1x5 KVA, 2 Hours backup)	One Unit
18.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analyzers with Sampling line, Internal fitting, Instrument racks, Electrical and Gas line Fittings, Tools (electrical and mechanical).	One Set
19.	<p><b>G.P.S. SYSTEM</b></p> <p>The van should have a GPS tracking facility and Wi-Fi facility so that its movement can be monitored from Head Office. Integrated GPS &amp; 3G modules for location tracking and wireless communication</p> <p>To operate with GPS / GSM / GPRS wireless network - GPS chipset with high sensitivity</p> <p>GPRS with sim card.</p> <p>Intelligent activation of GPS positioning</p> <p>To start working automatically after electrifying - Built-in ON / OFF power, wide voltage input range - Built-in monitoring CPU, eliminating breakdown automatically</p> <p>Commands and location information received by SMS</p> <p>Easy to install, open or hidden installment alternatives</p> <p>Two power input approaches: car-specific joint or car battery - Antenna: Built-in GSM, GPS antenna with low noise and high gain.</p>	As Specified
20.	<p><b>Seating arrangement:</b></p> <p>The basic van provided by the client shall be with company fitted driver seat +1 seat. An additional two seats, with Seat belts, shall be provided as under:</p> <p>All the seats shall be firmly fixed and secured properly. - Seats shall have a capacity to bear 400 kg of weight.</p> <p>All seat cushions shall be of good conditions with new soft upholstery.</p> <p>Prior approval for material quality and make shall be taken from engineer in charge.</p>	As Mentioned
21.	<p><b>Fresh Water Tank and Drain Water Tank and Wash basin</b></p> <p>Fresh water overhead storage Tank of about 50 liters (plastic) shall be fixed on the top of the roof of the van.</p> <p>The drain water tank (15 ltrs) shall be made of 3mm thick, food-grade plastic, to be mounted underneath the platform table. Total 2 such tanks shall be provided (One for the inlet water supply to the wash basin tap</p>	1+1 (W) total 2

	<p>and the Second for the collection of waste water from wash basin)</p> <p>The wastewater tank should be fitted with a controlled drainage facility to drain the wastewater as and when required.</p> <p>Both the Tank shall be easily removable for any sort of Maintenance and cleaning purposes</p> <p>Wash Basin: Stainless Steel (SS) wash basin with SS water tap for supplying water.</p> <p>A separate 0.5 HP pump (to be operated on external electricity) to fill up the overhead water tank shall be provided and fixed at the appropriate place, near the washbasin. Prior approval for material quality and make shall be taken from the engineer in charge</p>	
<b>22.</b>	<p>Fire extinguisher mounting: A proper heavy-duty bracket support (powder-coated on MS structure) should be provided beside storage 1 for placing a fire extinguisher. 1 No. of 2 Kg capacity in the driver cabin and 1 no of 6 Kg in the laboratory area.</p>	2 Units
<b>23.</b>	<p>First aid kit: Cotton rolls, Iodine, Scissors, Boric acid powder, Band aid strips. All other accessories and medical facilities.</p>	One Unit

## ATTACHMENT 2

## Station Protocol for MCAAQMV under O&amp;M Contract

Name of MCAAQMV

DATE:

S. No.	Parameter	Status	Zero Value		Zero Offset		Span Calibration			K Factor (Span)		Rem.
			Pre	Post	Pre	Post	Span Source	Pre	Post	Pre	Post	
1.	CO Analyzer											
2.	SO <sub>2</sub> Analyzer											
3.	NO <sub>x</sub> Analyzer/ NO											
	NO <sub>2</sub>											
	NO <sub>x</sub>											
	NH <sub>3</sub> Analyser											
4.	O <sub>3</sub> Analyzer											
5.	BTX Analyzer											
	Benzene											
	Toluene											
	E-benzene											
	M+P Xylene											
	O-Xylene											
6.	Dust Analyzer											
	PM <sub>2.5</sub>											
	PM <sub>10</sub>											
7.	<b>Meteorological Parameter</b>											
	Temperature											
	Humidity											
	Wind Speed											
	Wind Direction											
	Solar Radiation											
	Rain Fall											
8.	<b>Computers</b>	Make/Model:			Status:							
9.	<b>UPS / ACs / Others</b>	Make/Model:			Status:							
10.	<b>Data Display Board</b>	Make/Model:			Status:							
	<b>Maintenance Details</b>	1.										

	<b>Requirement</b> /	2.
	<b>Specific Obs.</b>	

**Station Maintained By.....Station supervised by .....**

**ATTACHMENT 3**

**DAILY REPORTING FORMAT FOR METREOLOGICAL PARAMETERS**

(To be submitted daily at 12 Noon for the previous day ending 12 midnight)

Location:

Date:

<b>HOURS</b>	<b>WIND SPEED</b>	<b>WIND DIRECTION</b>	<b>HUMIDI TY</b>	<b>TEMPER ATURE</b>	<b>SOLAR RADIATION</b>	<b>RAINF ALL</b>	<b>REMARK S</b>
00-01							
01-02							
02-03							
03-04							
04-05							
05-06							
06-07							
07-08							
08-09							
09-10							
10-11							
11-12							
12-13							
13-14							
14-15							
15-16							
16-17							
17-18							
18-19							
19-20							
20-21							
21-22							
22-23							
23-24							
Min.							
Max.							
Average							



**ATTACHMENT 5**

**DAILY REPORTING FORMAT FOR MAIL POLLUTANTS**

(TO BE SUBMITTED DAILY AT 12 NOON FOR THE PREVIOUS DAY ENDING 12 MIDNIGHT)

**DAILY AMBIENT AIR QUALITY DATA**

Location:

Date:

Hrs.	SO <sub>2</sub>	NO	NO <sub>2</sub>	NO <sub>x</sub>	NH <sub>3</sub>	CO	O <sub>3</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	Benzene	Toluene	Xylene	Remarks
00-01													
01-02													
02-03													
03-04													
04-05													
05-06													
06-07													
07-08													
08-09													
09-10													
10-11													
11-12													
12-13													
13-14													
14-15													
15-16													
16-17													
17-18													
18-19													
19-20													
20-21													
21-22													
22-23													
23-24													
Standards													
Min.													
Max.													
Average													

**ATTACHMENT 6**

**MONTHLY REPORTING FORMAT FOR MAIL POLLUTANTS**

(TO BE SUBMITTED DAILY AT 12 NOON FOR THE PREVIOUS DAY ENDING 12 MIDNIGHT)

**MONTHLY AMBIENT AIR QUALITY DATA**

**Location:**

**Date:**

Date	SO2	NO	NO2	NOX	NH3	CO	O3	P M 2.5	P M 10	Ben zene	Tol u ene	Xylene	Re m ark s
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
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22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
Min.													
Max.													
Average													



**VOLUME 1**  
**SECTION III**  
**FORM OF TECHNO-COMMERCIAL BID**

## SECTION III

### FORM OF TECHNO-COMMERCIAL BID

<b>SI No.</b>	<b>CONTENTS</b>	<b>Page No</b>
Attachment 1	Form of Questionnaire	52
Attachment 2	Certificate of O&M Partner of the Bidder in India	53
Attachment 3	Form of Letter of Authority	54-55
Attachment 3A	Form of Certificate of Supply of Spares and Consumables by Manufacture	56
Attachment 4	Form of Certificate of Country of Origin	57
Attachment 5	Form of Certificate of Carrying out O&M of MCAAQMV By the O&M Partner in India	58
Attachment 6	Form of Equipment List	58
Attachment 7	Form of Manufacturers List	59
Attachment 8 A	Proforma for Financial Capability for Bidder	60
Attachment 8 B	Proforma for Performance Statement for Manufacturer	61
Attachment 8 C	Proforma for Performance Statement for Authorized Representative of the Manufacturer	63
Attachment 9	Capability & Experience of O&M Partner	64
Attachment 10	Form of Bank Guarantee for Bid Security	65-66
Attachment 11	Form for Pre-requisites for Installation of equipment	67
Attachment 12	Deviation Schedule	68
Attachment 13	Indemnity Bond for Handing Over Air Monitoring Stations Including All Equipment to the O&M Contractor	69-70
Attachment 14	Scheduled Commercial banks (Bid Security)	71-72
Attachment 15	Scheduled Commercial Banks (Performance Security)	73-74
Attachment 16	Pre-Contract Integrity Pact	75-79

**ATTACHMENT 1**

**<Letterhead of the Bidder>**

**FORM OF QUESTIONNAIRE**

**Date:**

**To,  
The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004**

**From:**

**Name of Bidder  
Address  
Name of Representative  
Position  
Email. Id.  
Signature**

Questionnaire Format		
Tender page No	Tender Clause	Question

## Attachment 2

<Letterhead of the Bidder>

### CERTIFICATE OF O&M PARTNER OF THE BIDDER IN INDIA

To,  
The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004

**Subject:-Certificate of Existence of Local Branch, Sales Residential and Representative Office(s) in India**

1. Name of Office (s) :
2. Address :
  - Tel. No. :
  - Fax No. :
  - Telex No. :
  - Email id :
3. Status of Office(s) :
4. Date of Establishment of Office (s):
5. Name & Address of Residential Representative:
6. Total No. of years of association with OEM (Name of the manufacturer):
7. Total Manpower:
8. Total No. of trained Service Engineer:
9. Present number of offices in India (Name the locations & address):
10. Total Turnover in last 3 years:
11. Major jobs in Hand:
12. Experience in O&M contract:

Sl. No.	Name of Client and Address, Phone No. etc.	Description of Contract (Brief scope of contract)	Year of Placement of Order	Present Status

Signature:

Name:

Designation:

Seal:

**ATTACHMENT 3**

<Letterhead of the Manufacture>

**FORM OF LETTER OF AUTHORITY**

**To,  
The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004**

**Name of Manufacture**

**Subject: Letter of Authority from Manufacture**

**Ref. No.**

**Date:**

Dear Sirs,

We, (Name of Manufacturer), a manufacturer duly organized and existing under the law of (Country Name) with its principal office of business as (Address) hereby make, constitute and appoint (name of Bidder), a company duly organized and existing under the laws of (Country Name) with its principal office of business at (Address) to be our true and lawful attorney in fact to do the following sets and deeds:

To present and bind us in the for Supply and O&M of Mobile Continuous Ambient Air Quality Monitoring Van (MCAAQMV) for ..... at in the State of Jharkhand, India, regarding the supply and installation of the following equipment proposed in the bid which we manufacture or produce.

Item No.	Name of Equipment

We, as a manufacturer bind ourselves as co-worker of the bid and are jointly and severally responsible for the compliance of the said bid and once (Name of Bidder) has been selected as a successful bidder, we shall manufacture, delivery and install the equipment in accordance with the terms and conditions of contract with (Name of Bidder) and the.....Authority.

We hereby give and grant to the said (Name of Bidder) full power and authority to do and perform all and every act and thing whatsoever, requisite necessary and proper to be done in the premises, as fully, to all intents and purposes as we might or could do with full power of submission and renovation hereby ratifying and conforming all that (Name of Bidder) or its duly authorized representative shall lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, we have hereto signed this document on -----2025.

ACCEPTED ON....., 202

NAME OF BIDDER

.....

Name of duly authorized representative to sign and signature

.....

(Rank of position and Department)

NAME OF ISSUING MANUFACTURER

.....

Name of duly authorized representative to sign and signature

.....

(Rank of position and Department)

**ATTACHMENT 3A**

**< Letter Head of Manufacture >**

**FORM OF CERTIFICATE OF SUPPLY OF SPARES AND CONSUMABLES BY  
MANUFACTURER**

**To,  
The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004**

**Name of Manufacture**

**Subject: Certificate of Supply of Consumables and Spare Parts by Manufacturer**

This is to certify that we (Name of Manufacturer) shall supply the consumables and spare parts of the equipment mentioned below during O&M period under the contract (contract detail) to the contractor (Name of the contractor)/ Owner.

It is hereby guaranteed that we shall maintain stocks of consumables and spare parts for the following equipment for a period of Eight (8) years after the commissioning of the equipment in India.

Signature:

Name of Person:

Designation:

Name of Manufacturer:

Office Seal of:

Manufacturer:

Legal Address of Manufacturer:

**ATTACHMENT 4**

**< Letter Head of Manufacture >**

**FORM OF CERTIFICATE OF COUNTRY OF ORIGIN**

**To,  
The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004**

**Name of Manufacture**

**Subject:- Certificate of Country of Origin**

We, (Name of Manufacturer), hereby certify that our equipment for procurement and installation of equipment for..... in the State of Jharkhand, India is to be manufactured in the country mentioned below:

Item No.	Name of Equipment/ Instrument	Country of Origin

Signature:

Name of Person:

Designation:

Name of Manufacturer:

Legal Address of Manufacturer:

**ATTACHMENT 5**

**< Letter Head of O&M Partner >**

**FORM OF CERTIFICATE OF CARRYING OUT O&M OF MCAAQMV's BY THE O&M PARTNER IN INDIA**

**To,  
The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004**

**Sub:- Certificate of carrying out O&M of CAAQMS's by the O&M partner in India.**

This is to certify that we <Name of O&M Partner> hereby agree to carry out day to day Operation and maintenance of the CAAQMS to be installed and commissioned by <Name of the main bidder> for minimum of five years from the date of installation & commissioning of the CAAQMS at the rates quoted by <Name of the main bidder> against this tender, strictly in accordance with terms & conditions contained in this bid document.

Signature:

Name of Person:

Position:

Name of O&M Partner:

Name Seal of O&M Partner:

Legal Address of O&M Partner in India:

Counter-signed by main bidder:

Name of Person:

Position:

Name of the Bidder:

Office Seal of Bidder:

Legal Address of Bidder:

**ATTACHMENT 6**

**< Letter Head of O&M Partner >**

LIST of Equipment Imported and indigenous

<b>S. No.</b>	<b>Name of equipment</b>	<b>Quantity</b>	<b>Country of Origin</b>

Signature:

Name:

Designation:

Seal:

Date:

**ATTACHMENT 7**

**< Letter Head of O&M Partner >**

LIST of Manufacturer Imported and indigenous

<b>Sl. No.</b>	<b>Name of equipment</b>	<b>Name of manufacturer</b>

Signature:

Name:

Designation:

Seal:

Date:

**ATTACHMENT 8 A**

**< Letter Head of Bidder >**

PROFORMA FOR FINANCIAL CAPABILITY OF BIDDER (for a period of last three years)

Name of Bidder.....

<b>Year</b>	<b>Currency</b>	<b>Turnover</b>
<b>2022-2023 financial year</b>		
<b>2023-2024 financial year</b>		
<b>2024-2025 financial year</b>		
<b>Average</b>		

Note:

1. The annual turnover is to be supported by annual report.

Signature of Authorized representative.:

Name:

Designation:

Seal:

Date:

**ATTACHMENT 8 B**

**< Letter Head of Bidder >**

PROFORMA FOR PERFORMANCE STATEMENT FOR MANUFACTURER (for a period of last five years)

<b>Order placed by (full address of Purchaser)</b>	<b>Order No. &amp; Date</b>	<b>Description of ordered equipment (CAAQMS) (Model no.)</b>	<b>Quantity supplied</b>	<b>Value of order</b>	<b>Date of commissioning and handing over</b>	<b>Has the equipment been satisfactory functioning? (Attach certificates from the Purchaser/Consignee as per Clause 2.5.5 Section-I of ITB)</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

Signature of Authorized representative.:

Name:

Designation:

Seal:

Date:

**ATTACHMENT 8 C**

**< Letter Head of Bidder >**

**PROFORMA FOR PERFORMANCE STATEMENT FOR BIDDER (O&M OPERATOR) AS AUTHORIZED REPRESENTATIVE OF THE MANUFACTURER (for a period of last five years)**

<b>Order placed by (full address of Purchaser)</b>	<b>Order No.&amp; Date</b>	<b>Description of ordered equipment (CAAQMS) (Model no.)</b>	<b>Quantity supplied</b>	<b>Value of order</b>	<b>Date of commissioning and handing over</b>	<b>Has the equipment been satisfactory functioning? (Attach certificates from the Purchaser/ Consignee as per Clause 2.5.5 Section- I of ITB)</b>
1	2	3	4	5	6	7

Signature of Authorized representative.:

Name:

Designation:

Seal:

Date:

**ATTACHMENT 9**

**< Letter Head of O&M Operator/ Partner>**

**CAPABILITY & EXPERIENCE OF O&M PARTNER**

Name and address of the O & M Partner in India (if applicable):

<b>Sl. No.</b>	<b>Name of the O&amp;M personnel proposed to be deployed</b>	<b>Educational Qualification</b>	<b>Experience in no. of years in carrying out O&amp;M of MCAAQMV.</b>	<b>Detail curriculum Vitae Attached (YES / NO)</b>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				

Signature of the O&M Partner.:

Name of the Partner:

Designation:

Seal:

Date:

**ATTACHMENT 10**

**FORM OF BANK GUARANTEE FOR BID SECURITY**

(To be stamped in accordance with Stamp Act, if any, of the Country of the issuing Bank)

Bank Guarantee No.-----

Ref. No.:-

Date :-----

To,

The Member Secretary,  
Jharkhand State Pollution Control Board

.....  
Dear Sir,

WHEREAS----- ( hereinafter called “the Bidder”) has submitted its bid dated --  
----- for Supply and O&M of Continuous Ambient Air Quality Monitoring  
Stations(CAAQMS) for ..... at (hereinafter called “The Bid”)

KNOW ALL MEN by these present that WE----- of having our  
registered office at ----- (hereinafter called “The Bank”) are bound unto  
..... Jharkhand, India (hereinafter called “The Authority”) in the  
sum of ----- (amount as per bid document in Indian Rs. Or US \$, both in  
words and figures), for which payment well and assign, by these presents. Sealed with the  
common seal of the bank this-  
.....day.....of 2025.

THE CONDITIONS of this obligation are:

1. If a Bidder withdraws/modifies its Bid during the period of Bid validity specified in Sub-clause 4.6 hereunder;

Or

2. If the bidder having been notified of the acceptance of its bids by the JSPCB during the period of bid validity:
  - a. fails or refuses to execute the Contract Form, when requested; or
  - b. fails or refuses to furnish the Performance Security, in accordance with the Instruction to Bidders.

Or

3. In case bidder refuses to withdraw, without any cost to the Owner, those deviations, which the bidder did not state in the Deviation Schedules.
4. We undertake to pay to the JSPCB up to the above amount, according to, and upon receipt of, its first written demand, without the JSPCB having to substantiate its demand, provide that in its demand the JSPCB will note that the amount claimed by it is due to it owing to the occurrence of one or all of the three above stated conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up-to one (1) year after commissioning of entire system.

[ NAME OF THE BANK]

By.....

(Title)

**Authorized Representative**

---

**(Signature of Witness)**

**Name of Witness.....**

**Address of Witness.....**

---

**ATTACHMENT 11**

**< Letter Head of Bidder >**

**PRE-REQUISITES FOR INSTALLATION OF EQUIPMENT**

**To,**

**The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004**

Dear Sir

Following are the pre-requisites for installations of the equipment offered by us, which are required to be provided by you, prior installation of the equipment:

<b>Package no. Item No.</b>	<b>Name of the Equipment</b>	<b>Installation &amp; commissioning pre- requisites*</b>

Signature of Authorized representative.:

Name:

Designation:

Seal:

Date:

**ATTACHMENT 12**

**< Letter Head of Bidder >**

SUPPLY, INSTALLATION AND COMMISSIONING AND OPERATION & MAINTENANCE SERVICES OF MOBILE CONTINUOUS AMBIENT AIR QUALITY MONITORING VAN (MCAAQMV) AT -----FOR JSPCB

**(Deviation Schedule)**

To,

**The Member Secretary  
Jharkhand State Pollution Control Board  
Dhurwa, Ranchi-834004**

**Dear Sir,**

**Subject: Deviation Schedule.**

We declare that the following are the only and exhaustive deviations, variations from, exceptions and exclusions to the Bidding Documents for Services as outlined in your Technical Specifications for the subject package. Except for these deviations, subject to the approval and acceptance by you, the entire work shall be performed as per your specifications and documents. Further, we agree the additional conditions, if any found elsewhere in the offer other than those stated below, save that pertaining to any rebates/discount offered, shall not be given effect to.

<b>Equipment Code</b>	<b>Vol./Clause Ref./ Page No.</b>	<b>As Specified in the Bid Documents</b>	<b>Deviation and Variations to the Bid document</b>

\

**(Signature)**

**Place:**

.....

**(Printed Name)**

.....

**(Designation)**

.....

**(Common Seal)**

## ATTACHMENT 13

### **INDEMNITY BOND FOR HANDING OVER MOBILE CONTINUOUS AMBIENT AIR QUALITY MONITORING VANS INCLUDING ALL EQUIPMENT TO THE O&M CONTRACTOR**

This Indemnity Bond is made this ..... Day of 2025..... By... ..... a Company registered under the Companies Act, 1956/Partnership firm / Proprietary concern having its registered office at .....(hereinafter called as “Contractor” or “obligator” which expression shall include its successors and permitted assigns) in favour of JHARKHAND STATE POLLUTION CONTROL BOARD with Office at Ranchi, which term shall include permitted assigns and successors, (hereinafter called “MPCB” which expression shall include its successors and assigns).

Whereas JSPCB has awarded to the Contractor, a contract for O&M of the one no. Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) located at – -----, vide its Letter of Intent ...../Award Letter /Contract No..... dated ..... (hereinafter called the “Contract”), in the terms of which Contractor shall be responsible for the Equipments to be handed over to it by MPCB for the purpose of performance of the Contract (hereinafter called the “Equipments”).

Now, therefore this Indemnity Bond witnessed as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at Rs.----- - (Rupees.....) to be handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep MPCB indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment's as per details in the Schedule appended hereto.
2. That the Contractor is obliged and shall remain absolutely responsible for the safe custody of the Equipments at Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) belonging to MPCB against all risks whatsoever till the Equipments are duly used in accordance with all terms of the Contract. The Contractor undertakes to keep MPCB harmless against any loss or damage that may be caused to the Equipment.
3. The Contractor undertakes that the Equipments shall be used exclusively for the performance/ execution of the Contract strictly in accordance with its terms and conditions and no part of the Equipments shall be utilized for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a breach of trust on the part of the Contractor for all intents and purposes including legal / penal consequences.
4. That JSPCB is and shall remain the exclusive Owner of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever.
5. The Equipments shall at all times be open to inspection and checking by Project-in-Charge JSPCB shall always be free at all time to take possession of the Equipments in whatever form the equipments may be. If in its opinion, the equipments are likely to be endangered, mis utilised or converted to uses other than those specified in the Contract, by any act of omission or commission on the part of the Contractor; he finds itself and undertakes to comply with the direction or demand of JSPCB to return the Equipments without any demur or reservation.
6. Now the condition of this Bond is that if the Contractor shall duly and punctually complies with the terms and conditions of this bond to the satisfaction of JSPCB, then the above bond shall be void, but otherwise, it shall remain in full force and virtue.

