NATIONAL COMPETITIVE BIDDING FOR SUPPLY, INSTALLATION, COMMISSIONING AND OPERATION & MAINTENANCE SERVICES

OF
MOBILE CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS(MCAAQMS)
BIDDING DOCUMENT
VOLUME – I & II

BIDDING DOCUMENT

SUPPLY, INSTALLATION, COMMISSIONINGAND OPERATION & MAINTENANCE SERVICES

OF MOBILE CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS(MCAAQMS)

VOLUME – I

C O N T E N T S

INVITATION FOR BIDS (IFB)
NATIONAL COMPETITIVE BIDDING

TCN NO. …… Date: ……..

PROJECT: SUPPLY, INSTALLATION, COMMISSIONING AND OPERATION & MAINTENANCE SERVICES OF MOBILE CONTINUOUS AMBIENT AIRQUALITY MONITORING STATIONS (MCAAQMS)

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

Name of the work	:	Supply, Installation, Commissioning and Operation & Maintenance Services of Mobile Continuous Ambient Air Quality Monitoring Stations (MCAAQMS) for 5 nos.
EMD/Tender fee	:	Tender Document can be downloaded from the website https://jspcb.org.in/
Mode of Submission	:	Physical submission through speed post/ registered post/ courier or in person
Bid Price	:	Bidders to quote bid price in INR only.
EMD Price	:	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.

CRITICAL DATE SHEET

Description	**Date & Time**
Published Date	27/09/2025
Bid Document Download/Sale Start Date	27/09/2025
Clarification Start Date	09/10/2025
Clarification End Date	13/10/2025
Pre-Bid Meeting	16/10/2025
Uploading of Minutes/Clarifications on JSPCB Portal	17/10/2025
Bid Submission Start Date	24/10/2025
Bid Submission End Date	29/10/2025
Bid Opening Date	05/11/2025

2. 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 his associate as OEM partner meets the qualifying requirements stipulated here under for participation in the tender. The bidder shall furnish documentary evidence (Experience Certificate of providing service in particular domain) in order to establish that the bidder meets the following qualifying requirements.

The bidder should have at least five years of relevant experience as on in supply and installation of real time systems for Ambient Air Quality Monitoring.

For all the items not manufactured by the Bidder i.e., Analyzers, Monitors, Calibrators and Sensors, etc. the bidders should be authorized by the manufacturers for these items as per the format "Form of letter of authorities" provided as *Attachment 3 (Pg. 49)* of Section III, except where make is prescribed.

The bidder shall have supplied, tested Installed and commissioned at least 04 no's of Mobile Ambient Air Quality Monitoring Stations consisting of (NO/ NO2/ NOx, NH3-Ammonia, SO2, CO, Ozone, BTEX, PM10, PM2.5, 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 public sectors organization, 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 the above-mentioned analyzers and accessories. Experience of bidder and offered model should be of same make.

The bidder should be OEM / Manufacturer for supply of (NO/ NO2/ NOx, NH3-Ammonia, SO2, CO, Ozone, BTEX, PM_{10}, $PM_{2.5}$, Multigas Calibrator and rack mounted Zero Air Generator (OAM - Original Analyzer Manufacturer make)

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 audited annual report (Balance sheet & profit & loss statement) as a proof for the same alongwith certificate of Chartered Accountant stipulating that books of accounts have been properly audited.

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 any of 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 duly attested Invoice copy along with the technical bid.

3. As per Govt of India order No. P-45021/2/2017-PP (BE-II) Dated 04th June 2020 & OM No. P-45021/2/2017-PP (BE-II) dated 16th September 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 Class I & Class II who qualifies 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).

The Govt of India Order No. F.No. 6/18/2019-PPD dtd: 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.

The bidder should furnish the information on all past supplies and satisfactory performance, in "Performance Statement" as per Attachment No. 8B (Pg-57) and Attachment No. 8 C (Pg 58) of Section III and minimum two (2) no. documentary evidence (client certificates in favour of bidder or manufacturers of equipment) in support of the satisfactory operation of similar air quality monitoring stations.

The bidder or its associates as an OAM partner in India, (any authorized agency in India) should have well trained OAM personnel on its regular rolls as per following details and on award of LOI bidder shall submit the name of Project Engineer (Graduate Engineer), Technicians (Diploma holder in electronics/ instrumentation) and Data Processing Expert for central data management and CAAQM station respectively. Their resume, as proof of their regular employment with the bidder shall also be submitted. All personnel should be on pay roll of the OAM partner.

The O&M partner shall furnish an undertaking regarding carrying out satisfactory O &M of CAAQMS covered in this document as per terms & conditions of the document on behalf of the bidder. This information is to be provided as per Attachment 5 & 9 (Pg. 53 & 59) of Section III.