In witness whereof, the Contractor has hereunto set its hand through its authorized representative under the common seal of the company, the day month and year first above mentioned.

**SCHEDULE NO. 1**

<b>Particulars of the Equipments handed over</b>	<b>Quantity</b>	<b>Value of the Equipment</b>	<b>Signature of Authorized Person</b>

**For and on behalf of M/s.....**

**Witness I**

- 1. Signature**
- 2. Name**
- 3. Address**

**Name**

**Signature**

**Designation**

**Authorized representative**

**Witness II**

- 1. Signature**
- 2. Name**
- 3. Address**

**Name**

**Signature**

**Designation**

**Authorized representative**

## ATTACHMENT 14

### LIST OF BANKS ACCEPTABLE FOR SUBMISSION OF BANK GUARANTEE FOR BID SECURITY

#### **(A) SBI AND ASSOCIATES**

1. State Bank of India
2. State Bank of Bikaner and Jaipur
3. State Bank of Hyderabad
4. State Bank of Indore
5. State Bank of Mysore
6. State Bank of Patiala
7. State Bank of Saurashtra
8. State Bank of Travancore

#### **(B) NATIONALISED BANKS**

1. Allahabad Bank
2. Andhra Bank
3. Bank of India
4. Bank of Maharashtra
5. Canara Bank
6. Central Bank of India
7. Corporation Bank
8. Dena Bank
9. Indian Bank
10. Indian Overseas Bank
11. Oriental Bank of Commerce
12. Punjab National Bank
13. Syndicate Bank
14. Union Bank of India
15. United Bank of India
16. UCO Bank
17. Vijaya Bank
18. Bank of Baroda

#### **(C) SCHEDULED PRIVATE BANKS (INDIAN BANKS)**

1. Bank of Rajasthan
2. Bharat Overseas Bank Ltd.
3. Catholic Syrian Bank
4. City Union Bank
5. Dhanalakshmi Bank
6. Federal Bank Ltd.
7. Jammu & Kashmir Bank Ltd.
8. Karnataka Bank Ltd.
9. Karur Vysya Bank Ltd.
10. Lakshmi Vilas Bank Ltd.
11. Lord Krishna Bank Ltd.
12. Nainital Bank Ltd.
13. Kotak Mahindra Bank
14. Ratnakar Bank Ltd.
15. Sangli Bank Ltd.

16. South Indian Bank Ltd.
17. Tamilnadu Mercantile Bank Ltd.
18. United Western Bank Ltd.
19. ING Vysya Bank Ltd.
20. Axis Bank Ltd.
21. S.B.I. Commercial & International Bank Ltd.
22. Ganesh Bank of Kurundwad Ltd.
23. INDUSIND Bank Ltd.
24. ICICI Bank Ltd.
25. HDFC Bank Ltd.
26. Centurion Bank of Punjab Limited
27. Development Credit Bank Ltd.
28. Yes Bank

**(D) SCHEDULED PRIVATE BANKS (FOREIGN BANKS)**

1. Abu Dhabi Commercial Bank Ltd.
2. ABN Amro Bank Ltd.
3. American Express Bank Ltd.
4. Bank of America NA
5. Bank of Bahrain & Kuwait
6. Mashreq Bank
7. Bank of Nova Scotia
8. The Bank of Tokyo-Mitsubishi UFJ Limited.
9. Calyon Bank
10. BNP Paribas
11. Barclays Bank
12. Citi Bank
13. Deutsche Bank
14. The Hong Kong and Shanghai Banking Corporation Ltd.
15. Oman International Bank
16. Societe Generale
17. Sonali Bank
18. Standard Chartered Bank
19. J.P Morgan Chase Bank
20. State Bank of Mauritius
21. Development Bank of Singapore
22. Bank of Ceylon
23. Bank International Indonesia
24. Arab Bangladesh Bank
25. Cho Hung Bank
26. China Trust Bank
27. Mizuho Corporate Bank Ltd.
28. Krung Thai Bank
29. Antwerp Diamond Bank N.V. Belgium
30. ING Bank N.V.

**(E) PUBLIC SECTOR BANK**

1. IDBI Ltd.

## ATTACHMENT 15

### LIST OF BANKS ACCEPTABLE FOR SUBMISSION OF BANK GUARANTEES FOR ADVANCE PAYMENTS, PERFORMANCE SECURITIES AND SECURITIES FOR DEED OF JOINT UNDERTAKING

#### LIST OF BANKS

##### (A) SBI and Associates

1. State Bank of India
2. State Bank of Bikaner and Jaipur.
3. State Bank of Hyderabad
4. State Bank of Indore
5. State Bank of Mysore
6. State Bank of Patiala
7. State Bank of Saurashtra
8. State Bank of Travancore

##### (B) Nationalized Banks:

1. Allahabad Bank
2. Andhra Bank
3. Bank of India
4. Bank of Maharashtra
5. Canara Bank
6. Central Bank of India
7. Corporation Bank
8. Dena Bank
9. Indian Bank
10. Indian Overseas Bank
11. Oriental Bank of Commerce
12. Punjab National Bank
13. Syndicate Bank
14. Union Bank of India
15. United Bank of India
16. UCO Bank
17. Vijaya Bank
18. Bank of Baroda

##### (C) Foreign Banks

1. Bank of America NA
2. The Bank of Tokyo-Mitsubishi UFJ Limited.
3. BNP Paribas
4. Calyon Bank
5. Citi Bank N.A.
6. Deutsche Bank A. G.
7. The Hong Kong and Shanghai Banking Corporation Ltd.
8. Standard Chartered Bank
9. Societe Generale

10. Barclays Bank
11. ABN Amro
12. Bank N. V.
13. Bank of Nova Scotia
14. Development Bank of Singapore i.e. DBS, Singapore

**(D) SCHEDULED PRIVATE BANKS IN**

1. Vysya Bank Ltd.
2. ICICI Bank Ltd.
3. HDFC Bank Ltd.
4. Axis Bank Ltd.

**(E) Public Sector Banks**

1. IDBI Ltd.

**ATTACHMENT 16**

**PRE CONTRACT INTEGRITY PACT**

**General**

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on.....day of the month of 2025, between, ....., acting through Shri ....., Member Secretary, hereinafter called the “BUYER”, which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns of the First Part and M/s..... represented by Shri , Chief Executive Officer (hereinafter called the “BIDDER / SELLER” which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER SPCB work under the ageis of Department of ..... performing its functions as per the provisions of Water Act1974, Air Act ,1981 and EPA Act, 1986 and rules framed thereunder;

NOW, THEREFORE;

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract tobe entered into with a view to :-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impactof corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

**Commitments of the BUYER**

1. The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

The BUYER will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.

All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an inquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

### **Commitments of BIDDERS**

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-

The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government.

\* BIDDERS shall disclose the name and address of agents and representatives and Indian BIDDERS shall disclose their foreign principals or associates.

\* BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

\* The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract

and the details of services agreed upon for such payments.

The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier.

The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

If the BIDDER or any employee of the BIDDER or any person action on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filling of tender.

The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

#### 4. **Previous Transgression**

The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.

The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

#### 5. **Sanctions for Violations**

Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required: -

- (i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER (s) would continue.
- (ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.
- (iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

- (iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime lending Rate Of State Bank Of India. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.
- (v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.
- (vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money (s) due to the BIDDER.
- (vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.
- (viii) To recover all sums paid in violation of this Pact by BIDDER (s) to any middleman or agent or broker with a view to securing the contract.
- (ix) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

The BUYER will be entitled to take all or any of the actions mentioned at para 5.1 (i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor (s) appointed for the purposes of this Pact.

#### 6. **Fall Clause**

The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India, State Pollution Control Board or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

#### 7. **Independent Monitors**

The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).

The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department/ within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

**8. Facilitation of Investigation**

In case of any allegation of violation of any provisions of this Pact or payment of Commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

**9. Law and Place of Jurisdiction**

This Pact is subject to Indian Law. The place of performance and jurisdiction is these at/place of the BUYER.

**10. Other Legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

**11. Validity**

The validity of this Integrity Pact shall be from date of its signing and extend up- to 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract. Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

12. The parties hereby sign the Integrity Pact at .....on.....

BUYER	BIDDER
Member Secretary	CHIEF EXECUTIVE OFFICER

Witness

1.....  
2.....

Witness

1.....  
2.....

**VOLUME I**

**SECTION IV**

**FORM OF FINANCIAL BID**

## SECTION IV

### FORM OF FINANCIAL BID

#### CONENTS

<b>SI No.</b>	<b>PARTICULARS</b>	<b>Page No</b>
Attachment 1	Bid Form	82-83
Attachment 2	Summary of Bid Price	84
Attachment 3	Bid Price Breakup	85
Attachment 3A	Bid Price Breakup for O&M of CAAQMS's for Five Years	86
Attachment 3B	Bid Price Breakup For O&M Of Mobile Vehicle for Five Years	87

**ATTACHMENT 1**  
**<LETTER HEAD OF THE BIDDER>**

Date:

Grant no.:  
Bid No.

**BID FORM**

To,

**The Member Secretary,  
Jharkhand State Pollution Control Board,  
T.A. Division, HEC Complex,  
Dhurwa, Ranchi- 834004 (JH)**

Gentlemen:

1. Having examined the Bidding documents for procurement, installation & commissioning and Operation & Maintenance of MCAAQMV's at ----- (number(s)) locations, JSPCB (herein after referred to as "the Works"), including, but not limited to, the Instructions to Bidders, Scope of Works, General and Special Conditions of Contract, Technical Specifications, Schedules, Attachments, Amendment Nos. .... we, the undersigned, offer to execute and complete the whole of the works and remedy any defects therein, in conformity with the said Bidding Documents for the sum of International trading currency ..... (in figures.....) for the equipment including all other charges as mentioned in the document, supplied from Foreign Origin and Indian Rupees..... (INR.....) for the incidental costs incurred in India (if any) as may be ascertained in accordance with the Summary of Bid Price and Bid Price breakup attached herewith and made part of this bid.
2. We undertake, if our Bid is accepted, to complete and deliver the whole of the Works comprised in the Contract within the time specified in the contract, subject to the said conditions.
3. If our Bid is accepted, we will obtain the guarantee of a bank in a sum Equivalent to -----percent of the Contract Price for the due performance of the Contract, in the form prescribed by the Board.
4. We agree to abide by this Bid for a period of One hundred eighty (180) days from the final date of the submission of Bid fixed in sub-clause 7.2 of the Instruction of Bidders, and shall remain bidding upon us and may be accepted at any time before the expiration of that period.
5. Unless and until a formal Contract is prepared and executed, this Bid, to get herewith your written acceptance thereof, shall constitute a binding Contract between us.
6. We understand that you are not bound to accept the lowest of any bid you may receive, and that you will not defray any expense incurred by us in bidding.

Date this..... day of .....2025

Signature..... in the capacity of.....

Duly authorized to sign Bid for and on behalf of.....

(IN BLOCK CAPITAL).....

Address.....

Facsimile number.....

Telephone Number.....

Email id.....

WITNESS.....

Address .....

Occupation.....

## ATTACHMENT 2

### SUMMARY OF BID PRICE

DESCRIPTION	Total Value in Indian Rs. (excluding GST)
<b>SUPPLY</b>	
The FOR-destination price of the Equipment from Attachment – 3	Rs.
<b>O&amp;M CHARGES</b>	
Total O&M charges for five years as indicated in Attachment 3A	Rs.
<b>GRAND TOTAL CONTRACT PRICE (INR) (I + II)</b>	
<b>(Indian Rupees Only)</b>	

#### NOTE:

1. Contract price quoted for supply part shall be on for destination basis and shall include all cost e.g. custom duty, trNo additional charges will be paid by the owner / MS, JSPCB other than the ones specified in the scope of works.
2. Only GST shall be payable extra as per applicable rate by the owner/ MS, JSPCB.
3. Quoted cost of O&M of Mobile CAAQMS for each year should be at least 12% (excluding GST) of the cost of supply ( to make the O&M cost as 12% of the supply cost (for destination), keeping the total quoted cost as unchanged.

**ATTACHMENT 3**

**BID PRICE BREAKUP FOR EQUIPMENT (CIF) PRICE**

<b>Item / Analyzer Name</b>	<b>Manufacturer</b>	<b>Country of Origin</b>	<b>Model</b>	<b>Quantity in Nos. /Sets</b>	<b>Unit Price in Rs.</b>	<b>TOTAL Price in Rs.</b>
Automatic Ambient CO Analyzer						
Automatic Ambient SO <sub>2</sub> Analyzer						
Automatic Ambient NO, NO <sub>2</sub> , and NO <sub>x</sub> Analyzer						
Automatic Ambient NH <sub>3</sub> Analyzer						
Automatic Ambient O <sub>3</sub> Analyzer						
PM <sub>10</sub> Monitor						
PM <sub>2.5</sub> Monitor						
Ambient BTX Analyser						
Multi-calibration systems for Gas Calibration and Meteorological, Flow and Electronic Calibration						
Meteorological System comprising of sensors for (A) Wind Speed, (B) Wind Direction, (C) Ambient Temperature, (D) Relative Humidity, (E) Solar Radiation , (F) Rainfall, mounted on (G) Telescopic Crank-up Meteorological Tower						
Computer system consisting of one PC along Colour Laser printer with latest specification, and DAS at the monitoring station with peripherals. Software for data acquisition/ Data transfer and system integration, telephone, Modem.						
19" rack cabinet to accommodate all Analyzers & Systems						
Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analysers with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line Fittings, Tools(electrical and mechanical).						
Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin.						
Air Conditioner, Split Type, Roof Mounted along with voltage stabilizer (2 x 2 ton)						
6.5 KVA petrol generator (2 nos.)						
Online UPS (1x5 KVA, 2 Hours backup)						

**ATTACHMENT 3A**

**BID PRICE BREAKUP FOR O&M OF MCAAQMV (ANALYZER SYSTEMS) FOR FIVE YEARS**

<b>Sl. No.</b>	<b>Year of O&amp;M</b>	<b>Total Charges for the year in Rs.</b>
<b>1</b>	<b>1st year</b>	
<b>2</b>	<b>2nd year</b>	
<b>3</b>	<b>3rd year</b>	
<b>4</b>	<b>4th year</b>	
<b>5</b>	<b>5th year</b>	
<b>TOTAL</b>		

**NOTE: TAXES APPLICABLE SHOULD BE MENTIONED SEPARATLY.**

**ATTACHMENT 3B**

**BID PRICE BREAKUP FOR O&M OF MOBILE VEHICLE FOR FIVE YEARS**

<b>Sl. No.</b>	<b>Year of O&amp;M</b>	<b>O &amp; M Cost/Mobile Vehicle including Cost of Scheduled Operation and Maintenance of the vehicle and its chassis. and as per the This will be achieved through laid-out standards in the operating manual of the vehicle (in Rs)</b>		<b>Qty. of MCAAQMV</b>	<b>Total O &amp; M Charges for the year in Rs.</b>
<b>1.</b>	<b>1st year</b>				
<b>2.</b>	<b>2nd year</b>				
<b>3.</b>	<b>3rd year</b>				
<b>4.</b>	<b>4th year</b>				
<b>5.</b>	<b>5th year</b>				
<b>Total</b>					

**NOTE: TAXES APPLICABLE SHOULD BE MENTIONED SEPARATLY.**

**VOLUME I**

**SECTION V**

**GENERAL CONDITIONS OF CONTRACT**

**SECTION V**  
**GENERAL CONDITIONS OF CONTRACT**

<b>Sl. No.</b>	<b>PARTICULARS</b>	<b>Page No</b>
<b>1</b>	Definitions	90
<b>2</b>	Intent of Contract	91
<b>3</b>	Performance of Works	91
<b>4</b>	Use of Contract Documents and Information	91
<b>5</b>	Location	92
<b>6</b>	Language and Calendar	92
<b>7</b>	Site Condition	92
<b>8</b>	Country of Origin	92
<b>9</b>	Specification of Equipment	92
<b>10</b>	Code and Standard	92
<b>11</b>	Electrical Ratings	93
<b>12</b>	Name Plate	93
<b>13</b>	Packing & Marketing	93
<b>14</b>	Shipment	94
<b>15</b>	Protection and Safety	95
<b>16</b>	Work Schedule	95
<b>17</b>	Projection Formation	95
<b>18</b>	Warranty / O&M Contractor	95
<b>19</b>	Insurance	96
<b>20</b>	Installation	96
<b>21</b>	Inspection and Test	97
<b>22</b>	Training	99
<b>23</b>	Completion	99
<b>24</b>	Submission of Documents	100
<b>25</b>	Payment	100
<b>26</b>	Prices	100
<b>27</b>	Performance Security	100
<b>28</b>	Assignment	100
<b>29</b>	Subcontract	101
<b>30</b>	Delays in the Contractor's Performance	101
<b>31</b>	Liquidated Damages	101

<b>32</b>	Suspension of Work	101
<b>33</b>	Termination for Default	101
<b>34</b>	Force Majeure	102
<b>35</b>	Termination of Insolvency	102
<b>36</b>	Resolution of Disputes	102
<b>37</b>	Taxes and Duties	103
<b>38</b>	Injury and Damage	104
<b>39</b>	Royalty and Patents	105
<b>40</b>	Effectiveness	105
<b>41</b>	Laws and regulations	105
<b>42</b>	Notices	105-106

## **GENERAL CONDITIONS OF CONTRACT**

These conditions encompass all the Works to be executed and completed by the Contractor for the Project and as further defined herein.

### **1.0 DEFINITION**

Unless the context of the General and Special Conditions of Contract otherwise requires, the following terms wherever in the General and Special Conditions of Contract shall have the meaning defined hereunder.

Words imparting the singular shall also include the plural and vice versa where the context requires. Whether the words and phrases defined in this Clause are capitalized or not in the Contract shall not affect their meaning.

- 1.1 “The Project” or “The Works” means Supply, Installation, Commissioning and Providing O & M Service of MCAAQMV to be installed in the State of Jharkhand- 2 Nos. and their Operation & Maintenance at defined locations under the supervision and control of (Jharkhand State Pollution Control Board).
- 1.2 “The Contract” means the written agreement to be concluded between the Board and the Contractor and includes terms and conditions stipulated on the Bidding Documents and any other descriptions annexed thereto which form an integral part of the agreement to be provided by the Board.
- 1.3 “The Contract Price” means the price payable to the Contractor under the Contract for the full and proper performance of its contractual obligations for the Works.
- 1.4 “The Equipment” means all kind of materials, Machinery, Components, apparatus, articles and instruments for the Project to be provided by the Contractor to the, Board under the Contract.
- 1.5 “GCC” means the General Conditions of Contract contained in this Section.
- 1.6 “SCC” means the Special Conditions of Contract in Section VI of this Volume.
- 1.7 “S/W” means the Scope of Works in Section II of this Volume.

1.8 “The Contractor” means the firm SUPPLY the Equipment and-performing the Works in connection with the Project under the Contract and includes his personal representatives, successors and authorized assignees.

1.9 The “Manufacturers” means the firms, which produce the Equipment to be furnished by the Contractor under the Contract with the Board.

1.10 “The Specifications” means the specifications of the Works to be performed by the Contractor in conformity with those specified in both the Technical Specifications of Volume II and all other related documents in the Bidding Documents, and modifications thereof or additions thereto as may from time to time be made, and approved in writing by the Board in case of prior to the Contract and agreed upon by both the Board and the Contractor after the Contract.

1.11 “The Sites” means MCAAQMV’s to be installed as specified in Clause 1 of Scope of Works (Section - II).

## **2.0 INTENT OF CONTRACT**

2.1 The intent and spirit of the Contract is to provide all the details for the Works herein specified to be fully completed within the duration of the Contract. 2.2

2.2 It is hereby understood that the Contractor, in accepting the Contract, agrees to furnish any and everything necessary for such intent, notwithstanding any omission in the Contract.

All matters omitted from the Contract which may reasonably be inferred to be obviously necessary for the efficient and stable completion of the Works shall be deemed to be included in the Contract and the Contractor shall be held responsible for any errors or losses which the Contractor may make due to such omissions as above.

## **3.0 PERFORMANCE OF WORKS**

Unless otherwise provided for, the Works shall be performed by the Contractor in compliance with S/W, GCC, SCC and the Specifications in this Bidding Documents issued by the Board and Contract to be concluded between the Board and the Contractor. Unless otherwise agreed or stated, the Contractor shall bear all the cost and take all the responsibilities for the performance of all the Works.

## **4.0 USE OF CONTRACT DOCUMENTS AND INFORMATION**

4.1 The Contractor shall not, without the Board’s prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the Board and their authorized personnel and body in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

4.2 The Contractor shall not, without the Board’s prior written consent, make use of any documents or information enumerated here above except for purpose of performing the Contract.

4.3 Any documents other than the Contract itself, enumerated in here above shall remain the property

of the Board and shall be returned to the Board on completion of the Contractor's performance under the Contract if so required by the Board.

## **5.0 LOCATION**

As defined by the Board as per list attached at IFB.

## **6.0 LANGUAGE AND CALENDAR**

6.1 Language All documents and correspondence related to the Contract shall be made in English.

6.2 Calendar: All dates, months, years and terms referred in the Contract shall relate with the Indian Calendar, unless otherwise mentioned specifically.

## **7.0 SITE:**

The location sites of the MCAAQMV would be primarily at the Regional Offices and as per the list depicted on respective pages of this document.

## **8.0 COUNTRY OF ORIGIN**

8.1 All the Equipment supplied under the Contract shall have its origin in the eligible countries.

8.2 For the purposes of this Clause, "Origin" means the place where the Equipment was produced or manufactured. The Equipment is produced or manufactured when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics in purpose or utility from its components.

8.3 The origin of Equipment is distinct from the nationality of the Contractor.

## **9.0 SPECIFICATION OF EQUIPMENT**

9.1 Equipment The Contractor shall Supply all the Equipment specified in the package quoted as per the package-wise Equipment List of Attachment 1.

All the Equipment to be supplied under the Contract shall be new and unused.

### **9.2 Specification of Equipment**

The performance, materials, duty, workmanship, operating conditions, and design conditions for the Equipment shall meet and comply with the Tender Specifications.

The Specifications indicate the principal and minimum technical requirements for each equipment. The details of the Equipment shall be fully examined and suitably selected through the detailed engineering and design without sacrifice in quality of serviceability of the Equipment.

The figures of dimension and weight shown in the Specifications are indicatively presented as approximate figures. These figures may not necessarily and exactly be applied for the selection of the Equipment, but the Contractors shall meet the principal and minimum requirements shown in the Specifications. Any Bidder offering better specification than the minimum prescribed shall be considered as technically qualified.

## **10.0 CODE AND STANDARD**

### **10.1 Code and Standard**

All the Equipment and the Works shall conform to the approved and authorized codes and standards of the origin country, the following standards wherever applicable and Indian Standard which are in force at the moment of the installation.

- Japanese Industrial Standard (JIS)
- Environmental Protection Agency of United States (U.S EPA)
- Standard
- International Organization for Standard (ISO)
- British Standard (BS)
- TUV Germany
- MCERTS- SIRA certification U.K Environment Agency

Other internationally prevailing standards are accepted for the Equipment, unless otherwise indicated.

Even if some codes and standards are designated in the Specifications, the other codes and standards not shown therein are also applicable instead of the designated ones as far as they are equivalent to such designated codes and standards and meet the requirement thereof.

## **10.2 Metric System:**

All dimensions and performance of the Equipment shall be stated in metric system, unless otherwise specified in the Specifications.

## **11.0 ELECTRICAL RATINGS**

### **11.1 Electrical Rating**

**The Electrical Rating:** The Equipment shall conform to the following ratings and standards wherever applicable.

- 1) All the electrically operated equipment specified herein shall be single phase, 230 Volts  $\pm 10$  volts AC and 50 Hz  $\pm 3\%$  unless otherwise specified in the Specifications.
- 2) Electrical plugs for the Equipment shall conform to local regulations and standards.

### **11.2 Precautions against Voltage Fluctuation**

An adequate automatic voltage regulator for the Equipment shall be arranged by the Contractor wherever indicated in the Specifications. The Contractor shall pay due attention to the fact that electrical voltage fluctuation exerts a serious influence and damage upon the functioning of the equipment.

## **12.0 NAME PLATE**

Name plate shall be affixed on a suitable place of the Equipment in accordance with the provision of SCC.

## **13.0 PACKING AND MARKING**

### **13.1 Packing**

- 1) Transportation by air cargo: The Contractor shall pack and transport the Equipment in the double carton, approved by airline and deliver separately to the designated Site in complete condition.
- 2) Transportation by vessel: The Equipment shall be packed and transported for seaworthy shipment in such a manner that it is carried to the Sites in complete condition. The packages shall be made shockproof, waterproof, moisture-proof, and any other protection against rough handling, exposure to extreme temperature, salt, precipitation, open storage and other severe tropical conditions during transit to each final Site. This equipment shall be transported by container vessel and packed separately for the designated Site.

**13.2 Marking:** The outside of the package shall be marked in accordance with SCC in such a manner that they are clearly visible, protected against loss and resistant to external influences.

### **13.3 Packing List**

Contents of each package and/or the Equipment shall be itemized on a detailed list showing the exact weight, and extreme outside dimensions of length, width, and height of each package and/or the Equipment. One copy of the detailed packing list indicating the name of components, assembly number and quantity which corresponds to those of the Equipment in each package, shall be enclosed in each package.

Enclosed in one package, there shall also be a master packing list summarizing and identifying each individual package. The packing list shall be placed in a waterproof cover and secured against any external influence of the package.

### **13.4 SHIPMENT**

**13.4.1 Shipment:** Shipment of the equipment from foreign origin shall be made as specified in SCC.

**13.4.2 Shipping Documents:** Promptly after shipment of equipment of foreign origin, the Contractor shall airmail the shipping documents to the Board in accordance with SCC.

**13.4.3 Unloading and Custom Clearance:** The Contractor shall arrange the clearing agent for unloading, customs clearance and storage of the equipment from the Foreign Origin, documentation and all the other procedures. The Board will agree to assist the Contractor where required in obtaining clearance of the Equipment through the customs and provide exemption certificate, if required.

**13.4.4 Inland Transportation:** The Contractor shall be fully responsible for the delivery of all the Equipment to the Sites. The Contractor shall arrange at his option and cost for the transportation from the port of entry to each Site for the equipment of foreign origin. Transportation of Radioactive material if any, shall be carried out by the contractor, and the contractor will obtain statutory clearances for the same.

**13.4.5 Handling and Storage:** The Contractor shall protect the Equipment from any damage and avoid overloading. Particular attention shall be given to the perishable Equipment and

those which must be kept dry, cool or from exposure to direct sunshine and moisture. In case a part of the Board's facilities is necessary to be occupied by the Contractor for temporary storage or installation use, the Contractor shall obtain the written approval from the Board for temporary occupation and protect the facilities against any damage. Charges payable for this facility to the Board for this shall be fixed by the Board.

#### **14.0 PROJECTION AND SAFETY**

The Contractor shall be totally responsible for all the reasonable precautions against fire in respect of the Works, temporary works, offices, storage yards and other places and things connected therewith.

The Contractor shall comply with all rules, regulations and orders which have been made by the Government of India, the Board or any other competent authority and the Contractor shall provide sufficient fire-fighting protection in respect of the safety of the property and personnel of the Board.

#### **15.0 WORKS SCHEDULE**

The time schedule for the Works to be carried out by the Contractor is specified in SCC. The Contractor shall complete the Works in accordance with the Works schedule specified here above.

#### **16.0 PROJECT FORMATION**

**16.1 JSPC Board:** The authorized personnel from Jharkhand State Pollution Control Board for the Project who is responsible for any coordination with the Contractor. However, all correspondence to or authorization from the Board shall be made with the Member Secretary on following Address:

**The Member Secretary,  
Jharkhand State Pollution Control Board,  
TA Division, HEC Complex,  
Dhurwa, Ranchi – 834004 (JH)**

#### **17.0 WARRANTY / O & M CONTRACT**

**17.1** All the MCAAQMV's shall be under the O&M Contract from the date of successful commissioning of the MCAAQMV's. The detailed terms and conditions and scope of work during O&M Contract period shall be as specified in the Scope of Work, Section II of this document.

**17.2** However, the Contractor shall warrant to the Board that the Equipment to be supplied under the Contract is new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. This warranty includes all spare parts and services to keep the instruments and equipment in operating condition. In case O & M is not awarded/terminated the equipment shall remain warranted for 3 years.

**17.3** The Contractor shall further warrant to the Board that the Equipment complies strictly with the Specifications and has no defect, arising from design, materials, or workmanship or from any act

or omission of the Contractor that may develop under normal use of the supplied Equipment in the conditions prevailing to the final Sites.

**17.4 Period of O&M Contract:**

This O&M Contract shall remain operative for the period specified in SCC after the successful installation & commissioning of the Air Quality Monitoring System by the Contractor.

**17.5 In Case of Faulty Equipment :**

If any part of the Equipment breakdowns or fails due to faulty of improper design, materials, workmanship, manufacture, fabrications or instructions, or fails to meet the requirements of the Specifications, then the Contractor or his O&M partner shall promptly notify the manufacturer in writing of any claims arising under this clause. Contractor or his O&M partner shall ensure that within the period specified in Scope of Work for O&M Contract in Section II of the document and with all reasonable speed, the repair or replacement of the defective Equipment or improper parts thereof is carried out at the Contractor's expenses. In the event that any part of the Equipment becomes defective due to no fault of the Contractor, such as voltage fluctuations, misuse, and negligence, the Contractor will be indemnified by the Board in respect of repair thereof.

**17.6 Manufacturer's Warranty:**

The contractor must take into account any manufacturer's standard Warranty on the equipment supplied before quoting for O&M cost for the years for which such Warranty is applicable.

**18.0 INSURANCE**

The Equipment supplied under the Contract shall be fully insured (Comprehensive) in currency acceptable as per the existing Law of India against loss or damage incidental of manufacture or acquisition, transportation, storage, shipment, delivery, installation and training involved with the Works naming the Board as the beneficiary, in the manner specified in the SCC, until issuance of taking over certificate.

**19.0 INSTALLATION**

**19.1** All the Equipment shall be installed and brought into suitable conditions for operation by the Contractor at the Sites designated by the Board. The Contractor shall make all the necessary and proper adjustments and arrangements, including, but not restricted to, the utility supplies and connections, foundation and erection works specified in Clause 3 of S/W in order to install the Equipment in adequate conditions for operation. All matters omitted from this Clause which may reasonably be incurred to be obviously necessary for the proper installation and operation of the Equipment shall be deemed to be included in this installation works, and the Contractor shall be held responsible for any errors or defects which the Contractor may make due to such omissions thereof.

**19.2** Only the best installation practices are to be applied, and all the installation works must be done to the satisfaction of the Board and the Contractor shall carry out his works in a neat and proper workmanlike manner. The installation shall be planned and carried out in a way to damage

installation materials and the Equipment.

**19.3** All the equipment, tools, materials, labour, logistics, and all the other requirements for installation shall be provided by the Contractor.

**19.4** Prior to the establishment of the Equipment layout and installation plan, the Contractor shall verify, check and inspect the designs and specific site conditions of monitoring vans and laboratories where the Equipment is to be installed so as to make a good arrangement for installation and utility assembly in consultation with the Board.

## **20.0 INSPECTION AND TEST**

**20.1** The Board shall have the right to inspect and test the Equipment to confirm their conformity to the Specifications without any extra charge to the Board by the Contractor. The Contractor shall notify the Board, in a timely manner (at least 21 days in advance), of the schedule of inspections and test.

**20.2** The inspections and test shall be conducted on the premises of the Contractor and/or the Manufacturers and the Sites. If conducted on the premises of the Contractor and/or the Manufacturers, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the Inspection Team for the inspections and test at no charge to the Board.

**20.3** Should any inspected or tested Equipment fail to conform to the Specifications, the Board may reject the Equipment, and the Contractor shall either replace the rejected Equipment or make alternations necessary to meet the Specifications requirements free of cost to the Board.

**20.4** No pre dispatch inspection is envisaged for equipment of foreign origin and contractor shall furnish factory test / inspection reports as furnished below of the manufacturer along with the dispatch documents. However, the Board reserves the right to appoint at its cost, any inspection agency (other than suggested by contractors) which will be binding on the contractor.

→ Performance Test Certificate of all analyzer/ UPS/ 1.2 mm pre-coated GI Sheet of container, NIST traceability for gas Aluminum cylinders / Permeation tube.

→ Certificate of Traceability

→ Verification of System Completeness

→ Product Certificate

**20.5** For the equipment of Indian origin contractor should submit check list for equipment for approval of JSPCB. For container, contractor should take prior approval of the drawing from JSPCB. Contractor should notify date of pre-dispatch inspection to the JSPCB at least 15 (fifteen) days ahead of inspection.

The Board's right to inspect, test and, where necessary, reject the Equipment after the Equipment's arrival in India shall in no way be limited or waived by reason of the Equipment having previously

been inspected, tested and passed by the Board prior to the Equipment's shipment from the country of origin.

### **Inspections and Tests**

Manufacturer's test and inspection certificate to be provided along with the Supply Inspection and tests prior to shipment of Goods and at final acceptance are as follows:

- (i) Inspection: The Drawing of each of the equipment is to be certified by a qualified expert as may be nominated by the Member Secretary, Jharkhand State Pollution Control Board - Ranchi. The equipment shall be inspected if required at the manufacturer's place in India or its dispatch facility in India, prior to dispatch and also after successful installation at respective site by Officials / expert, nominated by the Member Secretary, Jharkhand State Pollution Control Board. Such authority shall issue the inspection and clearance certificate which will be a mandatory document for release of payments of 80 %.
- (ii) The inspection of the goods shall be carried out to check whether the instruments are in conformity with the technical specifications contained in the bid document and attached with the letter of acceptance and shall be in line with the inspection/test procedures laid down in the technical specifications and the, manufacturer's warranty certificate. The purchaser will test the equipment at the manufacturer's place before dispatch and also after completion of the installation and commissioning at the site of the installation. For site preparation, the supplier should furnish all details to the purchaser sufficiently in advance so as to get the works completed before receipt of the equipment. Complete hardware and software as specified in bid document should be supplied, installed and commissioned properly by the supplier prior to commencement of performance tests.
- (iii) The acceptance test will be conducted by a committee/Officials appointed by The Member Secretary, Jharkhand State Pollution Control Board, Ranchi will inspect and make recommendation on the acceptance of material.

At its option the committee can co-opt any other subject matter specialist to facilitate the inspection. The acceptance will involve trouble- free operation for seven consecutive days. There shall not be any additional charges for carrying out acceptance tests. No malfunction, partial or complete failure of any part of hardware or excessive heating of engines and sub-systems attached to instruments should occur. The supplier shall maintain necessary log in respect of the results of the tests to establish to the entire satisfaction of the purchaser, the successful completion of the test specified. An average uptake efficiency of 98% (to modify as considered appropriate for each case) for the duration of test period shall be considered as satisfactory.

- (iv) In the event of the hardware and software failing to pass the acceptance test, a period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, failing

which the purchaser reserves the rights to get the equipment replaced by the supplier at no extra cost to the purchaser.

### **Manuals and Drawings**

- (a) Before the goods and equipment are taken over by the Purchaser, the Supplier shall Supply, Operation and maintenance manuals together with drawings of the goods and equipment. These shall be in such detail as will enable the Purchaser to operate, maintain, adjust and repair all parts of the works as stated in the specifications.
- (b) The manuals and drawings shall be in the ruling language (English) and in such form and numbers as stated in the contract.
- (c) Unless and otherwise agreed, the goods and equipment shall not be considered to be completed for the purpose of taking over until such manuals and drawings have been supplied to the Purchaser.

### **For the System and Other Software, the following will apply:**

The Supplier shall provide complete and legal documentation of hardware and all subsystems so necessary for operation of the equipment's. The supplier shall also indemnify the purchaser against any levies/penalties on account of any default in this regard.

### **Acceptance Certificates:**

- (a) On successful completion of acceptability test, receipt of deliverables etc, and after the purchaser is satisfied with the working on the equipments, the acceptance certificate signed by the supplier and the members of committee/officials will be issued. The date on which such certificate is signed shall be deemed to be the date of successful commissioning of the systems.
- (b) The training as specified in Technical Specifications shall be conducted on the dates mutually agreed upon and within two months from the date of acceptance of Commissioning of MCAAQMV.

## **21.0 TRAINING**

21.1 The Contractor shall provide the Board staff with the training as specified in Clause 5 of S/W for the Equipment & Technical Specification.

21.2 The Contractor shall furnish the schedule and program of the training to the Board within 30 days after the notification of award in such a manner that proper training is imparted to Board staff members.

**22.0 COMPLETION:** The Contractor shall complete all the Works by the date as specified in SCC.

## **22.1 Taking Over**

Upon successful completion of delivery, installation, inspection and training of the Equipment to and at the designated Sites and O&M of the MCAAQMV for the period specified in S.C.C., the

Contractor shall notify the Board in writing that all the Works under the Contract have been completed at least 30 days before expiry of O&M Contract period. Immediately after completion of O&M Contract period as specified in S.C.C., the Board will take over the Mobile Continuous Ambient Air Quality Monitoring Vans or make alternate arrangement for their O&M.

### **23.0 SUBMISSION OF DOCUMENTS**

The Contractor shall submit the documents specified in SCC to the Board. The Contractor shall prepare all the documents in English. Besides the documents thereof, the Contractor shall submit the notices, reports, and other documents when deemed necessary, in accordance with the direction of the Board.

### **24.0 PAYMENT**

#### **24.1 Payment**

The method, terms and conditions of payment to be made to the Contractor under this Contract shall be specified in SCC. The Contractor's request(s) for payment for, as appropriate, the Equipment delivered and the Works performed and fulfillment of other obligations stipulated in the Contract shall be made to the Board in writing, accompanied by documents specified in SCC.

**24.2** The payment shall be made promptly by the Board but in no case not later than sixty (60) days after submission of invoice or claim by the contractor.

**24.3 Currency of Payment:** The currency in which payment is made to the Contractor under this Contract shall be specified in SCC.

### **25.0 PRICES**

Prices charged by the Contractor to the Board for the Equipment delivered and the Works performed under the Contract shall not vary from the prices quoted by the Contractor in the Financial Bid.

### **26.0 PERFORMANCE SECURITY**

#### **26.1 Performance Security**

The Contractor within thirty (30) days from the date of notification of award shall furnish a Bank Guarantee from a reputed Indian or Nationalized Commercial Bank having license to do business in India to the Board in line with the enclosed form as per Attachment 1 Section VI towards performance guarantee for an amount equal to ten (10 %) percent of the total Price under the Contract for faithful and due fulfillment by the Contractor of all obligations under the terms and conditions of the Contract. (Valid up to 1 Year from date of Successful installation and Commissioning) [Attachment -1, Section VI]. The Bank Guarantee from Indian Nationalized Bank for Operations and Maintenance Service shall furnish before signing the contract agreement by contractor for an amount equal to four (4) quarterly O & M Charges. (Valid for 5 Year O & M Service Period). [Attachment -4, Section VI] The Contractor shall ensure that Contract Performance Security remains valid at one year after commissioning of entire system satisfactorily.

## **26.2 Return of Performance Security**

**26.3** The performance security (guaranty) will be discharged by the Board and returned to the Contractor not later than forty-five (45) days after expiry of one year subject to date of completion of the Contractor's performance obligations under the Contract, including obligations, unless specified otherwise in SCC.

## **27.0 ASSIGNMENT**

The Contractor shall not assign in whole or in part, its obligations to perform under this Contract, except with the Board's prior written consent.

## **28.0 SUBCONTRACTORS**

**28.1** The Contractor shall notify the Board in writing of all the Manufacturers awarded under this Contract and any other subcontractors involved with performance of the Works if not already specified in the Bid. Such notification, in the original Bid or later, shall not relieve the Contractor from any liability or obligation under the Contract.

## **29.0 DELAYS IN THE CONTRACTOR'S PERFORMANCE**

**29.1** Delays in the Contractor's Performance Delivery of the Equipment and performance of the Works shall be made by the Contractor in accordance with the time schedule specified in SCC.

### **29.2 Notification of Delay**

If at any time during performance of the Contract, the Contractor and/or the Manufacturers should encounter conditions impeding timely delivery of the Equipment and performance of the Works, the Contractor shall promptly notify the Board in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Contractor's notice, the Board shall evaluate the situation and may at its discretion extend the Contractor's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the Board by amendment of the Contract.

### **29.3 Liability of Liquidated Damages**

Except as provided under Clause 34 of GCC, a delay by the Contractor in the performance of its delivery obligations shall render the Contractor liable to the imposition of liquidated damages pursuant to Clause 31 hereunder, unless an extension of time is agreed upon pursuant to Sub-clause 30.2 here above without the application of liquidated damages.

## **30.0 LIQUIDATED DAMAGES**

If the Contractor fails to perform the Works within the period specified in Clause 11 of SCC, the Board shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in SCC. Once the maximum is reached, the Board may consider termination of the Contract pursuant to Clause 35 of GCC.

## **31.0 SUSPENSION OF WORK**

The Contractor shall not suspend the whole or any part of the Works without notice to the Board

in writing. The Contractor thereupon shall do all possible endeavors to reduce any expenses or costs resulting from the suspension. Such suspension shall not nullify the Contract.

## **32.0 TERMINATION FOR DEFAULT**

### **32.1 Termination for Default**

The Board, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Contractor, may terminate this Contract in whole or in part:

- 1) If the Contractor fails to perform any or all of the Works within the period specified in Clause 11 of SCC, or extension thereof granted by the Board pursuant to Clause 32 of GCC or
- 2) If the Contractor fails to perform any other obligations under the Contract.

**32.2 Liability for Excess Cost for Unperformed Work** In the event the Board terminates the Contract in whole or in part pursuant to Sub-clause 33.1 here above the Board may procure at the risk and cost of the contractor, upon such terms and in such manner as it deems appropriate, the equipment / works similar to those undelivered / unperformed and the Contractor shall be liable to the Board for any excess costs for such similar equipment / works. However, the Contractor shall continue performance of the Contract to the extent not terminated.

## **33.0 FORCE MAJEURE**

**33.1** Notwithstanding the provisions of Clauses 32, 33 and 35 in GCC, the Contractor shall not liable for forfeiture of its performance security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

**33.2** For the purposes of this Clause, “Force Majeure” means an event beyond the control of the Contractor and not involving the Contractor’s fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the Board in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

**33.3** If a Force Majeure situation arises, the Contractor shall promptly notify the Board in writing of such condition and the cause thereof. Unless otherwise directed by the Board in writing, the Contractor shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

## **34.0 TERMINATION FOR INSOLVENCY**

The Board at any time terminates the Contract by giving written notice to the Contractor if the Contractor becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Contractor, provided that such, termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Board.

## **35.0 RESOLUTION OF DISPUTES**

### **35.1 Settlement of Disputes**

Any dispute(s) or difference(s) arising out of or in connection with the Contract shall, to the extent possible in the first instance be resolved amicably between the Contractor and the Owner's.

If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Contractor may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.

Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.

In the case of dispute or difference arising between the Purchaser and a Domestic Contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of (3) three arbitrators one each to be appointed by the Purchaser and the Contractor. The third arbitrator shall be chosen by the 2 (two) Arbitrators so appointed by the parties and shall act as Presiding arbitrator.

In case of failure of the two-arbitrator appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the President of the Institution of Engineers (India). In case of a dispute with a Foreign Contractor, the dispute shall be settled in accordance with provision of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules. The Arbitral Tribunal shall consist of three Arbitrators one each to be appointed by the Purchaser and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties, and shall act as presiding arbitrator.

In case failure of two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the President of the Institution of Engineers (India).

If one of the parties fails to appoint its arbitrator in pursuance of SubClause (a) and (b) above, within thirty days after receipt of the notice of the appointment of its arbitrator by the other party, then the Presiding Arbitrator shall be nominated by President of the Institution of Engineers (India), both in case of the foreign contractor as well as Indian Contractor, shall appoint the arbitrator. A certified copy of the order of the President of the Institution of Engineers (India), making such an appointment shall be furnished to each of the parties.

Arbitration proceedings shall be held at Ranchi, Jharkhand India, and the language of the arbitration proceedings and that of documents and communications between the parties shall be English. The decision of the majority of arbitrators shall be final and binding upon both parties.

The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself. Where the value of the contract is Rs. 10 million and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority namely the President of the Institution of Engineers (India).

### **36.0 TAXES AND DUTIES**

- a) Presently, Concessional Customs Duty (CCD) shall be applicable on the equipment being imported by Jharkhand State Pollution Control Board. Necessary exemption certificate shall be issued by JSPCB and applicable Custom Duty after claiming concession, if any such Custom Duty shall be paid/reimbursed by JSPCB at actuals.
- b) JSPCB is also exempted from paying Excise Duty. Necessary exemption certificate shall be issued by the JSPCB.
- c) Local taxes or any other taxes applicable will be paid/reimbursed to the supplier by JSPCB at actual against documentary evidences.
- d) Taxes on incidental services like Installation, Commissioning and training and O&M service etc. shall be payable extra at actuals by JSPCB.

### **37.0 INJURY AND DAMAGE**

#### **37.1 Injury or Death of Persons**

The Contractor shall be liable for and shall indemnify the Board against any liability, loss claim or proceedings whatsoever arising under any statute or law in respect of personal injury or death or any disability caused by the carrying out of the Works unless due to any act or neglect of the Board, or of any person for whom the Board is not responsible.

Without prejudice to the Contractor's liability to indemnify the Board, the Contractor shall maintain and cause any manufacturers and subcontractors to maintain such insurance as necessary to cover the liability of the Contractor or, as the case may be, of such Manufacturers and subcontractors, in respect of personal injuries of deaths arising out of or in the course of or caused by the carrying out of the Works.

#### **37.2 Damage to Property**

The Contractor shall liable for and indemnify the Board against and insure and cause any Manufacturers and subcontractors to insure against any expense, liability, loss claim or

proceedings in respect of any damage whatsoever to any real or personal property for any one occurrence in so far as such damage arises out of or in the course of or by reason of the carrying out of the Works and is due to any negligence, omission or default of the Contractor or any person for whom the Contractor is responsible or any Manufacturers and subcontractors or person for whom the Manufacturers and subcontractors are responsible.

### **38.0 ROYALTY AND PATENTS**

38.1 The Contractor shall pay all royalties and licenses fees for the use of any patented item, whether it may be an invention, method, arrangement, article, process or appliance used in connection with the performance of the Contract. The Contractor shall indemnify and save harmless the Board against any and all costs, damages and expenses of any nature or kind whatsoever which may arise out of or result from a claim by any person, firm or corporation that the manufacture, purchase, use of sale of any of the inventions, methods, arrangements, articles processes or appliances used in connection with the performance of this Contract infringes any patent of such other rights. The Contractor shall, at the request of the Board, defend the Board against any suit brought to enforce any such claim at the Contractors expense.

38.2 In case any such patented item used on or in conjunction with the Works is in suit held to constitute and infringement of its use enjoined, the Contractor shall either secure for the Board the right to continue using the said item by suspension of the enjoinder, by procuring for the Board a license or otherwise, or will replace such items with a non-infringing item or modify it so that it becomes non-infringing or with the Board's approval remove the said enjoined item and refund to the Board the sums paid thereof.

### **39.0 EFFECTIVENESS**

This Contract shall come into force and effect on the date of the Letter of Award and shall be in force until the Works have been completed and all the payments have been made to the Contractor, including the payments for O & M contract period.

### **40.0 LAWS AND REGULATIONS**

The formation, validity and performance of this Contract shall be governed as to all matters by and under the laws and regulations of India and courts in Ranchi, Jharkhand shall have exclusive jurisdiction in all matters arising under this Contract.

The Contractor shall respect and abide by all laws and regulations of India and shall make its best effort to ensure that the personnel of the Contractor and their dependents, while staying in India, shall respect and abide by all laws and regulations of India. The Contractor shall protect, absolve and indemnify the Board and their representatives from any claim, loss or damage arising from any non-compliance alleged or proved, without claiming them for payment.

### **41.0 NOTICES**

Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by cable, telex, facsimile and confirmed in writing to the other party's address

specified in SCC.

A notice shall be effective when delivered or on the notice's effective date, whichever is later.

**VOLUME I**

**SECTION VI**

**SPECIAL CONDITIONS OF CONTRACT**

## SECTION VI

### SPECIAL CONDITIONS OF CONTRACT

<b>SI No.</b>	<b>PARTICULARS</b>	<b>Page No</b>
<b>1</b>	Climate Condition	109
<b>2</b>	Consumables and Spare Parts	109
<b>3</b>	Name Plate	109
<b>4</b>	Marking	110
<b>5</b>	Shipment	111
<b>6</b>	Works Schedule	111
<b>7</b>	Warranty / O&M Contract	112
<b>8</b>	Insurance	112
<b>9</b>	Installation	112
<b>10</b>	Inspection and Test	112
<b>11</b>	Completion	113
<b>12</b>	Submission of Documents	113
<b>13</b>	Payment	113
<b>14</b>	Prices	115
<b>15</b>	Performance Security	116
<b>16</b>	Liquidated Damages	116
<b>17</b>	Notices	116
	Attachment 1 Performance Security Form	118
	Attachment 2 Form for Contract Agreement	120
	Attachment 3 Proforma of Certificate for issue by the Authority After Successful Commissioning of Equipment	123

## **SPECIAL CONDITIONS OF CONTRACT**

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract the corresponding clause number of the GCC is indicated in parentheses, if applicable.

### **1.0 CLIMATE CONDITION**

Precaution and protection against the specific climate conditions in India such as heavy rain, high temperature, high humidity, gales, excessive sunshine, flooding or any other climate conditions which could cause damage upon the Equipment or otherwise interfere with the execution of the works shall be taken. The Equipment to be supplied shall be tropicalized.

### **2.0 CONSUMABLES AND SPARE PARTS**

#### **2.1 Supply of Consumables and Spare Parts:**

The Contractor shall provide the consumables and spare parts as per requirement of Operation & maintenance of Air Quality Monitoring Analyzers System.

#### **2.2 After Sales Services**

The Contractor shall guarantee the availability of all consumables, spare parts, maintenance and repair work for each Equipment at cost basis for at least five (5) years after the O&M period specified in Clause 7 of SCC, unless otherwise specified in the Specifications. Bidder should submit certificates from the manufacturers in support of available service centers and availability of spares parts and consumable in India as per Attachment no. 3A of Section III.

### **3.0 NAME PLATE (GCC CLAUSE 12)**

The Contractor shall affix the name plate with the following description in English on all the Equipment:

- 1) Name of the station
- 2) Name of the Equipment
- 3) Manufacturing date
- 4) Production serial number
- 5) Equipment model number
- 6) Name of manufacturer
- 7) Ratings of the Equipment
- 8) Logo of JSPCB.

### **4.0 MARKING (GCC SUB-CLAUSE 13.2)**

The Contractor shall mark the following information in the sequence described below and, in a frame, commensurate with the size of packing and/or the Equipment.

- 1) Consignee: (Jharkhand State Pollution Control Board & Address), India
- 2) Name of the Works: Supply and O&M of Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV) for JSPCB for the following stations:

**List of the City / Locations where 2 nos. of MCAAQMV shall be delivered:**

- 1) Locations mentioned at Invitation for Bids (IFB).
- 2) Name of the Project: Supply and O&M of Mobile Continuous Ambient Air Quality Monitoring Vans (MCAAQMV): \
  - Contract number:
  - Contractor's name:
  - Port or airport of discharge:
  - Country of origin:
  - Item, and if applicable, package number in sequence, and quantity per package and/or Equipment:
  - Description of Equipment:
  - Net and gross weight and cubic measurement:
  - Shipper's name and/or marks:
  - Caution marks, if applicable:
- 3) Other markings as required by the Board:

**5.0 SHIPMENT (GCC CLAUSE 14)**

The Contractor shall be responsible for the delivery of the Equipment to each Site designated by the Board and for the coverage of shipping charges, freight, insurance premiums up to handling over the Equipment at Sites, inland transportation and temporary storage

5.1 Notification and Submission of Documents Upon shipment, the Contractor shall notify the Board and the Insurance Company by cable of the following details of the shipment.

- 1) Contract number
- 2) Description and quantity of the Equipment
- 3) Name of vessel and air cargo
- 4) Number and date of bill of lading and airway bill
- 5) Date of shipment, port of discharge, expected date of departure and expected date of arrival
- 6) Invoice amount of shipment
- 7) Name of a claim settling agency in India.

5.2 The Contractor shall mail the following documents to the Board, with a copy to the Insurance Company.

**1) Equipment of Foreign Origin:**

- i. Four (4) Copies of the contractor's invoice showing the Equipment's description,

- quantity, unit price and total amount
- ii. Original and Four (4) copies of the negotiable, clean, on-board bill of lading marked freight prepaid and four copies of non-negotiable bill of lading;
- iii. Four copies of the packing list identifying contents of each package
- iv. Insurance certificate
- v. Manufacturer and Suppliers warranty certificate
- vi. Factory test and inspection certificate
- vii. Certificate of country-of origin

The above documents shall be received by the Board at least one week before arrival of the Equipment at the port or place of arrival and. If not received, the Contractor will be responsible for any consequent expenses.

**Partial shipment and transshipment is allowed but within the stipulated time period:**

**2) Equipment to be supplied from within India:**

Upon delivery of the Equipment to the transporters, the Supplier shall notify the Board and mail the following documents to the Board.

- i. Four copies of the Supplier's invoice showing the Equipment's description, quantity, unit price and total amount
- ii. Acknowledgement of receipts of goods from the consignee i.e. receipted delivery note, railway receipt (RR), or truck receipt (LR)
- iii. Supplier's and/or Manufacturer's warranty certificate
- iv. Factory test & inspection certificate and Material Dispatch Clearance Certificate (MDCC) issued by the Board.
- v. Insurance certificate
- vi. Certificate of country of origin

The above documents shall be received by the Board before arrival of the Equipment and, if not received, the Supplier shall be responsible for any consequent expenses.

**6.0 WORKS SCHEDULE (GCC CLAUSE 16)**

**6.1 Equipment to be supplied from Foreign Country:**

Delivery Period for all the packages shall be 90 days from the date of the opening of Letter of Credit (L/C). It relates to completion of delivery on CIF (designated Sea Port / Air Port) basis for equipment of foreign origin. Further transportation to the site where the MCAAQMV's is to be installed and commissioned shall be completed by the contractor within Sixty (60) days from the date of arrival of equipment at port of de- embarkment.

**6.2 Equipment to be supplier from India:**

All the equipment shall be received at Continuous Ambient Air Quality Monitoring Station Sites within 90 days from the date of notification of award and are to be installed and commissioned

within sixty (60) days from date of receipt at site.

### **6.3 Commissioning and others incidental services:**

All the equipment of the awarded package shall be commissioned within 120 days after the date of opening of Letter of Credit (L/C) including all the incidental services i.e. training etc.

### **6.4 O & M Contract**

The contractor shall carry out Operation & Maintenance of Air Monitoring System for a period of five (5) years from the date of commissioning of the station, which can be extended up to extended (3) Years at all mutually agreed rates and terms & conditions.

## **7.0 WARRANTY / O & M CONTRACT (GCC CLAUSE 18)**

### **7.1 Period of O&M Contract**

The Continuous Ambient Air Quality Monitoring System shall be under Operation & Maintenance Contract from the date of commissioning of the station and maintenance of all the equipment including Supply of all material shall be the responsibility of the Contractor during the validity of Operation & Maintenance Contract. The Contractor shall, in addition, comply with the performance guarantees if specified under the Contract. If, for reasons attributable to the Contractor, these guarantees are not attained in whole or in part, the Contractor shall make such changes, modifications, and/or additions to the Equipment or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own costs and expenses and to carry out further performance test.

## **8.0 INSURANCE (GCC CLAUSE 19)**

- A)** The insurance (Comprehensive) shall be in an amount of equal to One Hundred Ten (110) percent of the value of the Equipment up to handing over of the Equipment to the Board on “All Ricks” basis, including war risks and strikes, naming the Board as the beneficiary.
- B)** The Contractor shall take the comprehensive all risk insurance cover for the complete station during O&M period including statutory insurance of Contractor’s personnel. The value shall be 110% of the total value of the Mobile Continuous Ambient Air Quality Monitoring Vans depreciated annually as per standard norms. The same shall be reimbursed by the Board against documentary proof.

## **9.0 INSTALLATION (GCC CLAUSE 20)**

Bidder shall depute Engineer / supervisor for on-site assembly, installation, commissioning and start-up of the supplied equipment. Bidder shall also furnish tools required for assembly, commissioning and maintenance of equipment during O&M period.

## **10.0 INSPECTION AND TEST (GCC CLAUSE 21)**

- 10.1** Unpacking Inspection Unpacking inspection shall be performed by the Contractor to inspect

whether all the items and quantity of the Equipment have been delivered in conformity with the Equipment and packing list without any damage during the shipment. The Contractor shall submit the unpacking inspection report to the Board.

## **10.2 Site Inspection**

The Contractor shall carry out site inspection of the Equipment at each Site at the completion of installation works to confirm that the installation works and the function of the Equipment is satisfactory for the requirements specified in S/W and the Specifications.

The Contractor shall carry out the functional test to ensure that the consumables and spare parts are good for the operation, maintenance and replacement in future.

As a result of site inspection, the Equipment regarded as unsatisfactory or unacceptable by the Board shall be promptly remedied by the contractor. The Contractor shall submit the site inspection report to the Board.

## **10.3 Performance Test**

The Contractor shall carry out the performance test to inspect and witness the function of each of the equipment supplied under the awarded package at site. Performance test shall be carried out in accordance with Sub-clause 4 of S/W for all the Equipment supplied. In case the Equipment for performance test requires the supplemental and/or supporting Equipment, the Contractor shall carry out the performance test including such Equipment.

Performance test will be considered to be complete only after successful completion of performance test of each equipment pertaining to respective packages.

In case of results of such performance test found to be unsatisfactory by the Board same shall be promptly reminded by the Contractor.

The Contractor shall prepare the performance test procedures for approval by the Board at least thirty (30) days prior to the testing schedules. The Contractor submits the performance test report to the Board.

## **11.0 COMPLETION (GCC CLAUSE 23)**

The Contractor shall complete all the Works up to installation and commissioning of MCAAQMV's within 180 days after the date of opening of Letter of Credit (LC).

## **12.0 SUBMISSION OF DOCUMENTS (GCC CLAUSE 24)**

12.1 Work Program Within thirty (15) days from the notification of award of the Contract, the Contractor shall submit the detailed Works program and schedule to the Board indicating the following items:

- a. Equipment Supply program and Equipment layout plan (if applicable)
- b. Design drawings and utility list, if required
- c. Subcontractor list for installation work of the Equipment if not already specified in the Techno-commercial Bid
- d. Program for factory, pre-shipment, unpacking and site inspections and performance test e.

Installation program including personnel organization chart of the Contractor.

The Contractor shall be responsible for any discrepancies, errors or omissions or delay in delivery and submission of the work program, and any expenses resulting there from shall be borne by the Contractor.

## 12.2 Other Documents

The Contractor shall submit the following documents within forty-five (45) days after the notification of award.

<b>Item</b>	<b>Number of Documents to be sent to Authority</b>
Catalogues, product data and test reports	4
Installation manuals	4
List of consumables and spare parts	4
Manufacture's specifications	4
Training program	4

Besides the documents here above, the Contractor shall submit the following documents at the designated time for submissions as follows:

<b>Item</b>	<b>Number of Document</b>	<b>Time of Submission</b>
	<b>Authority</b>	
<b>Inspection report</b>	2	At the time of completion of factory, pre-shipment unpacking and site inspections (if applicable)
<b>Training manual</b>	3	At the time of commencement of installation of Equipment
<b>Operation and maintenance manual</b>	3	At the time of commencement of installation of Equipment
<b>Training program</b>	1	By the time of completion of installation of Equipment
<b>Report of performance test</b>	1	At the time of completion of performance test
<b>Video CD (Optional)</b>	1	By the time of commencement of training
<b>List of Equipment supplied</b>	2	At the time of completion of the Work

Besides the documents here above, the Contractor shall submit the notices, reports, and other

documents when deemed necessary, in accordance with the direction of the Board.

## **13.0 PAYMENT (GCC CLAUSE 25)**

### **13.1 Method of Payment**

The payment shall be made in the currency specified in the contract by means of an irrevocable Letter of Credit (LC) for equipment against dispatch. Other payment shall be made through Cheque /Bank transfer only.

### **13.2 Terms and Conditions of Payment**

Bids with terms and conditions of payment other than that specified below shall be rejected.

#### **(a) Payment for goods and services (excluding O&M charges) supplied from abroad:**

- i. On shipment: Eighty (80) percent of the contract price of the Goods** shipped shall be paid through irrevocable Letter of Credit opened in favour of the supplier in a bank in his country and upon submission of the documents specified in sub-clause 5.2 (1) of SCC including: (i) Packing list and (ii) Supplier's certificate that the amounts shown in the invoice are correct in terms of the contract and that all the terms and conditions of the contract have been complied with and
- ii. On Final Acceptance: Balance Twenty (20) percent of contract price of the equipment** including 100% of the local costs, incidental cost, cost of training after satisfactory completion of installation & commissioning including Training (to be certified by the Board) of all the Equipment of the package at specified site(s) and submission of acceptance certificate as per Attachment 3 of SCC.
- iii. 100% Payment of local currency portion including agency commission shall be paid** after satisfactory completion of installation & commissioning including Training (to be certified by the Board) of all the Equipment that specified site(s).

#### **(b) Payment of goods and services (excluding O&M charges) supplied from India.**

- i. On Delivery: Eighty (80) % of the contract price shall be paid (Through LC) on receipt** of Goods and upon submission of the documents specified in Clause 5.2 (2) of SCC: and
- ii. On Final Acceptance: Balance Twenty (20) percent of contract price of the equipment** including 100% of the local costs, incidental cost, costs of training after satisfactory completion of installation & commissioning including Training (to be certified by the Board) of all the Equipment of the particular package at specified site and submission of acceptance certificate as per Attachment 3 of SCC.

#### **(c) Payment of Operation and Maintenance charges:**

O&M cost of each year shall be paid after end of every quarter in equal installments based on submission of the required air quality report as per annexure X1 to X5 along with data obtained

from calibration documentation. Any penalties applicable if any, as referred in the Scope of Work for O&M Contract and as per the notification of award of contract, shall be deducted from the quarterly payment.

- (d) i) Where payments are to be affected through Letter of Credit (LC), the same shall be subject to the latest Uniform Customs and Practice for documentary credit, of the International Chamber of Commerce.
- ii) The LC will be confirmed at Supplier's cost if requested specifically by the supplier;
- iii) If LC is required to be extended/ reinstated for reasons not attributable to the Purchaser, the charges thereof shall be to the supplier's account.
- iv) Any expenditure for the operation of LC out - side India shall be borne by the beneficiary.

#### **14.0 PRICES (GCC CLAUSE 26)**

The prices quoted shall be firm throughout the tenure of the Contract. Any increased cost incidental to the performance of the Works due to any economic dislocation either in the origin country or India or to any other causes such as currency restriction, price hike of the Equipment, wage hike for labour or revaluation of the currency cannot be claimed by the Contractor to the Board.

#### **15.0 PERFORMANCE SECURITY (GCC CLAUSE 27)**

##### **15.1 Performance Security**

**15.2** The amount of performance security as a percentage of the Contract Price shall be ten (10 %) percent.

#### **16.0 LIQUIDATED DAMAGES (GCC CLAUSE 31)**

##### **16.1 Rate**

The Contractor shall pay to the Board as liquidated damages a sum equivalent to half (0.5) percent of the contract price of each station for per week of delay in commissioning of each station after scheduled date of completion.

##### **16.2 Maximum Deduction**

The total liquidated damages on account of delay in supplies payable to the Board shall not in any case exceed five (5) percent of the Contract price of Supply portion only (Excluding O&M charges).

**16.3** In addition to above Liquidated damages for delay, the Contractor is liable to pay penalty on account of failure of systems during O&M period as elaborated in Section - II (Scope of work) of this document.

#### **17.0 NOTICES (GCC CLAUSE 42)**

Any notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the party to whom the communication is addressed or when sent by registered mail telex, telegram, facsimile to such party at the following address:

**The Member Secretary,  
Jharkhand State Pollution Control Board,  
T.A Division, HEC Complex,  
Dhurwa, Ranchi – 834004 (JH)**

**ATTACHMENT 1**

**Form of Bank Guarantee for Performance Security for Supply Under Buy-Back, Installations, Commissioning and Testing of MCAAQMV.**

(to be stamped in accordance with Stamp Act, if any, of the Country of the issuing Bank)

Bank Guarantee No. -----

Date :.....

Ref. No.:.....

To,

**The Member Secretary,  
Jharkhand State Pollution Control Board,  
T.A Division, HEC Complex,  
Dhurwa, Ranchi – 834004 (JH)**

Dear Sir,

THIS AGREEMENT is made on the -----days of----- 2016 ----- Between [Name of the Bank] of ----- [address of the bank] (hereinafter called “the Guarantor”) of the one part and Jharkhand State Pollution Control Board, Ranchi (hereinafter called “the Board”) of the other part.

**WHEREAS**

- (1) this agreement is supplemental to a contract number ----- (insert Contract Number) (hereinafter called “the Contract”) made between ..... [name of Contractor] of --- ----- [address of Contractor] (hereinafter called “the Contractor) of the one part and the Board of the other part whereby the Contractor agreed and undertook to execute the works of Supply and O&M of Continuous Ambient Air Quality Monitoring Vehicle (MCAAQMV) for JSPCB at against the Contract for the sum of ----- [amount in Contract Currency] being the Contract Price; and
- (2) the Guarantor has agreed to guarantee the due performance of the Contract in the manner hereinafter appearing.

NOW, THEREFORE, the Guarantor hereby agrees with the Board as follows;

- (a) If the Contractor (unless relieved from the performance by any clause of the Contract or by statute or by the decision of a tribunal of competent jurisdiction) shall in any respect fail to execute the Contract or commit any breach of his obligations there under then the Guarantor will indemnify and pay the Board the aggregate sum of ----- [amount of Guarantee shall be ten (10)% (Percent) of the said value of the Contract]----- [in words], such sum being payable in the types and amount of currencies in which the Contract Price is payable, provided that the Board or his Authorized Representative has notified the Guarantor to that effect and has made a claim against the Guarantor before the expiry of O&M period.

(b) The guarantor shall not be discharged or released from his guarantee by an arrangement between the Contractor and the Board, with or without the consent of the Guarantor, or by any alteration in the obligations undertaken by the Contractor, or by any forbearance on the part of the Contractor, whether as to payment, time, performance, or otherwise, any notice to the Guarantor of any such arrangement, alteration, or forbearance is hereby expressly waived.

This guarantee shall be valid for one year from date of successful installation and commissions of entire system as specified in the Contract.

Given under our hand on the date first mentioned above.

SIGNED BY.....

For and on behalf of the Guarantor

(Seal of Guarantor)

in the presence of

(Witness)

**ATTACHMENT 2**

**FORM FOR CONTRACT AGREEMENT FOR SUPPLY AND OPERATION & MAINTENANCE OF MOBILE CONTINUOUS AMBIENT AIR QUALITY MONITORING VANS (MCAAQMV)**

This operation and Maintenance Agreement (“Agreement”) is made on this -- day of by and between:

Jharkhand State Pollution Control Board, India which term shall include permitted assigns and successors (Hereinafter called as “The Board” or “the Owner”).

And

M/s..... - a company incorporated..... with Regd. Office at .....which term shall include permitted assigns and successors (hereinafter called as “Contractor” or “the Contractor”)

**RECITALS**

Whereas the Owner had invited Bids under reference----- for SUPPLY and Operation & Maintenance Continuous Ambient Air Quality Monitoring Station located at:..... and M/s ----- had submitted their bid against the aforesaid invitation to bid and Owner has accepted the bid of M/s ----- and has decided to entrust the job of Supply and Operation & Maintenance (O&M) of the one Air Monitoring Station located at to the Contractor vide Letter of Award ref.----- dated ----- at a total Contract Price for complete scope of work of ----- (Contract Price in Words and Figures) (Hereinafter “the Contract Price”).

Whereas the Contractor has accepted the Letter of Award issued by the Owner in writing vide its letter no.----- dated ----- and has furnished Contract Performance Security for an amount of Rs. ----- [Rupees----- only] and which is initially valid up to ----- and Owner has accepted the said Contract Performance Security.

Whereas, Contractor is having expertise in the business inter alia, of Supply and operation & maintenance of Continuous Ambient Air Quality Monitoring System and the owner has engaged the Contractor to Supply and perform operation and maintenance of said Air monitoring System upon the terms & conditions set forth in this Agreement and the Letter of Award referred above issued by the Owner including all the documents referred in the above Letter of Award.

**NOW THIS AGREEMENT WITNESSETH AS FOLLOWS;**

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:

- i) Scope of Works;
- ii) Financial Bid;
- iii) Technical Specifications;
- iv) General Conditions of Contract;
- v) Special Conditions of Contract; and
- vi) The Board's Notification of Award.

This Contract sets forth the entire contract and agreement between the parties pertaining to the SUPPLY of the Goods described herein and Operation & Maintenance of the Air Monitoring Vans and supersedes any and all earlier verbal or written agreements pertaining to the SUPPLY of the Goods.

This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.

- 3. In consideration of the payments to be made by the Board to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Board to perform the Works and to remedy defects therein conformity in all respects with the provisions of the Contract.
- 4. The Board hereby covenants to pay the Contractor in consideration of the performance of the Works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
- 5. Any notice under the Contract shall be in the form of letter, telex, cable or facsimile. Notices to either party shall be given at such address or addresses as such party shall specify from time to time by written notice to the other. In the absence of such notice to the contrary, notice to the Board shall be properly addressed to:

**The Member Secretary,  
 Jharkhand State Pollution Control Board,  
 T.A Division, HEC Complex,  
 Dhurwa, Ranchi – 834004 (JH)**

And notice to the Contractor shall be properly addressed to: [Contractor's address and electronic transmission address]

.....  
 .....

A notice shall be effective when delivered or on the notice's effective date, whichever is later.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

.....  
 Signature of Board's Authorized Representative

.....

Signature of Contractor Signed,

Sealed and Delivered by the said

(For the Board) in the presence of Signed,

Sealed and Delivered by the said

(For the Contractor) in the presence of

**ATTACHMENT 3**

**PROFORMA OF CERTIFICATE FOR ISSUE BY THE JSPCB AFTER SUCCESSFUL COMMISSIONING OF EQUIPMENT**

No.:.....

Date: .....

M/s

**Sub: Certificate of Commissioning of equipment.**

1. This is to certify that the equipment as detailed below has / have been received in good condition along with all the standard and special accessories (subject to remarks in Para No.2) and a set of spares in accordance with the Contract / specifications. The same have been installed and commissioned.
  - a) Contract No..... dated .....
  - b) Name of CAAQM station/ city .....
  - c) Description of the equipment .....
  - d) Package No. ....
  - e) Quantity .....
  - f) Bill of Lading ..... dated ..... (for import contract)
  - g) Name of the vessel/transporter .....
  - h) RR No. .... dated .....
  - i) Name of the consignee .....
  - j) Date of commissioning and performance test .....

2. Details of recoveries to be made on that account:

Sl. No.	Description	Amount to the recovered

3. The proving/performance test has been done to out entire satisfaction and personnel have been trained to operate the equipment.

JSPCB

CONTRACTOR

4. The contractor has fulfilled his contractual obligation satisfactorily. Explanatory notes for filling up the certificates:
  - a) He has adhered to the time schedule specified in the contract in dispatching the documents drawing pursuant to Technical Specifications.
  - b) He has supervised the commissioning of the item in time i.e. within the period specified in the contract form the date of intimation by the Purchaser in respect of the installation of the plant.
  - c) Training of personnel has been done by the contractor specified in the contract.
  - d) In the event of documents/drawings having not been contractor or installation and commissioning of the plant have been delayed on act of the contractor, the extent of delay

should always be mentioned.

OR

The contractor has failed to fulfill his contractual obligations with regard to the following  
i.e. instruction or training etc.

- a.
  - b.
  - c.
  - d.
5. The amount of recovery, on account of non-SUPPLY of accessories and spares is given under Para No. 2. 6.
  6. The amount of recovery on account of failure of the contractor to meet his contractual obligations is as indicated in endorsement of the letter.

Signature .....

Name .....

Designation with stamp.....

Member Secretary  
Jharkhand State Pollution Control Board

**ATTACHMENT 4**

**PROFORMA FOR BANK GUARANTEE TO BE FURNISHED FOR O&M CONTRACT (TO BE STAMPED IN ACCORDANCE WITH STAMP ACT, IF ANY, OF THE COUNTRY OF THE ISSUING BANK)**

Bank Guarantee No .....

Date.....

In consideration of (Name of the Board) (hereinafter referred to as “Employer” which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to .....with its Head Office at (herein-after referred to as ..... or ..... “Contractor”) a Contract for SUPPLY and Operation & Maintenance of Continuous Ambient Air Quality Monitoring Mobile Van (MCAAQMV), vide Contract No..... dated ..... and the same having been unequivocally accepted by the Contractor resulting in a “Contract”, which award is on the strength of Form of Certificate by the O&M Partner in India for Carrying out O&M of MCAAQMV dated..... (hereinafter referred to as “Undertaking”) given by M/s.....(O&M Partner) having its registered office at (hereinafter called O&M Partner), and the Contractor having further executed with.....(O&M Partner) a Sub-Contract dated .....and the same having been unequivocally accepted by the O&M Partner ..... resulting in a.....Sub-Contract Agreement for(hereinafter called “Sub-Contract Agreement”) and(O&M Partner) having agreed to provide a Performance Guarantee amounting equal to two (2) quarterly O and M charges in addition to the Contract Performance Security to be provided by the Contractor to the Employer on the terms and conditions specified in the “Undertaking”.

We.....Bank, having its Head Office..... (herein-after referred to as the “Bank”, which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay to the Employer on demand any and all monies to the extent of (Specify currency and amount in words and figures) only as aforesaid at any time up to @ without any demur, reservation, context, recourse or protest and/or without any references to “O&M Partner” or “Contractor”. Any such demand made by the Employer on the Bank shall be conclusive and binding, notwithstanding any difference between the Employer and Contractor and/or between the Employer and O&M Partner or any dispute pending before any Court, Tribunal, Arbitrator or any other Authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Employer and further agrees that the guarantee herein contained shall be enforceable till ninety (90) days after expiry of its validity.

The Employer shall have the fullest liberty, without affecting in any way the liability of the Bank under this guarantee, from time to time to extend the time for performance of the Contract or the Component Agreement by the O&M Partner. The Employer shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the O&M Partner and to exercise the same at any time, in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract or Undertaking or any other course or remedy or security available to the Employer. The Bank shall not be released of its obligations under this presents by any exercise of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Bank from its obligations.

The Bank also agrees that the Employer at is option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against Contractor or O&M Partner and notwithstanding any security or other guarantee that the Employer may have in relation to Contractor's or O&M Partner 's liabilities.

Notwithstanding anything contained hereinabove our liability under this guarantee is restricted to ..... and, it shall remain in force upto and including @ ..... and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s ..... (O&M Partner) on whose behalf this guarantee has been given.

This guarantee shall be valid for one year after successful commissions of entire system from the date of expiry of O& M period (i.e. 5 Years) as specified in the Contract.

Date this .....day of .....2025 ..... at .....

WITNESS:

(Signature).....	(Signature).....
(Name).....	(Name & Designation).....
(Official Address).....	(Bank's Seal).....

Authorized vide Power of

Attorney No.....

Date.....

Brief Name of the Contractor

@ The date will be ninety (90) days after the end of the defect liability period as specified in Contract.

**NOTE :**

1. The stamp papers of appropriate value shall be purchased in the name of the Guarantee issuing Bank.
2. (i) The Bank Guarantee from a Bank in the list of Banks at Attachment - 15 to Section - III of bid documents.

**Annexure - X1**

**MONTHLY FIELD CHECK LIST OF  
(To be filled by JSPCB officials deputed)**

**MCAAQMV UNDER OPERATION CONTRACT ---(name of the city)**

<b>Sl. No.</b>	<b>Description</b>	<b>------(name of the Station) Station</b>	<b>Remarks</b>
<b>1.</b>	Station Visit Date		
	(i) 1st Week		
	(ii) 2nd Week		
	(iii) 3rd Week		
	(iv) 4th Week		
<b>2.</b>	SOP Available at Station		
<b>3.</b>	Environmental Condition of Station		
<b>4.</b>	Protocol of Station available		
<b>5.</b>	Availability of Calibration Gas		
<b>6.</b>	Availability of NIST Traceability		
<b>7.</b>	Bi Weekly Calibration Done (Precision check, two point calibration check)		
<b>8.</b>	Full Calibration Done (Multipoint Calibration check)		
<b>9.</b>	Insurance Validity		
<b>10.</b>	Electricity Bill Paid, if any		
<b>11.</b>	Telephone Bill Paid, if any		
<b>12.</b>	Security Guard Payment, if any		
<b>13.</b>	Servicing of ACs Installed, if any		
<b>14.</b>	Data Display Board Working		
<b>15.</b>	O&M Rate - Cheque payment, if any		
<b>16.</b>	Name of the Company Engineer Deputed/ Present		
<b>17.</b>	Data Analyst at Central Station Deputed/ Present		
<b>18.</b>	Log-Book maintained and observation entered.		
<b>19.</b>	Date Received (Daily/ Monthly)		
<b>20.</b>	Name of the visiting Official of SPCB		
<b>21.</b>	Special Remarks, if any		

..... Signature of JSPCB official

**Annexure- X2 TO X5**  
**Jharkhand State Pollution Board**  
**Mobile Continuous Ambient Air Quality Monitoring Report**  
**(MAIN POLLUTANTS)**

**To be submitted daily at 06 morning for that day ending at next 06 morning**

Daily Report

Station Name:-----

Month:-----

Report No. :

Date:

Monitoring Location :

Data Interval: 1 Hr. Average

Monitoring Conducted By:-----

Hrs.	NO	NO <sub>2</sub>	NO <sub>X</sub>	NH <sub>3</sub>	SO <sub>2</sub>	CO	O <sub>3</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	Benzene	Toluene	Ethyl Ben	MP Xylene	O xylene
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ppb	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
06-07Hr.														
07-08 Hr.														
08-09 Hr.														
09-10 Hr.														
10-11 Hr.														
11-12 Hr.														
12-13 Hr.														
13-14 Hr.														
14-15 Hr.														
15-16 Hr.														
16-17Hr.														
17-18 Hr.														
18-19 Hr.														

Hrs.	NO	NO <sub>2</sub>	NO <sub>x</sub>	NH <sub>3</sub>	SO <sub>2</sub>	CO	O <sub>3</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	Benzen e	Tolu e n e	Ethyl Ben	MP Xylene	O xylene
	μg/ m <sup>3</sup>	μg/ m <sup>3</sup>	ppb	μg/ m <sup>3</sup>	μg/ m <sup>3</sup>	μg/ m <sup>3</sup>	μg/ m <sup>3</sup>	μg/ m <sup>3</sup>	μg/ m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>
19-20 Hr.														
20-21 Hr.														
21-22 Hr.														
22-23 Hr.														
23-00 Hr.														
00-01 Hr.														
01-02 Hr.														
02-03 Hr.														
03-04 Hr.														
04-05 Hr.														
05-06 Hr.														
MINIMUM														
MAXIMUM														
AVERAGE														
Data Captured														
Note :														

**Continuous Ambient Air Quality Monitoring Report  
(Mean Concentration of Main Pollutants)**

Year .....

Monitoring Location: .....

Months	NO	NO <sub>2</sub>	NO <sub>X</sub>	NH <sub>3</sub>	SO <sub>2</sub>	CO	O <sub>3</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	Benzene	Toluene	Ethyl Ben	MP Xylene	O xylene
	μg/m <sup>3</sup>	μg/m <sup>3</sup>	ppb	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>	μg/m <sup>3</sup>
January														
February														
March														
April														
May														
June														
July														
August														
September														
October														
November														
December														
MINIMUM														
MAXIMUM														
AVERAGE														

**Annexure I(1)**

**Calculation of City-wise Payment for O & M Charges on Quarterly Basis for MCAAQMV under O & M Contract**

Bill raised for O & M Charges by M/s .....							Invoice No. ....
.....							Date .....
Bill raised for spares and consumables							Invoice No. ....
.....							Date .....
<b>Total Amount</b>							
<b>Name of the Station</b>		<b>STATION I (Location .....)</b>		<b>STATION II (Location ..... )</b>		<b>STATION III (Location .....)</b>	
Quarter No.:							
Duration:							
Year:							
Percentage of valid monthly data captured rate %	Month 1						
	Month 2						
	Month 3						
<b>Average Quarterly Data Captured Rate</b>							
		Price for service portion 70%	Price for material part & other incidental charges 30%	Price for service portion	Price for material part & other incidental charges	Price for service portion	Price for material part & other incidental charges
<b>Base Amount per Quarter (as per No A) (A)</b>							
<b>Proportionate Amount based on Valid Data Captured Rate (B)</b>							
Formula: see at footnote*							
(Specimen Calculation sheet attached in <b>Annexure I</b> )							
<b>Applicable Deduction as per penalty provision for continuous non-functioning (C)</b>							
(Specimen Calculation sheet attached in <b>Annexure II</b> )							
<b>Any Other Deduction, specify with justification(D)</b>							

Applicable Taxes & Duties(E) - Service Tax - Education Cess - Secondary & - Higher Education Cess CST						
Net Amount Payable ( ^ ) [ F = B- (C+D) +E]						
<b>Total O&amp;M cost Payable (Station Wise)</b>	<b>(i)</b>		<b>(ii)</b>		<b>(iii)</b>	
<b>Total Amount Payable ( ^ ) for O&amp; M cost for City for quarter no. 1/2/3/4 of year 2025 (i+ ii + iii)</b>						

\* Percentage quarterly data captured rate/ 85% X A

**Annexure I (2)**

**(Ref.: Invoice no-----dated ----- for the period ----- )**

<b>Name of Station*</b>	<b>Name of non – functional system</b>	<b>Total period of continuous non-functioning (days)</b>	<b>Period considered for penalty calculation after grace period**</b>	<b>Penalty amount (period x unit rate)</b>

**Annexure II**

**(Ref.: Invoice no-----dated ----- for the period ----- )**

Name of Station*	Observed Monthly Data Captured Rate														Average Percentage Data Capture Rate
	For gases pollutant						Dust Particles		For Mat. Parameters						
	NO2	O3	SO2	CO	NH3	BTX	PM2.5	PM10	Temp.	RH	WS	WD	SR	RF	

\*(To be prepared & submitted separately for each station)

**\*Similarly seasonal variations and yearly graphs with Annual Report to be submitted by the successful bidder**

**VOLUME-II**

**TECHNICAL SPECIFICATIONS**

**FOR**

**MOBILE CONTINUOUS REAL TIME AMBIENT AIR  
QUALITY MONITORING VAN**

## SCHEDULE OF REQUIREMENTS

The equipments are intended for one Mobile Continuous Ambient Air Quality Monitoring Van (MCAAQMV). The system should be completely functional. Any balance of material not specified but required for the purpose must be supplied by the vendors.

Sl. No.	Name of the instrument/ Equipment/ Item	Quantity (Nos)
1.	Continuous Ambient Carbon Monoxide (CO) Analyzer	One
2.	Continuous Ambient Sulphur Dioxide (SO <sub>2</sub> ) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen (NO/NO <sub>2</sub> /NO <sub>x</sub> ) Analyzer	One
4.	Continuous Ambient Ammonia (NH <sub>3</sub> ) Analyzer	One
5.	Continuous Ambient Ozone (O <sub>3</sub> ) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM <sub>10</sub> Particulate Matter Monitor	One
8.	Automatic PM <sub>2.5</sub> Particulate Matter Monitor	One
9.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
10.	Multi-calibration systems for Gas Calibration and Meteorological, Flow and Electronic Calibration	One Set
11.	Sensor based instrument to measure Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank- up Meteorological Tower.	One Set
12.	Computer system consisting of one PC along <i>Colour Laser printer with latest specification</i> , and DAS at the monitoring station with peripherals. Software for data acquisition/ Data transfer and system integration, telephone, Modem.	One Lot
13.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analysers with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line Fittings, Tools(electrical and mechanical).	One Unit
14.	Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin.	One Unit
15.	Air Conditioner, Split Type, Roof Mounted along with voltage stabilizer (2 x 2 ton)	Two Unit
16.	6.5 KVA petrol generator (2 nos.)	One Unit
17.	Online UPS (1x5 KVA, 2 <b>Hours</b> backup)	One Unit
18.	Arrangements like Thermally Stable Housing (Body Built up) for installation of Continuous Ambient air quality Monitoring analyzers with Sampling line, Internal fitting, Instruments racks, Electrical and	One Set

	Gas line Fittings, Tools (electrical and mechanical).	
19.	<p><b>G.P.S. SYSTEM</b></p> <p>The van should have GPS tracking facility and Wi-Fi facility so that its movement can be monitored from Head Office. Integrated GPS &amp; 3G modules for location tracking and wireless communication</p> <ul style="list-style-type: none"> <li>• To operate with GPS / GSM / GPRS wireless network - GPS chipset with high sensitivity</li> <li>• GPRS with sim card.</li> <li>• Intelligent activation of GPS positioning</li> <li>• To start working automatically after electrifying - Built-in ON / OFF power, wide voltage input range - Built-in monitoring CPU, eliminating breakdown automatically</li> <li>• Commands and location information received by SMS</li> <li>• Easy to install, open or hidden installment alternatives</li> <li>• Two power input approaches: car-specific joint or car battery - Antenna: Built-in GSM, GPS antenna with low noise and high gain.</li> </ul>	As Specified
20.	<p>Seating arrangement:</p> <p>The basic van provided by the client shall be with company fitted driver seat +1 seat. Additional two seats, with Seat belts, shall be provided as under:</p> <ul style="list-style-type: none"> <li>• All the seats shall be firmly fixed and secured properly. - Seats shall have capacity to bear 400 kg weight.</li> <li>• All seat cushions shall be of good conditions with new soft upholstery. Prior approval for material quality and make shall be taken from engineer in charge.</li> </ul>	As Mentioned
21.	<p>Fresh Water Tank and Drain Water Tank and Wash basin</p> <ul style="list-style-type: none"> <li>• Fresh water overhead storage Tank of about 50 liter (plastic) shall be fixed on the top of the roof of the van.</li> <li>• The drain water tank (15 ltrs) shall be made of 3mm thick, food grade plastic, to be mounted underneath the platform table. Total 2 such tanks shall be provided (One for inlet water supply to the wash basin tap and the Second for collection of waste water from wash basin)</li> <li>• The waste water tank should be fitted with controlled drainage facility to drain the waste water as and when required.</li> <li>• Both the Tank shall be easily removable for any sort of Maintenance and Cleaning purpose</li> <li>• Wash Basin: Stainless Steel (SS) wash basin with SS water tap of supplying water.</li> <li>• A separate 0.5 HP pump (to be operated on external electricity) to fill-up the overhead water tank shall be provided and fixed at the appropriate place, near the</li> </ul>	1+1 (W) total 2

	washbasin. Prior approval for material quality and make shall be taken from engineer in charge	
22.	Fire extinguisher mounting: A proper heavy duty bracket support (powder coated on MS structure) should be provided beside storage 1 for placing a fire extinguisher. 1 No. of 2 Kg capacity in Driver cabin and 1 no of 6 Kg in Laboratory area.	2 Units
23.	First aid kit: Cotton rolls, Iodine, Scissors, Boric acid powder, Band aid strips. All other accessories and medical facility.	One Unit

## TECHNICAL SPECIFICATIONS

### 1.0 MOBILE MONITORING VAN

#### 1.1 Specification of the Vehicle:

Engine Type	TATA 1616 LPT (Bharat Stage VI) Or equivalent with same suitable dimensions of any other make.
Engine	3.3 L NG BS VI
Max. torque	475 - 400 Nm
Clutch	Single plate dry friction type – 330 mm dia
Gear box (Transmission)	G550 (6F,1R), Cable Shift Mechanism
Fuel tank capacity (in liters)	160 Ltrs
Battery	12 V - 100 Ah capacity
Ground Clearance	225 mm
Wheel Base	4920 mm
Cargo Body Length	22 ft
Cargo Body Width	7.6 ft

#### 1.2 Dimensions of the Chassis- Thermally Stable Housing (Body Built up)

- Inside minimum length: Approx. 5200 mm
- Inside minimum width: Approx. 2200 mm
- Inside minimum height: Approx. 1800 mm

#### 1.3 Frame:

All the material used for the construction of the floor, frame, roof frame etc, the 4 corner posts and 8 integrated, reinforced container corners should be of metal.

The exterior panel of the container shall be made of pre-coated 1.2 mm MS Sheet of approved colour shade with minimum thickness 1.2 mm and inner layer of Anodized Aluminium / MS sheets, minimum thickness 1.2 mm painted material with full rain, sun and environment protection. All other steel parts should be hot-dipped galvanized having minimum rate of galvanisation of 275 gram per square meter. All joints of like metal such as steel-to-steel or aluminium to aluminium shall be protected against corrosion by liberal application of joining compound.

All joints of dissimilar metals such as steel to aluminum shall be protected against corrosion due to galvanic action by liberal application of dielectric compound as well as jointing compound on both mating surfaces.

For lifting / fixing the container, International Standard eyebolts should be provided at the corners.

**1.4 Paneling:** The outer panelling will be of 1.2 mm of Pre-coated MS sheet to withstand external impacts and abrasions. Outer side of the MS Sheet i.e. exposed face of the sheet, shall be permanently colour coated with silicon modified polyester coating of dry film thickness (DFT) 20

micron (min.) of approved colour shade over primer. Inner face of the sheet shall be provided with suitable pre-coating of minimum 7micron off-white colour. The inner paneling will be of PVC coated 2 mm thick aluminium sheet, fixed over an inlay of 4 mm marine plywood. 100 mm thick polyurethane insulation will be used between the outer and inner walls (Pre-coated MS sheet and Marine plywood) as insulating material. Z spacers if required shall be made out of at least 2mm thick galvanized steel sheet of grade 275 as per Indian Standard.

**1.5 Floor:** The floor should be of acid and alkaline resistant, waterproof, easily cleanable / washable. Bottom plate of thickness 2 mm hot dipped galvanized MS Plate shall be provided.

**1.6 Outer Door:** One door of size approx. 2000 x 900 mm will be provided at the front side (L = 4200 mm) of the station with isolated 3 - point locking & door handle flush fitted.

**1.7 Electric Power Supply Box:** Single- phase (1 Ø) electrical wiring will be laid in ducts. Copper wiring of appropriate gauge will be used. The terminal board should be mounted in a central power distribution box. Over voltage protection for each phase shall be provided along with the lightning arrester. 2 numbers Emergency cut off switch & Thermostat switch (350 C) for power disconnection, 6 free sockets and 3 fluorescent lamps for lighting will be provided. The station shall be properly grounded with chemical earthing or as per BIS Standards with proper plate and only copper strip at least on 2 corners (diametrically opposite). One energy meter (Digital Type) shall be installed. Weatherproof cubicles / enclosures for housing of MCB / TP & N Switch of main power termination (outside shelter) and weather proof telephone junction box for terminations of telephone line are to be provided. Proper earthing for the telescopic mast of the meteorological system shall be provided. There should be a connection between the telescopic mast of the meteorological system and the station. The guy ropes, or wires shall be provided for supporting the mast.

**List of Consumables:**

- All Fuses : 02 set
- Lightning arrester: 02 set
- Emergency Switch: 02 pcs
- Thermostat: 01 pcs

**1.8** The housing will be partitioned as per the drawing to create space for storing of gas Cylinders, Meteorological mast. The minimum size will be 2000 x 1400 x 2300 mm. A lockable door of minimum size 900 x 2000 mm along-with 3 - Point locking system shall be provided on the outer wall of the housing. A 300 mm, single-phase (230 volts  $\pm$  10 volts and 50 Hz  $\pm$  3%) exhaust fan with safety grills will be provided. Mounting brackets in 2 levels for fixing at least 06 (six) gas bottles should be provided. The internal lights of the housing should be sensor-based.

Air conditioners shall be mounted on proper rust-proof supporting structures with rubber blocks to avoid vibration of structures. Proper caging/grill should also be provided for the safety of ACs. Sun shades for external AC units shall be provided with fabricated pre-coated MS sheet (same as monitoring station) with supporting arrangements. AC unit's external piping shall be

placed in GI trays. Cable trays fixed on exterior wall shall be covered with pre-coated MS sheet, of same colour shade of monitoring station. Roof top sheet to be levelled and sloped properly. Rain water spout shall be fixed at top with rain water down pipe at two corners. The external lights of the station should be solar-operated.

### **1.9 Station Furnishing:**

- (i) 19” or suitable racks – 2 or 3 Nos
- (ii) Fire extinguishers - 2 Nos.
- (iii) Furniture:
  - a. Material - Furniture made of water-resistant laminated board.
  - b. Working table
  - c. Revolving tilting chair/stool – 1 No.
- (iv) Miscellaneous
  - a. The exhaust gases from the analyzer should be collected and discharged by a common exhaust pipe and vented.
  - b. Ladder for roof access
  - c. Thermostat for measuring the temperature.
  - d. Hygro Meter for measurement of Humidity inside the station
  - e. No smoking stickers
  - f. Vacuum cleaner of reputed make with minimum 100-watt power
  - g. Tool Kit having following tools:
    - 1. One screwdriver set
    - 2. One multi-meter (Philips, Mico make)
    - 3. One box spanner set
    - 4. One D spanner set
    - 5. One watch maker set
    - 6. One Hammer set
    - 7. One precision screwdriver set
    - 8. One pliers set
    - 9. One Tong tester
    - 10. One Soldering Iron with stand
  - h. One Emergency LED Cluster light
  - i. Sign boards along-with logo of Authority/ Funding Agency as applicable to be embedded with size 1500 x 900 mm on the front of the container and on the two side of the container, The name of the Station i.e. Continuous Ambient Air Quality Monitoring Station, (Location) both in English and local language to be inscribed.

The Signs boards to be mounted on the station with proper spacers.

## 2.0 AIR CONDITIONER

- i. Type: 2 Nos. split type, with an automatic timer. Separate Voltage stabilizer will be provided with each unit.
- ii. Capacity: 2.0 Ton (2 Nos.). The indoor units should be running alternately at an interval of four hours with timer control and the temperature inside the station should be maintained at 25°C inside during peak summer months.
- iii. Nominal Cooling: Btu /hr - 24000, Kcal / hr: 6000
- iv. Fan type: Propeller Fan
- v. Fan Motor type: Permanent Split Capacitor, 1/8 Horse power
- vi. Control Type: Remote
- vii. Compressor: Reciprocating
- viii. Refrigerant: Eco-Friendly
- ix. Power Supply: 230 volts  $\pm$  10 volts AC and 50 Hz  $\pm$  3%.

## 3.0 ONLINE UNINTERRUPTED POWER SUPPLY (UPS)

### 3.1 ONLINE UPS 10 kVA, CAPACITY (Three Phase I/P & Single Phase O/P, with 02 hours backup) (for Air Conditioner)

Three phase 10 kVA UPS along with Automatic Delayed Restoration Device (ADRD) with 2 hour backup in full capacity should be provided for the smooth operation of one 2 Ton capacity split AC at the station.

Sl. No.	Items		Specification
1	Capacity		10.0 kVA
2	Technology		PWM using IGBT / MOSFETS
3	Crest Factor		More than 3: 1
4	Input	Voltage	415 V AC
		Voltage Range	$\pm$ 25%
		Frequency	50 Hz $\pm$ 3%
5	Output	Voltage	250 V AC
		Voltage regulation	$\pm$ 1%
		Frequency	50 Hz
		Frequency regulation	$\pm$ 0.01%
		Waveform	Pure sine wave
6	Battery	Battery type	Sealed maintenance-free
		Backup time	2 Hours at full load
		Battery Capacity	For the required backup time
7		Recharge time	5 hrs to 90% after completing discharge
8	Distortion		Less than 1% on linear load
9	Power factor		0.9 to 1

<b>10</b>	Indicator		<b>L.E.D. – Battery Charge, Load level, online, overload, on battery, replace battery</b>
<b>11</b>	Alarm		<b>Audible alarm for battery backup, battery low and fault</b>
<b>12</b>	Protections	Surge	<b>Surge suppression meets BIS or International standard</b>
		Overload	<b>Fuse &amp; current limited</b>
		Short circuit	<b>Fuse &amp; current limited &amp; cut – off</b>
<b>13</b>	Overload		<b>110% for continuous load</b>
<b>14</b>	Efficiency		<b>More than 90%</b>
<b>15</b>	Environment	Operating Temp	<b>0 – 500 C</b>
		Operating Hum.	<b>10% to 95% (Non condensing)</b>
		Audio Noise	<b>Less than 45 db (at 1 meter)</b>

### **3.2 ONLINE UPS 5 KVA, CAPACITY (Single Phase I/P & Single phase O/P, with 02 hours backup) ( 01 for Analyzers)**

Single-phase 5 kVA UPS along with Automatic Delayed Restoration Device (ADRD) with 2 hours backup in full capacity should be provided for the smooth operation of Analyzers and peripherals at the station:

<b>Sl. No.</b>	<b>Items</b>		<b>Specification</b>
1	Capacity		<b>5.0 kVA</b>
2	Technology		<b>PWM using IGBT / MOSFETS</b>
3	Crest Factor		<b>More than 3: 1</b>
4	Input	Voltage	<b>230 V AC</b>
		Voltage Range	<b>± 25%</b>
		Frequency	<b>50 Hz ± 3%</b>
5	Output	Voltage	<b>230 V AC</b>
		Voltage regulation	<b>± 1%</b>
		Frequency	<b>50 Hz</b>
		Frequency regulation	<b>± 0.01%</b>
		Waveform	<b>Pure sine wave</b>
6	Battery	Battery type	<b>Sealed maintenance free</b>
		Back up time	<b>2 Hours at full load</b>
		Battery Capacity	<b>For required backup time</b>
		Recharge time	<b>5 hrs to 90% after completing discharge</b>
7	Distortion		<b>Less than 1% on linear load</b>
8	Power factor		<b>0.9 to 1</b>

9	Indicator		<b>L.E.D. – Battery Charge, Load level, online, over load, on battery, replace battery</b>
10	Alarm		<b>Audible alarm for battery backup, battery low and fault</b>
11	Protections	Surge	<b>Surge suppression meets BIS or International standard</b>
		Overload	<b>Fuse &amp; current limited</b>
		Short circuit	<b>Fuse &amp; current limited &amp; cut – off</b>
12	Overload		<b>110% for continuous load</b>
13	Efficiency		<b>More than 90%</b>
14	Environment	Operating Temp	<b>0 – 500 C</b>
		Operating Hum.	<b>10% to 95% (Non condensing)</b>
		Audio Noise	<b>Less than 45 db (at 1 meter)</b>

#### **4.0 CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYSERS for SO<sub>2</sub>, NO<sub>2</sub>- NO<sub>x</sub>, NH<sub>3</sub>, CO, O<sub>3</sub> and BTX 4.1**

##### **4.1 (General Specifications for all Analyzers)**

*(\*Technical specifications of all the equipment's must be in compliance of Central Pollution Control Board and/or USEPA certified.)*

- 4.1.1 The analyzers should be 19” rack mounting model with facilities for fixing the analyzers from front side.
- 4.1.2 The front panel preferably have ON / OFF Switch.
- 4.1.3 The display of the entire important status signal viz. Sample flow, temperature, concentration, range selection, manual / auto mode, zero / span mode and all error messages should be on front panel.
- 4.1.4 The analyzers should operate at operating voltage 230 volts  $\pm$  10 volts AC and 50 Hz  $\pm$  3% frequencies. The power supply input to be protected against spikes from and to the analyzer by an LC filter. The power connection cable should be CEE type complete with 15 Amperes plug adaptable to Indian mains socket.
- 4.1.5 The analyzers must function properly in Indian conditions without any defect between 0 – 50° C ambient temperature, 10 – 95% relative humidity and in high ambient dust levels. The data capture rate should not be less than 90% of operational time.
- 4.1.6 The Manufacturer shall provide comprehensive hands-on training for operational & preventive maintenance for one week in the respective State for three persons per station.

4.1.7 The analyzers should complete with calibration system. The calibration system should be delivered along-with respective span gas cylinder / permeation tubes. The span gas concentration should be within 60 – 90% of first measuring range. The analyzer must have zero-point internal calibration system and in agreement with minimum detection limit of each analyzer. The calibration procedures are to be integrated into the software system for automatic calibration & remote calibration.

## **CALIBRATION GAS CYLINDER**

4.1.8 The supplier has to supply the calibration gas cylinder (highly polished aluminium 10 liters water capacity), along with SS Regulator, traceable to NIST for each component (SO<sub>2</sub>, NO, CO, NH<sub>3</sub>, Benzene & Toluene) along with SS regulator for the multipoint calibration. The synthetic air and N<sub>2</sub> cylinder (99.99% purity with certificate) should be in Carbon Steel cylinder of 47 Liters water capacity along with SS Regulator.

4.1.9 The analyzers shall be supplied with all ancillaries necessary for operation with pump (preferably in built) and any other items such as charcoal scrubber, Teflon air sample intake filter, drier, Teflon tubing suitable for connection to air sampling manifold. All such items are to be itemized. Dust filter in all the analyzers should be provided before solenoid valve to protect frequent chocking of solenoid valve.

4.1.10 The connector systems for out-going signal for recording and the computer terminal should be on back panel with screw type connecting pins.

4.1.11 All ambient gas analyzers shall be approved by the USEPA / TUV. However, in case of BTX and Ammonia Analyzer specifications as given will be considered. Method of measurement used shall also comply with the stipulation on National Ambient Air Quality Standards (NAAQS) 2009 (Details of Methods of Measurement is available at MOEF and CPCB websites). All analyzers shall be micro – processor controlled with automatic calibration using an external dilution calibrator and calibration standards. All analyzers should be fully integrated in the rack cabinet, fully calibrated & tested before supply and ready for start – up at the respective sites. Analyzer must exhibit performance equal to or better than values specified in the Calibration & test certificate provided with each analyzer.

4.1.12 The manufacturer shall specify the cross sensitivity of measurement for all the analyzers.

4.1.13 Each set of analyzers shall be supplied with two copies of elaborate operation manuals comprising details as below:

- Parts (I) should comprise installation, operational and troubleshooting details;
- Parts (II) should have details about preventive, routine and corrective maintenance;
- Parts (III) should comprise details of all electrical, electronic and pneumatic circuit

diagrams, details of each spare parts, catalogue No. etc. and details of each electronic card / PCB's; and

- Parts (IV) Schematic diagram for possible repair & maintenance.
- Parts (V) Standard Operating Procedure (SOP) for each analyzer.
- Parts (VI) List of equipment's and other accessories along with contact details of supplier

#### 4.1.14 **Digital Output:**

- a) Multi drop RS 232 port shared between gas Analyzers, Dust Analyzer (PM<sub>2.5</sub>& PM<sub>10</sub>), Meteorological Sensors and computer for data, status and control. Communication should have a USB port, TCP/IP Ethernet connection.

#### 4.1.15 **Quality Control and Standard**

Data shall be collected and validated according to US EPA standards, using the methodologies included in 40 Code of Federal Regulations. All analyzers shall have current US EPA reference or equivalent method designation and shall be of the latest design.

The supplier shall submit a Standard Operating Procedure for the air quality monitoring stations to the Buyer at the time of bid submission. This Standard Operating Procedure shall be approved by the Buyer prior to award. The Standard Operating Procedure shall contain the following:

- i. Operating procedures for all analyzers and meteorological sensors
- ii. Calibration procedures
- iii. Calibration schedule
- iv. Maintenance procedures
- v. Maintenance schedule
- vi. Data validation procedures
- vii. Quality Assurance procedures
- viii. Sample quality assurance documentation
- ix. Sample Air Quality Report

The calibration procedures for analyzers shall conform to US EPA methodologies and shall include daily calibration checks, by weekly precision checks and linearity checks every six weeks. All analyzers shall undergo full calibration in every three months. Data obtained from these calibration checks and copies of associated Quality Assurance and calibration documentation, shall be submitted to the Buyer along with the Air Quality Data. Air Quality Data shall be submitted to the Buyer on Real Time basis through automated system and on a monthly basis in the form of an Air Quality Report. This report shall include tabular and graphic information on gas and dust concentrations as well as meteorological data for each site. The data shall be reported in the form of 15-minute

averages and shall also include daily, weekly and monthly averages, minimum, maximum, standard deviations, total data captured and percent data capture. It should also have stat validation mechanism and delayed data check mechanism. The Air Quality Report shall also include wind roses where wind speed and direction are measured.

## **4.2 SAMPLING SYSTEM**

A suitable sampling system as specified by USEPA having 10 ports manifold and fitted with a suction pump to draw ambient air. System duly equipped with moisture removal systems should be provided for sampling of ambient air separately for gaseous and dust measurement.

### **Gases sampling system:**

- 4.2.1 Height of the sampling system: Approx. 1.0 meter above the roof
- 4.2.2 Roof entry cut out: Stainless Steel
- 4.2.3 Conduit : Stainless Steel
- 4.2.4 Inner sampling system: Borosilicate glass
- 4.2.5 Sampling head : Stainless Steel
- 4.2.6 Manifold : 10 port for tubes 6 x 1 mm, self-tightening.
- 4.2.7 Sample air flow sensor: Uni-directional sample air flow measuring device should be installed at the sampling system to measure the flow of ambient air through sampling system. The output of signal should be connected to computer to ascertain the continuous flow of sample from ambient air. The suction pump operational status should also be connected to the computer as a separate channel.

## **4.3 19" RACK Suitable**

19" Rack cabinet to accommodate all analyzers, calibrators, zero air generators, data logger etc. The dimension of the rack without doors, with aluminum section and rear of 2 mm steel sheet, one removable roof plate, fitted with 4 lifting eyebolts. Four roof fixing screws included in package to replace the lifting eyebolts. One gland plate three-part, one pair of 475 mm (19") mounting angles depth adjustable in 25 mm pitch pattern fitted on two fixing angles approximately 150 mm unit from the front standard. To accommodate panel width of 19" size: width = 600 mm, Height = 1400 mm and Depth = 800 mm. The 19" racks should be screwed to the floor of the station with anti-vibration pads. All nuts and bolts shall be cadmium coated.

## 5.0 AMBIENT AIR QUALITY MONITORING ANALYSERS (GAS)

### 5.1 AMBIENT SULPHUR DIOXIDE (SO<sub>2</sub>) ANALYSER

01.	Principle	Pulsed UV Fluorescence
02.	Measurement	SO <sub>2</sub> in Ambient Air
03.	Display	Digital
04.	Ranges	Auto ranging 0 - 200 ppb
05.	Lower Detectable Limit	1 ppb
06.	Noise Level	0.5 ppb
07.	Zero Drift	< 1 ppb/24 Hrs. with automatic zero compensation
08.	Span Drift	<1 ppb in 24 hrs.
09.	Linearity	± 1% of full scale
11.	Response Time	120 sec or less
12.	Span check facility	Built in permeation bench
13.	Calibration	Please see multi-calibration section (Sl. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9)
14.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
15.	Digital Output	Multiple drop RS 232, USB port /TCP/IP , Ethernet
16.	Approval	USEPA and TUV approved Analyzer

### 5.2 AMBIENT OXIDES OF NITROGEN (NO-NO<sub>2</sub>-NO<sub>x</sub>) ANALYSER

01.	Principle	Chemiluminiscence
02.	Measurement	NO-NO <sub>2</sub> - NO <sub>x</sub> in Ambient Air
03.	Display	Digital
04.	Ranges	Auto ranging 0-2000 ppb
05.	Lower Detectable Limit	1 ppb
06.	Noise Level	0.5 ppb
07.	Zero Drift	< 1 ppb/24 Hrs.
08.	Span Drift	< 2% in 15 days of full scale
09.	Linearity	± 1% of full scale
10.	Response Time	120 sec or less
12.	Span Check	Built in permeation bench
13.	Calibration	Please see multi-calibration section (Sl. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).
14.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
15.	Digital Output	Multi drop RS 232 port, USB port /TCP/IP , Ethernet
16.	Approval	USEPA and TUV approved Analyzer

### 5.3 AMBIENT AMMONIA ANALYSER (NH<sub>3</sub>)

01.	Principle	Chemiluminescence (NH <sub>3</sub> conversion to NO by oxidation. NO <sub>2</sub> also converted to NO. The difference obtained by measuring NO in output of two sample stream as equal to NH <sub>3</sub> )
02.	Measurement	NH <sub>3</sub> in Ambient Air
03.	Display	Digital
04.	Ranges	Auto ranging 0-1000 ppb
05.	Lower Detectable Limit	1 ppb
06.	Noise Level	0.2% of reading
07.	Zero Drift	<5 ppb /24 Hrs.
08.	Span Drift	< 2% in 15 days of full scale
09.	NH <sub>3</sub> /NO converter	Quartz at approx. 1000 <sup>0</sup> C
10.	Linearity	± 1% of full scale
11.	Response time	180 second
12.	Rise / fall Time (95% of the final value)	< 30 Sec
13.	Span Check facility	Built in permeation bench
14.	Calibration	Please see Multi-calibration section (Sl. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).
15.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA /4 – 20 mA a Digital output
16.	Digital Output	Multi drop RS 232 port, USB port/TCP/IP, Ethernet

### 5.4 AMBIENT CARBON MONOXIDE (CO) ANALYSER

01.	Principle	Non-Dispersive Infra-Red (NDIR) with Gas Filter Correlation
02.	Measurement	CO in Ambient Air
03.	Display	Digital
04.	Ranges	Auto ranging 0 - 100 ppm.
05.	Lower Detectable Limit	0.1 ppm
06.	Noise Level	0.05 ppm with time constant ± 30 seconds
07.	Zero Drift	< 0.2 ppm/7 days
08.	Span Drift	< 1% full scale in 24 hrs.
09.	Linearity	Continuous ± 1%
10.	Response Time	30 seconds or less
11.	Calibration	Please see multi-calibration section (Sl. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).
12.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
13.	Digital Output	Multiple drop RS 232port, USB port /TCP/IP, Ethernet
14.	Approval	USEPA and TUV approved Analyzer

## 5.5 AMBIENT OZONE (O<sub>3</sub>) ANALYSER

01.	Principle	UV Photometric / Chemiluminiscence
02.	Measurement	O <sub>3</sub> in Ambient Air
03.	Display	Digital
04.	Range	Auto ranging 0 - 500 ppb
05.	Lower Detectable Limit	1.0 ppb
06.	Noise level	± 0.5 ppb
07.	Zero Drift	< ½% per month
08.	Span Drift	< 1% per month
09.	Linearity	Continuous ± 1%
10.	Response Time	30 seconds or less
11.	Calibration	With built in Zero and span generator and also see multi-calibration section (Sl. No. 7)
12.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
13.	Digital Output	Multiple drop RS 232 port, USB port /TCP/IP, Ethernet
14.	Approval	USEPA and TUV approved Analyzer

## 5.6 PM<sub>10</sub> MONITOR Conforming to USEPA Automated Federal Equivalent Method (FEM) Designation

Based on the principle of β-ray attenuation by particulate sampled through the instrument and collected on fiberglass filter tape. Before and after sampling β-ray radiation is measured by scintillation / G.M. counter. An internal microprocessor handles all sequences and automatically calculates the concentration of SPM.

01.	Principle	β- ray attenuation
02.	Particle Size Cut Off	0 - 10 Microns
03.	Measuring Range	User selectable (0 – 500, 0 – 1000 & 0 -2000 mg/m <sup>3</sup> ) with auto ranging feature
04.	Resolution	1% of the measurement range
05.	Lower Detectable Limit	2 mg/m <sup>3</sup>
06.	Detector	Plastic Scintillator / GM Counter
07.	Air Flow Rate	At least 1.5 m <sup>3</sup> / hr
08.	Filter Material	Glass Fiber Filter
09.	Display	LED / LCD
10.	Sampling Head	Dynamic heated sampling head for measurement of PM <sub>10</sub> , with adjustable temperature 20 – 70 °C
11.	Calibration	Reference membrane facility should be provided for calibration of analyzer.
12.	Compatibility	Analyzer should be compatible with protocols of DAS system to be used in station.
13.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
14.	Digital Output	Multi drop RS 232 port USB port /TCP/IP /Ethernet

15.	Roll Length	Minimum 20 meters
14.	Measurement interval	1min. to 60 minutes (user selectable) Generally measurement shall be done at a frequency of 15 minutes.
15.	Approval	USEPA and TUV approved Analyzer

### 5.7 PM<sub>2.5</sub> MONITOR Conforming to USEPA Automated Federal Equivalent Method (FEM) Designation

Based on the principle of b-ray attenuation, particulate sampled through the instrument and collected on fiberglass filter tape. Before and after, sampling  $\beta$ - ray radiation is measured by scintillation / G.M. counter. An internal microprocessor handles all sequences and automatically calculates the concentration of PM<sub>2.5</sub>.

01.	Principle	$\beta$ - ray attenuation
02.	Particle Size Cut Off	0 – 2.5 Microns
03.	Measuring Range	User selectable (0 – 500, 0 – 1000 & 0 -2000 mg/m <sup>3</sup> ) with auto ranging feature
04.	Resolution	1% of the measurement range
05.	Minimum Detectable Limit	2 mg/m <sup>3</sup>
06.	Detector	Plastic Scintillator / GM Counter
07.	Air Flow Rate	At least 1.5 m <sup>3</sup> / hr.
08.	Filter Material	Glass Fiber Filter
09.	Display	LED / LCD
10.	Sampling Head	Dynamic heated sampling head for measurement of PM <sub>2.5</sub> with adjustable temperature 20 – 70 °C
11.	Calibration	Reference membrane facility should be provided for multipoint calibration of analyzer.
12.	Compatibility	Analyzer should be compatible with protocols of DAS system to be used in station.
13.	Roll Length	Minimum 20 meters
14.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
15.	Digital Output	Multi drop RS 232 port ,USB port /TCP/IP ,Ethernet
16.	Measurement Interval	1min. to 60 minute (user selectable) Generally measurement shall be done at a frequency of 15 minutes.
17.	Approval	USEPA and TUV approved Analyzer

## **5.8 BTEX MONITOR / ANALYSER**

### **5.8.1 GENERAL**

A complete monitor / analyzer system including continuous automatic sampling (pump etc.), sampling, analyzer, detector, calibrator, computer hardware and software for instrument control, data storage, display, acquisition, processing and for selective determination of volatile compounds in ambient air optimized for Benzene, Toluene, Ethyl Benzene and o, m, p - Xylenes. Compatible to power supply (voltage 230 volts  $\pm$  10 volts AC and 50 Hz $\pm$ 3%). Continuous unattended measurement system of individual BTEX should work without cryogenic cooling. System should have protocol compatible to communicate & transfer data to main computer through modem and subsequently to CPCB/SPCB website preferably having features of security, data validation & alarms etc. Raw data storage capacity without erase minimum for three month or more. The system should be delivered with all necessary spares, consumables, tubing etc. for making it functional.

### **5.8.2 TECHNICAL SPECIFICATIONS**

#### **DETECTOR**

Photo Ionization Detector (PID) or other equivalent detector as per EPA/EU/TUV approved specs, which do not require hydrogen or other gas to operate it. The system should have auto-clean & auto calibration facilities. PID Lamp eV should be 10.6eV. PID sensitivity sensor should be available to check sensitivity.

#### **MINIMUM SPECIFICATIONS**

- The analyzer is suitable for the measurement of benzene, toluene, ortho & para xylene in ambient air.
- The analyzer should be compact, with a height of 3HU minimum, which fits in a 19" rack. The analyzer should be supplied with simple software and work via the principle of a standard Gas Chromatography.
- The analyzer should be suitable for small containers like tunnel cabins or kerb side stations.
- The supplier must have ISO 9001 Quality certification ensuring all design and manufacturing processes meet international quality standards.

#### **Measurement Principle:**

- The analyzer should be based on Gas Chromatography with PID detector. This compact analyzer should be supplied with all the essential elements: preconcentration sampling unit, back flush valve, separation column in special small oven unit and detector. The detector should be a PID.
- The gas sample is to be concentrated in a TRAP. The sample should be then desorbed and injected over the valve into a column and benzene passes on to the detector. The system

should be optimized for ambient benzene concentrations.

- All higher boiling hydrocarbons should be BACKFLUSHED to provide the two advantages to the system: auto cleaning every cycle and a very short cycle (for benzene standard minimum 10 minutes). The system should be adapted to the specific hydrocarbon that must be monitored with regard to the essential parameters: column, flow, temperature and back flush setting. The OVEN should be isothermal.

The analyzer should have a minimum of the following technical specifications.

Sl. No.	Description	Requirement
1.	Principal	Based on gas Chromatographic separation and Photo Ionization Detector (PID)
2.	Measurement	Benzene, Toluene, Ethyl-benzene, m,p-Xylene and O-Xylene.
3.	Display	Digital
4.	Range	0 - 100 ppb (0.32 – 325mg/m <sup>3</sup> )
5.	Lower detectable limit	0.2 ppb (0.65mg/m <sup>3</sup> ) for 15 min cycle for Benzene
6.	Temperature Range	5 - 35°C or more
7.	Repeatability	Retention Time: <0.1% RSD Concentration: <1.0% RSD
8.	Typical Cycle Time	Total Cycle Time should not exceed 15min i.e. Sample Collection Time -15 min approx. Analytical Time- 15 min approx.
9.	Sample Volume	1 liter for 15 min cycle.
10.	Desorption tube	Carbotrap
11.	Pre concentration	Carbopack
12.	Span Check	Built in permeation bench with NIST certified Benzene& Toluene permeation tube.
13.	Calibration	The Analyzer should be capable to calibrate through Multi Calibration System also. Please see multi-calibration section (Sl. No. 7) And also calibration section in General Specifications (4.1.7 & 4.1.9).
14.	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 Ma
15.	Digital Output	Multi drop RS 232 port, USB port /TCP/IP, Ethernet
<b>HARDWARE AND COMMUNICATION OPTIONS</b>		

16.	INCLUDED HARDWARE	Computer Pen-um class, hard disk >20Gb, 6" full colour LCD
17.	INCLUDED SOFTWARE	Windows Xp or further version, Embedded, GC Software
18.	COMMUNICATION	Direct control via touchscreen, keyboard or mouse. External data communication via RS232, analog and digital outputs, via TCP-IP.
19.	GC SPECIFICATIONS	Column cage with special application column, 10 port valve, Pre-concentration trap, detector PID
20.	CALIBRATION	Internal calibration switch for calibration zero and span gas, gas stream required 25 mL at ambient pressure
<b>PHYSICAL DATA</b>		
21.	DIMENSIONS	19" rack, (W 48,3 cm) 3 standard Height Units, (high 13,9 cm ) depth 37,2 cm Approx. Weight 12 kg
22.	POWER	220 V AC
23.	CONDITIONS	5 TO 40°C, 20 TO 95% Rh
24.	APPROVALS	CE approval for EMC conformity: QAL1 certificate EN 61000-6-2, EN 61000-6-3, EN 61010, EN 61326
25.	EXTRA FUNCTION	Combination with stream selector possible: Stream selector type VICI dead end or flow through, 6 to 16 streams, pump 5 L/min (internal) or on demand external. Combination with RS232 alarm out puts 4-20mA up to 15 streams.

## 5.9 MULTICALIBRATION SYSTEM

Calibration system shall be of same make as that of gaseous analyzers and should provide for the calibration of the air quality analyzers, data acquisition system, meteorological equipment, and gas calibration system.

Each monitoring system must be fitted with a Gas Dilution Calibrator to perform precise gas dilution calibrations, ozone analyzer precision checks and gas phase titrations.

Each air monitoring system requires an automatic gas dilution calibrator, calibration gas standards and a high performance zero air generator to calibrate all of the gas analyzers in the system. The Data Acquisition System must be capable of automatically controlling calibration cycles at any specific time during the day or night.

The dilution calibrator must enable the mixing of source gas, from a calibration gas cylinder, with

zero air, from the zero-air generator, in order to generate a wide range of calibration gas concentrations.

This will allow multipoint calibrations to be performed on the various analyzers while minimizing the number of calibration gas standards required.

A single gas bottle will be used to hold a mixture of calibration gases, specifically CO, NO and SO<sub>2</sub> in Nitrogen. The dilution calibrator should have Ozone photometer to perform ozone calibrations of the ozone analyzers in the network.

Only two of these are required for the network. It must be possible to connect the dilution calibrator with up to 4 external gas cylinders for precise dilution of these gas standards with dilution air in order to generate a wide range of user configurable gas concentrations sequence.

The dilution calibrator must:

- Perform single and multipoint calibrations using precision mass flow controllers
- Perform gas phase titrations (USEPA Method) and ozone precision checks achieved using its internal ozone generator.
- Enable setup via front panel display and keypad or a computer.
- Must have Ozone photometer to calibrate O<sub>3</sub> analyser.
- Must have RS232 interfacing with the data acquisition system and enable full remote control as well as remote setup and configuration.
- Gas Dilution Calibrator must have a digital interface with the Zero Air Generator and be able to turn the Zero Air Generator on and off when a dilution is required.
- Must have a purge function allows flushing of gas lines.

a) **Gas Calibration System:**

The calibration system for air monitoring equipment (listed above) should incorporate an automatic gas dilution calibrator, calibration gas standards and a high performance zero air generator (from the same make of gas analyzer) to calibrate all of the analyzers in the system.

The calibration cycles should be able to be configured through the Data Acquisition System at any specific time during the day and night. It should be mounted on standard 19" rack.

The dilution calibrator should be able to perform mixing of source gas, from the calibration gas bottles, with zero air generators, in order to generate a wide range of calibration gas concentrations and minimizing the number of calibration gas standards required. All the calibration gases provided along-with the system MUST be NIST Traceable (certificate should be provided). It should also have facility for Gas Phase titration (GPT), having Ozone generator of 6 PPM / Liters and the converter efficiency should be 100 % for conversion of NO<sub>2</sub> concentration to NO. The system should also include calibration of Ozone analyzer.

<b>SPECIFICATIONS</b>	
<b>Dilution Gas Inputs</b>	1 standard 100 - 200 kPa (g) (2 optional)
<b>Source Gas Inputs</b>	4 standard 100 - 200 kPa (g) (8 optional)
<b>Dilution Mass Flow Controller</b>	10 SLPM, 0 Deg, 1 ATM (std), 1 SLPM, 2 SLPM, 5 SLPM or 20 SLPM (optional), 2nd MFC (optional)
<b>Source Mass Flow Controller</b>	50 SCCM, 0 Deg, 1 ATM (std), 10 SCCM, 20 SCCM, 100 SCCM, 500 SCCM or 1 SLPM, 2 SLPM (optional), 2nd MFC (optional)
<b>Flow Accuracy (Constant Temp)</b>	Within 1 % of full scale
<b>Flow Repeatability</b>	Within 0.15 % of full scale
<b>Linearity</b>	Within 0.15 % of full scale
<b>Operating Gas Pressure</b>	100 - 200 kPa
<b>Zero Drift</b>	< 0.6 % per year
<b>Response Time</b>	< 5 seconds
<b>Output Manifold</b>	4 output ports standard
<b>Dilution Ratio</b>	Variable 10:1 to 2000:1 (std configuration)
<b>CASE DIMESIONS</b>	
<b>Rack length</b>	597 mm (23.5") (front to rear)
<b>Rack Mount</b>	19"
<b>Total length (with latch release)</b>	638 mm (25.1")
<b>Chassis width</b>	418 mm (16.5")
<b>Front panel width</b>	429 mm (16.9")
<b>Chassis height</b>	163 mm / uses 4RU (6.4")
<b>Front panel height</b>	175 mm (6.9")
<b>Weight</b>	18.2 kg
<b>POWER</b>	
<b>Operating Voltage</b>	• 100 - 240 V VAC 50 / 60 Hz (autoranging)
<b>Power Consumption</b>	• 165 VA maximum (typical at start-up) 95 VA afterwarm-up
<b>Operating Conditions Ambient Temperature Range</b>	• 0 - 45°C (32 - 104°F), 20 - 35 °C for optimum performance
<b>Pressure</b>	• Maximum altitude: 3000 m above sea level
<b>COMMUNICATION</b>	
<b>User Interface</b>	• Via front panel keypad or computer
<b>Programmable calibrations</b>	• 16 separate programmable sequences
	• 32 separate programmable points Analog Input
<b>Analog Input</b>	• Three analog voltage inputs (0 - 5 VDC) CAT I rated
<b>Digital Output</b>	• RS232 port #1: Normal digital communication

	<ul style="list-style-type: none"> <li>•RS232 port #2: Multidrop port used for multiple analyser connections on a single RS232</li> </ul>
	<ul style="list-style-type: none"> <li>•USB port connection on rear panel, Non-volatile protected, automatic start-up after power failure</li> <li>•25 pin connector with discrete status and user control</li> <li>•USB stick memory (front panel) for data logging, event logging and parameter storage</li> <li>•8 Digital Outputs, open collector max 400 mA each at 12 VDC (max total output 2A)</li> <li>•8 Digital Inputs, 0 - 5 VDC</li> <li>•CAT I rated</li> <li>•1 Diluent Control, + 12 V output</li> <li>•Four line illuminated display</li> </ul>

<b>OZONE GENERATOR</b>	
<b>Output Concentration</b>	• 3 ppb to 5000 ppb
<b>Flow Rate</b>	• Variable dependent on Dilution Mass Flow Controller installed
<b>Repeatability</b>	• < 1 % short term (24 hours) 5 % long term at constant temperature and humidity

#### b) Zero Air Generator System

The system should include a compressed air source, permeation dryer and a series of scrubbers, producing clean, dry dilution quality 'zero air.'

The Zero Air generation system must be of the same make as the Gas Analyzers & Gas dilution calibrator.

The system should include an external Logic Control connection to activate the air source when air is required by the calibrator.

The system should be a 19" rack-mounted enclosure. Capable to provide in excess of 10 slpm of zero air. The system should include Heated CO Scrubber to remove CO to less than 0.1 ppm and the addition of a Hopcalite scrubber so that the high purity zero air will be available for CO analyzer for its background use.

#### **SPECIFICATIONS**

Zero air flow:	0-10 l/min
Protection:	Pump is thermally protected
Zero air pressure:	100-200 kPa
Dew Point	- 15 °C
Power:	220 VAC 50Hz

Air scrubbers:	Air Clean-Up Canister for removal of: NO <sub>x</sub> , NO, NO <sub>2</sub> , O <sub>3</sub> , SO <sub>2</sub> , H <sub>2</sub> S,  Less < 0.1 PPB
Size:	height: 230mmH (5RU) with rubber feetwidth: 482mm depth: 352mm

c) **Calibration Gas Cylinder:**

The supplier has to supply the calibration gas cylinder (highly polished aluminium 10 liters water capacity), along with SS Regulator, traceable to NIST for each components (SO<sub>2</sub>, NO, CO, NH<sub>3</sub>, Benzene & Toluene) along with SS regulator for the multipoint calibration. The synthetic air and N<sub>2</sub> cylinder (99.99% purity with certificate) should be in Carbon Steel cylinder of 47 Liters water capacity along with SS Regulator.

All cylinders must be delivered with certificate indicating concentration and uncertainties.

d) **Meteorological, Flow and Electronics Calibration**

The supplier should provide calibration devices or calibration check devices for all the meteorological and other electrical equipment mentioned above as per the specifications of the manufacturers.

**Recommended Spare Parts and accessories required for the next three years for normal operation should be supplied along-with the calibration system.**

## 5.10 METEOROLOGICAL MONITORING SYSTEM

The meteorological instrumentation should be interfaced directly with the Data Acquisition System after passing through a lightning protection isolation box. A crank - up telescopic 10 meters tower should be erected for mounting of meteorological sensors. The relative humidity and solar radiation sensors should be mounted on the tower. All sensors should be NIST (National Institute for Standards and Technology, USA) traceable. The specifications are follows:

(a) **WIND SPEED**

Range (Operation)	0 – 60 m/s or better
Sustainability	Up to 75 m/sec
Accuracy	± 0.5 m/sec or better
Resolution	0.1 m/sec
Sensor Type	Ultrasonic
Threshold	0.5 m/sec or less
Response time	9 sec or better

**(b) WIND DIRECTION**

Range	:	0 – 359 degree
Accuracy	:	± 3 degree or better
Resolution	:	1 degree
Sensor type	:	Ultrasonic
Threshold	:	0.5 m/sec or less
Response time	:	9 sec or better

**(c) AMBIENT TEMPERATURE**

Range	:	-10 ° C to 60 ° C
Accuracy	:	± 0.2 ° C or better (with radiation shield)
Response	:	10 seconds in still air
Resolution	:	0.1 ° C
Sensor type	:	Resistance type
Response time	:	10 sec or better

**(d) RELATIVE HUMIDITY**

Range	:	0 to 100% RH
Accuracy	:	± 3.0 % or better
Resolution	:	1%
Sensor type	:	Capacitive / Solid State
Response Time	:	10 sec or better

**(e) SOLAR RADIATION**

Range	:	0 to 1500 W/m <sup>2</sup> or better
Accuracy	:	± 5.0 % or better
Resolution	:	5W/m <sup>2</sup>
Sensor type	:	Silicon Photo diode

**(f) RAINFALL**

Range	:	0.2 mm to 100 mm /hr
Accuracy	:	± 5% or better
Resolution	:	0.2 mm
Sensor type	:	Tipping bucket rain gauge or any other suitable sensor
Response Time	:	10 sec or better

### **(g) TELESCOPIC CRANK – UP METEOROLOGICAL TOWER**

The wind speed, wind direction, temperature, relative humidity and solar radiation sensors are to be mounted on the Meteorological Tower. The tower is to be a free standing four section telescopic tower provided with a hand crank to raise and lower the instruments mounted on the tower. Specifications are as follows:

Extended Height	: 10 meters
Retracted Height	: 2 metres
Wind load Limit	: 0.7896 sq. m. (8.5 sq. ffft) at 50 mph
Number of Sections	: 4
Construction material:	Galvanised steel or aluminium

Note: Humidity and temperature sensors are to be supplied with weather and thermal radiation shield made of anodized aluminium and sensor should be supplied with all necessary cables, connector and mounting arrangements as required.

### **(h) SPECIFICATIONS OF DATA LOGGER:**

Data logger with 8 analog, 24 digital inputs and 18 bit resolution. Ability to log channels at different intervals and should have capability of averaging and displaying real time data and averaged data over a period of 1 min, 15 min, ½ hr, 1 hr, 4 hrs, 8 hrs, 24 hrs, 1 month and year. Communication between data logger and computer using standard multi drop RS 232port / USB Port/ TCP/IP/ Ethernet Connector. The data logger should have internal battery with charger. The data logger should support PSTN line or Internal GSM modem for data transfer.

## **6.0 A DATA ACQUISITION SYSTEM IN THE STATION SPECIFICATIONS OF STATION SOFTWARE:**

The station software captures data from all channels in the system and stores in the Personal Computer. Personal computer is used for calibration and configuration of each channel.

### **1. Data Acquisition**

- a) Frequency of data acquisition
  - i) User selectable 1, 5, 30, 60, 120 second averaging duration online digitally.
- b) Channel size
  - i) 32 Channels or more supported
  - ii) Expandable to 64 channels, if required in future
- c) Data input
  - i) Either Analog (0-1 volt / 0-10 volt / 2-20mA / 4-20mA)
  - ii) Or Digital (firm will develop the protocol, if required without additional cost within project duration) to configure with the PC.
- d) User configurable channels, stations and equipment's with communication parameters.
- e) Analyzer data channel should comprise of Name, Units, Communication Address, Validity Range, Operation and Error Status.
- f) Provision to incorporate conversion factors such as PPB to µg/m<sup>3</sup> etc.

- g) Software should be equipped to configure the analyzers with it, irrespective of the output mode i.e. Analog or Digital (RS 232) of the instrument.
- h) System should read raw data values of the analyzers and meteorological instruments and duration of averaging data should be user selectable like 10 /20 / 30 / 40 / 50 / 60seconds.
- i) The output should be converted into realistic data in prescribed units.

## **2. Data Collection**

- a) Software should collect each second data.
- b) Average data over user selectable time (1, 5, 30, 60 seconds time interval) period.
- c) Operational status, Error status, calibration status and calibration values observed from the analyzer should be captured and should be made available along with the data with a frequency of maximum five minutes.
- d) System should collect of the diagnostics of the instrument comprising actual diagnostics parameters and their values at least once in every five minute to check the state of the health analyzer.
- e) Calibration parameters
  - i) Provision to entering calibration, span calibration values of Gas cylinder to devices
  - ii) Provision for collecting zero calibration, span calibration values (pre calibration & post calibration) in to the database for further analysis.
  - iii) Provisions to collect electronic system pre calibration & post calibration to ascertain the percentage deviation/ correction apply during each calibration.

## **3. Data Storage**

- a) Data along-with diagnostic, calibration, alarms should be stored at station computer at a defined path.
- b) Interval of data dumping will be same as defined in the data collection.
- c) System should be capable to keep every second acquired data from 32channels for a period of minimum five years.
- d) Current data should be stored as per ISO-7168-1:1999I format and should be available in folder named as c:\Data\ at an interval of 15 minutes. As an example c:\data\01.05.2015.xml. the file will be appending without double data entry and as per ISO format.
- e) Data should also be stored for last two years in E:\data\Year\Month\day i.e. e:\data\2015\05\01.05.2015.xml ....
- f) No data encryption should be done at the station and if encryption is done than decryption procedure should be made available in soft file format to check the data at station at any point of time. To convert data on continuous basis for exporting to any other software, if required, procedure should be available without any licensing.

## **4. Data Display (Statistical analysis of data)**

- a) Main window for real time display of all measured parameters with status of all analyzers/sensors.
- b) In 4-in-4 graphs and 4-in-1 graph formats
- c) In tables of 4-in-1 format
- d) Real time multi – graphs over user selectable time period i.e. 6.00 AM to 6.00AM etc.
- e) Display of graphic & tabular display of the current data.
- f) Graphical form should comprise of 4-4 graphs, 4-1 graphs in user defined format (1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly; user definable time series)
- g) Tabular form should comprise of 4 channel list in user defined format (1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly; user definable time series)

- h) Station instruments basic configuration etc. should be visible on screen continuously.
- i) Statistical analysis tools like regression analysis, co-relation analysis and other analysis as per industry standards in the field of environment should be available and if not the firm should develop these for CPCB within a time frame of six months.
- j) The system should have procedures for normal analysis tools like calculation of data with respect to a threshold value, average, minimum, maximum, calculation of violating value with respect defined values (National Air Quality Standards) for defined period for the database etc.
- k) Data analysis of diagnostics parameters l) Data analysis of Pre calibration and post calibration data (if facility not available, should be developed within six months) m) Data analysis of corrections applied of each calibration cycle (if facility not available should be developed within six months)

#### **5. Data Backup**

- a) There should be defined data backup procedure through which data can be Extracted from station computer in simple text format / excel (user Definable).
- b) There should be defined restore procedure also to restore the data in case of data loss.
- c) A display screen should be available to update the user about data availability.

#### **6. Data Validation automatic checks at station software**

- a) Zero level and span level checks if performed cyclically and defined results are not obtained up to +/- 5% (user definable 0-10%) then system should alarm the user of system failure and the recorded alarm should be transmitted to central software.
- b) After instruments perform the calibration, the results obtained should be recorded and should be transmitted to central computer.

#### **7. Data validation requests generated at station computer**

At least three tier request generation and request acceptance system procedure is desired. Details are given in the Annexure -I.

- a) Inbuilt checks capability may be provided, where if instrument throws erratic data software can check automatically and display message and send information in the form of corrected data in corrected database to be approved by the central software at central level. (facility if not available needs to be developed by the system provider)
- b) There should be provision of two databases one is raw database and another corrected database. (facility if not available needs to be developed by the system provider)
- c) Validation of data through calibration database Pre calibration & post calibration values collected.

#### **8. Calibration of systems**

- a) Calibration window for analyzer for the calibration from computer.
- b) Remote Access to Calibration: Calibration exercise need to be done remotely. All necessary arrangements for it should be made in the system.
- c) Calibration data file may be prepared separately.
- d) Calibration database need to be formed, stored and transmitted to central.
- e) Calibration cycles to be as per the models of the instruments.
- f) Calibration records should store the calibration values displayed by instrument.
- g) Diagnostics during calibration should also be recorded.

#### **9. Location of station**

- a) Fixed Station location to be recorded
- b) Moving station location to be recorded
- c) Latitude and longitude of Vans be recorded

#### **10. Data transfer to Central**

All data captured at station computer should be transferred to central software.

- a) User selectable time frame for transmission of data to central server.
- b) Diagnostics (actual diagnostics parameter values recorded each time in the station), configurations (station channel configurations), alarms (generated alarms) should be transmitted.

## **7.0 DATA ACQUISITION SOFTWARE AT THE CENTRAL STATION AT EACH SPCB& CPCB**

Data communication system handles the data transmission of an ambient air quality network and receives incoming messages / signals from remotely stationed Vans.

The central software processes signals and data and displays it on the web and other interfaces. Detailed requirement is as below: supply, installation and commissioning and Operation & maintenance services of Mobile Continuous Ambient Air Quality Monitoring Van (MCAAQMV)

### **1. Software at Central Station**

- a) Software should not have any restriction on number of locations and computers either technologically or in terms of licensing.
- b) Should display multiple stationed Vans on - line data (momentary values) in tabular text and graphic format.
- c) Data should be received by the central from all locations within 5 minutes duration or at user defined time intervals.
- d) Data along-with diagnostics and calibration details should be transmitted at central from all connected locations.
- e) Should support dialup systems, broadband connectivity, wireless connectivity, 2G or 3G or any new technology which shall be in place during project time should be compatible and if not need to developed by the system Provider up-to project duration without additional charges.
- f) Should have the remote-control facilities for calibrations (Zero & Span) of instruments and measuring range modifications.
- g) Should have facility for displaying data communication error reports, image management which should be recorded and should be available for display.

### **2. Data Display at Central**

- a) In 4-in-4 graphs, 4-in-1 graph and/or 16-in-1 graph formats In terms of 4-in-1 table format Real time multi - graphs over user selectable time period.
- b) Display of graphic & tabular display of the current data like simple 3D line and column chart, polar diagnostics and 3D perspective column chart. Graphical form should comprise of 4-4 graphs, 4-1 graphs in user defined format i.e. 1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly. (user definable time series) Tabular form should comprise of 4 channel list in user defined format i.e. 1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly. (user definable time series)
- c) Display of data using selectable name of different Vans. Generation of Wind Roses, Pollution Roses (12 & 16 directional i.e. 0degree, 22.5, 45, 67.5, 90 and 360 degree) with user defined time limits. Calculate vector mean of wind direction.
- d) Programmable down loading of data. Comparison of data w.r.t. Standards in Graphical form and tabular form within formation of values exceeds the Standards. 1) Specific data zooming facility
- e) Database correction procedure Separate user ID and Password for correction of database so that all regional level users if authorized can validate their regions data and the events be recorded

along with ID and time.

f) Data validation trail recording.

### 3. **Data Export**

Customizable data format developing capability required. Possibility to export the data files in Excel, Text and other formats Tabular form should be in user defined format i.e. 1, 5, 10, 15, 30 min, 1 hour, 4, 8, 24 hour, 30 days and yearly.

### 4. **Data Import**

In case of communication medium phase there should a mechanism to shift the data into Pen drive (Physical medium for data collection) physically and a procedure to import the same on central software.

### 5. **Printing**

Possibility to connect different types of printers and auto printing facility for all displays generated throughout the analysis of data at any point of time.

### 6. **Data Validation automatic checks at Central software at SPCB**

- a) Zero level and span level checks if performed cyclically and defined results are not obtained up to +/- 5% (user definable 0-10%) then system should generate alarm the user of system failure and the recorded alarm should be transmitted to central software and stored.
- b) There should be provisions to read these alarms in a database for corrective actions and for comparison of data for acceptability or rejection. After instruments perform the calibration, the results obtained should be recorded and should be transmitted to central computer and stored.
- c) There should be provisions to configure at least 08 alarms for any given instrument auto check. Data validation requests management at central computer (if not available facility maybe developed by the firm) Data validation requests sent by station computer should be recorded and the system should provide a window to user to accept or reject the reasons mentioned by the user end.
- d) Inbuilt checks capability should be provided, which can be configured by the administrator at central to put alarms according to requirement on data, errors generated or on diagnostics of systems.
- e) The software at central should have facility to log in data validation requests. These requests will carry the erroneous data for user selected period and for which user at station will request to change the data due to environmental or instrumental operation conditions.
- f) These requests will reside in central location and whenever user at central agrees the data will be changed in the validated database. Hence, system will have two types of databases
  - 1) Raw database which can never be touched
  - 2) which has to be modified and corrected as per agreed conditions.

The detail of user requesting or applying changes in corrected database should be recorded with time.

### **Data Display at Web (if not available facility may be developed by the firm)**

- a) System should have standard web display software in place.
- b) Central software should be capable to show the data in predefined formats at website on a physical map.
- c) The data from Corrected database shall be displayed on the web.
- d) Current data should be displayed on web page.
- e) There should be provisions to show no. of violations occurred, percentage of violation occurred at stationed Vans parameters comparing hourly, 8hourly, 24 hourly and yearly standards

- f) Provision is required to change standard value, since standard values do change after certain period of time as per Govt. policy.
- g) Displayed web page should have facility of providing information to all with respect to environment as well as to provide specific files for downloading.
- h) The logo of GPCB should be displayed on webpage.
- i) The disclaimer has to be provided on the webpage
- j) Some predefined queries have to be developed to display the data on webpage. A search page needs to be developed for converting data into meaningful format for the general public.
- k) The current data displayed on the web should have comment inserting facility at individual data and for running data as well like if any station instrument out of order, then station official should be able to display message “Instrument under maintenance”.
- l) Similarly, when data goes beyond a defined limit it should automatically display a predefined message as comment on webpage as “Data under Scrutiny”.
- m) Automatic e-mail messages to be generated for the identified end users to start a corrective action.
- n) Station photos to be uploaded for the display along-with the data.
- o) User defined 05 pages may be developed additionally, if required by GPCB designs for which may be decided mutually.

**7. Data display at display board outside the office at central location also**

Data display is also required at regional and central locations for which software provision has to be made at each location.

- (a) At SPCB Offices: A display board will have to be supplied & installed by the supplier at each SPCB Office for which space to be provided by CPCB/SPCB/PCC etc.
- (b) CPCB/SPCB intends to show the content:
  - i. Information from External Sources
  - ii. Information drawn from Internal databases
  - iii. Advertisement in the form of Text, Slides, Charts, Videos etc.
  - iv. Live Feeds

**(g) Content Management System**

Content Management for Data Display Boards is to be managed both locally & centrally. Hence, the supplier is requested to provide software for local (at CAAQMS) & Central content management (at CPCB & SPCB). The central software should be capable to operate simultaneously at SPCB and CPCB. There could be two different software’s at SPCB & CPCB to manage contents of display boards of CAAQM Station & SPCB Office

Therefore, Display Board Data Transmission Device (DBDTD) should be capable to collect the content from local station, SPCB Central Software and CPCB Central Software manually through scheduling procedure for different durations (Minutes, Hours, Days, Weeks, Months, Years etc.), zone-wise, state- wise, group-wise, device wise, content-wise separately as there will be of different contents to be displayed at different locations. The central software should have the capability of Remote machine status monitoring& management. It should be capable to provide on-screen display of remote display board (live screen of display board).

Establishing the required connectivity by using necessary devices (either through LAN, Wi-Fi, GSM etc.) between the DBDTD and CPCB & SPCB to run the content seamlessly is within the scope of the supplier.

## 8. Remote Procedures (if not available facility may be developed by the firm)

- a) Central software should have capability to allow to connect any station instrument through remote.
- b) Central software administrator should be able to go for remote calibration of any of the systems.
- c) Software should be capable to operate remotely stationed Vans configurations.
- d) Control panel window should be available for controlling each analyzer.
- e) Alarm window for valid alarms of all analysers and sensors.
- f) It should have transparent data - connection to each analyzer from remote.
- g) System should be capable to remotely configure all stationed Vans through remote location using configuration file to maintain the uniformity. The configuration command from central or from regional location should be active.

## 9. Data Reports Generation

- a) To prepare reports hourly, weekly, monthly, yearly in user defined interval and formats.
- b) Mean, Median, Percentile, Maximum, Standard deviation, Frequency analysis and Maximum Frequency analysis.
- c) System should have predefined user selectable procedures through which reports of any specific or stationed Van reports up to four parameter scan be generated as per user selected time frame.
- d) Data Comparison Software should be able to compare any of the four channels irrespective of type of data in the system with respect to each other on a single time scale user selectable.
- e) Data Comparison on different time scale Software should be able to compare data on the basis of different time scales like one station (x) parameter (y) of one given date is compared with other station (z) parameter (y) on any other date in a single graph.
- f) Data reports, calibration reports and status reports with user time periods.
- g) Historic multi - curves / graphs over user selectable time period.
- h) Report generation over user selectable time period (instantaneous or averaged over a period of 1, 15, 30 min, 1 hr, 4, 8, 12, 16 and 24 hrs etc.).
- i) Diurnal variation, standard deviation, regression and other statistical parameter reporting possibilities with various available mathematical methods.
- j) If required separate report generation procedures have to be developed for which firm will be responsible for project duration.
- k) Daily report from each station should be generated and sent through email for hourly data of each parameter (including meteorological parameters, diagnostics of instruments and calibration of instruments if performed during that day) automatically format for which can be mutually agreed upon.
- l) Data should be downloadable in Excel Sheet, CSV format through user selection.
- m) Provision should be there to use raw as well as validated data for generation of all types of graphics including wind roses and pollution roses.

## 10. Compatibility

Should have compatibility with the latest Operating System with a contract of 05(five) years from the date of Supply of software for providing assistance to operate system at GPCB and all the new patches developed for the software during these 05 years without additional cost. Software should have capability of data transmission with the presently available PROTOCOL.

## 11. Security

- a. System should have the facility to have it Password protected or without password as decided by GPCB at the time of implementation.
- b. System software should be totally secured and any antivirus software required to run the system for the complete project duration has to be managed by the system provider.

## 12. Other Technical Conditions

1. Hardware required for data transmission has to be made available by the firm and there should not be non-compatibility.
2. Firm should have the capability to develop the Software PROTOCOL for data transmission from any system available in the field in future during next 05 years or up-to the project period.
3. Should support the latest formats of Windows 32 bit or 64 bit or any other available platform like Linux etc.
4. Manual of complete system should be provided.
5. Firm should provide the hardware required for data acquisition along with all the software's required like OS, MS. Office, Networking software, Remote functionality software, Data uploading software on website, Data display software if required, and should maintain hardware for project duration.
6. All softwares like OS, Data Acquisition Software, Remote Calibration Software, Content Management Software etc. used for the entire project, should be either open source or with license. Copy of licenses should be provided to SPCB/CPCB.
7. If required, system to be placed in NIC domain for which the web software developed along-with the database and web server software should be certified by CERT-IN empaneled vendors for vulnerability. The system provider is responsible for fulfilling all criteria required to place the system at NIC domain. The firm will be responsible for entire duration of the project for any vulnerability if noticed by NIC.

## 13. DETAILS OF DESIRED DATA VALIDATION SYSTEM

At least three tier request generation and requests acceptance procedure are desired in the system. It is presumed that level 1 is station, level 2 is Central location at regional level and level 3 at Central level.

The regional and central levels will have central station computers and software installed and stationed Vans will have station computer installed with station data acquisition software and data transmission software.

The flow of data has to be from stationed Vans to Regional Level and then to Central level. It is desired that environmental database has to be corrected for instrumentation issues as well as for the environmental issues. Hence, officials available at stations will communicate with central and state levels through system itself by commenting on the data.

The respective data can be picked up from the database at stationed Vans itself, corrected to the desired numbers and then transmitted to regional level central computer where, the administrator of system if agrees to the changes desired then data flows to the next level else request rejected. If request will come to Central server for accepting or rejecting then central level should have authority of accepting or rejecting the data.

If central level agrees to the changes than data should be changed in the corrected database else request should be rejected. Hence, there should be provisions for accepting or rejecting data at all three levels accordingly. Here, whenever such requests are generated, concerned administrators need to be sent email alerts.

### **List of protocols for which CAAQM software should support**

Bayern-Hessen	Intercomp5	FH62 Konf.	ChemPro 100
Intercomp 6	Intercomp 1	PVM100	MultiPD II
LabCom	Metek USA-1	VC820	X am 7000
Unor, Oxor	AK R+P	TSI 30222/25	HG Monitor 3000
Defor	MBF	Blendmaster	ESM FH40G
Multor	Gemi	Klimet	Travelpilot DX-V
Adam Module	Uras 14 Modbus	Thygan	AK Conf.
CLD700	Binos1000	USA Turbulence	Thermo Instr.
FH62	HP34970A	Thies DL14/15	PR820R
Hygrowin	Almemo	Innova1312	PAC3
Gesytec II	Modbus	Multiwarn II	Data Collect SDR
RFM433 NMEA18 3	DGH Module BH/Timo 9600	MeteoBus Windobserve r	VDO Navigation

**a. DISPLAY BOARD DATA TRANSMISSION DEVICE**

Sl. No.	Item Desc.	Specifications
1.	PROCESSOR	Intel® Atom™ Processor E3815 (1.46 GHz Single Core, 512 KB Cache, 5W TDP) or equivalent Or 900 MHz or higher <u>quad-core ARM Cortex-A7</u>
2.	Memory	Memory slots for MicroSD or full size SD card slot with Memory support for at-least 8 GB
3.	Ports	One HDMI LAN Port for Ethernet Network Connection Minimum of 3 USB Port with support for USB 2.0 or USB 3.0.
4.	OS Support	Linux, or Windows OS
5.	Communication Options	LAN Communication Wifi Communication – Wifi Hotspot enabled/GPRS Comm. Enabled
6.	Power Supply	5 to 12 V DC through 220 V 50Hz AC Supply adapter or USB driven.
7.	Size	Mechanical Chassis Size not to exceed 9’’ x 6’’x 6’’ with standalone tower/box.
8.	Operating Environment	Operating Temperature 0° C to +50° C Humidity upto 90%
9.	Device Support	05 Years
10.	Antivirus	It should be secured. If Windows than life time antivirus should be there.
11.	General	Supplier will configure and deploy the communication mechanism. Complete manual of the device should be provided.
12.	Accessories	01 Meter HDMI Cable
13.	Internet	To be provided by the vendor either through GSM SIM or through Wifi Enabled Dongles.

14.	Display Board should show	Last data saved.
15.	Display board should show	Last updated time should be displayed
16.	Software	The vendor is responsible to provide software which can download the data from Station computer, AQI, Advertisements etc. store it and display on the Display Board seamlessly.

**b. DAY LIGHT & NIGHT VISIBLE DATA DISPLAY SYSTEM LOCATION NEAR TO CAAQM STATION**

1.	Size of Display System (H X W) feet and Pixel	4 X 7 feet, 16 mm (+/- 0.5 mm) pixel pitch, 3500 m2 minimum pixel Density
2.	Visibility Range	50 Meters (Day time)
3.	Brightness	8500 NIT or higher
4.	Display of Colour Elements	1Red, 1Green, 1Blue pixel
5.	Minimum Life span of the system	LED Life 100000 Hours
6.	Viewing angle	Viewing angle of 140o Horizontal/77o Vertical
7.	Operating and Non-Operating Temperature	-15-550 C
8.	No of Color	281 trillion Colors, 256 brightness level dimming capability
9.	Video processing	24-bit Video processing, 100 % Digital
10.	Diode Density	1100m2 / 1000 ft2 (minimum)
11.	Scan rate and refresh frequency	Scan Ratio 1:1 and with minimum 20000 hz refresh frequency
12.	LED internal and External Cabinet type, Serviceability	Internal LED frame should be made of Aluminum and External cabinet should be factory made without pin holes, LED Display should be serviceable from front and back
13.	Color Temperature - Adjustable	4500 - 9000 K range
14.	Input Power Requirement/ Consumption	120/240v, 50/60 Hz, Power consumption 200 W (maximum) / m2
15.	Type	Discrete Diode
16.	Display Mounting	Structure based upon location. Uni Pole or hanging
17.	General	The system should also have the facility to display the environmental picture through video camera/vcr/cd player etc. for public awareness.
18.	Power Cable Laying	Depending upon location, cabling is to be done by the firm
19.	Device at station to pick up data and transmit it to LED	Display data connectivity device with GSM SIM has to be installed nearby LED board which will pick up data from station computer through Internet. LED to be placed away from through Internet. LED to be placed away from the station premises.

20.	Certification	CE, UL/ULC listed
21.	IP Rating	Display Module IP67, Cabinet IP 65

14. Checklist to compare Firm's Technical capability table for specifications of Software

S. No.	Details	Capability of firm's software as on date	Firm agree or disagree to develop software in future	If firm agrees to develop application then time frame from individual activity
1.	Data transfer interval Max 5 minutes from all locations?			
2.	System will transmit data along with diagnostics. If yes then how many channels diagnostics values shall be transmitted to central and at what duration?			
3.	System will transmit data along with Calibration values (Pre Cal and Post Cal)?			
4.	System has remote calibration procedures in place for regional level and central level both?			
5.	System has remote configuration facility for regional and central level both?			
6.	System has database Validation procedure in place?			
7.	Web software already developed or not?			
8.	If Web software is available, is it modifiable as per CPCB need by the firm?			
9.	Whether agree to develop five webpages as per mutual discussion			
10.	Web software with password and or without password			
11.	Password providing facility available at regional levels			

12.	Statistical tools available at web software or not?			
13.	System provider is capable of placing system in NIC domain			
14.	System provider will provide certification from CERT-IN empaneled firms			
15.	Data import from other files			
16.	Data export to other files			
17.	Pre-defined queries to be inbuilt for providing data to public whether these are already available or to be developed if yes then time frame?			
18.	Standards comparison And exceedances be reported on web			
19.	Different types of predefined formats of report preparation available or not?			
20.	Support various protocols Available till date as listed provided or not?			
21.	If new protocol-based software is to be developed whether firm will			
22.	Unlimited Number of stations supported by Central Server software or not? If not then support for how many stations will be provided			
23.	System compatibility with Dialup/ BB/ 2G/ 3G/ Wireless available or not?  If not then what technologies supported as on date?  What time frame if other to be develop.			
24.	Software has Wind rose reports generating capability			
25.	Software has pollution Rose generating facility			

<b>26.</b>	Software has diurnal Variation facility			
<b>27.</b>	Software has mathematical tools			
<b>28.</b>	Software has 16 channels display at on page			
<b>29.</b>	Software has data communication error reports			