A complete set of bidding documents can be downloaded by any interested eligible bidder from **06/10/2025** from the website of https://jspcb.org.in/.

This bidding takes simultaneous bidding procedure in two part (envelope) bidding system. All the eligible and interested bidders are required to submit the Techno-Commercial Bid and Financial Bid simultaneously. Only the bidders whose Techno-commercial bid is found substantially responsive will be notified by the Board of the date and place to participate in the public opening of the financial bid, in writing later.

4. Eligible Bidders must submit their bids **for complete scope of work.** Any bid submitted for incomplete scope of work shall be rejected out rightly.

5. The Representative of Agents of Foreign Bidders in India are also permitted to purchase Tender Document on behalf of their principals by submitting a letter of authority from their principals and by depositing requisite cost of tender document.

6. Bidders to submit price bid in INR only.

7. **All the bids must be accompanied by bid security in accordance with the Instructions to Bidders in the bidding documents.**

8. All bids must be submitted on or before **29/10/2025**. Only the technical Bid will be opened first.

9. The bid must accompany bid security money as indicated above, failing which it will not be considered.
10. The JSPCB will not be responsible for any cost(s) or expense(s) incurred by bidders in connection with the preparation or delivery of bids.
11. The JSPCB reserves the right to reject any or all the bids without assigning any reason whatsoever.
12. In the event of date being declared as closed / holiday the date for submissions of bids and opening of bids will be the following working day at the appointed time.
13. Interested eligible Bidders may obtain further information from our office for the bidding documents.
14. The Selected Bidder may supply the materials through its registered Branch Office/ Sale Depot. / Authorized Dealer if present inside Jharkhand for the purpose of quick supply, services and
    local tax benefit to the State.
15. The Bidder should have a local office at Ranchi registered under local laws as on date of bidding.
    Note: An undertaking in this regard must be submitted by the bidder company on their letter head. If the service provider is not having Local presence, it has to open a local office at Ranchi within 15 days from issue of LoI/ Work-order and same must be communicated for future correspondence.

Description of works shall be as **per annexure -I** enclosed.

Note: - JSPCB reserves the right to alter / change above Schedule under unavoidable circumstance

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_2) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen ($NO/NO_2/NOx$) Analyzer	One
4.	Continuous Ambient Ammonia (NH_3) Analyzer	One
5.	Continuous Ambient Ozone (O_3) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM_{10} Particulate Matter Monitor	One
8.	Automatic $PM_{2.5}$ Particulate Matter Monitor	One
9.	Black Carbon (BC) Monitor	One
10.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
11.	Sampling system having 10 port manifolds	One
12	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
13	Multi-calibration systems for Gas Calibration and Meteorological,Flow and Electronic Calibration	One Set
14.	Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank- up Meteorological Tower.	One Set
15.	Computer system consisting of one PC along *Color 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 Set
16.	Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin.	One Set
17.	Air Conditioner, Split Type, Roof Mounted along with voltage stabilizer (1.5x1.5 ton)	2 Units
18.	Online UPS (1x5 KVA, 2 **Hours** backup)	One Set
19.	5 KVA Petrol Generator	One Unit

VOLUME 1

SECTION I (ITB)

INSTRUCTIONS TO BIDDERS

C O N T E N T S

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 copied of any missing documents. Failures to do so will be at the Bidder's risk.

INSTRUCTION TO BIDDERS

DEFINITIONS

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

"The Project" or "The Works" means supply, installation & Commissioning of Equipments for Mobile Continuous Ambient Air Quality Monitoring Stations (MCAAQMS) and Operation & Maintenance of MCAAQMS at the pre-defined city/ location

"The Authority" means the Member Secretory, 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.

"The Bid" means the offer or proposal of the Bidder to be submitted for the works in accordance with the stipulations set forth in this Bidding Documents.

"The Techno-commercial Bid" means the Techno-commercial part of the Bid.

"The Financial Bid" means the financial part of the Bid.

"The Bidder" means either the manufacturer of the Equipment or his Authorized Representative, who submits the Bid for the Works.

"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 (Pg. 49)* of Section III.

"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.

"The Manufacturers" means the firms, which produces the equipment to be furnished by the Contractor under the Contract with the JSPCB.

"The Bidding Documents" mean all the documents in Volume I and II in the bidding documents annexed thereto.

"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.

"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.

"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.

"S/W" means the Scope of Works in Section II of this Volume.

"The Sites" means Continuous Ambient Air Quality Monitoring Station (CAAQMS) at the defined city/ location.

"The Contract Price" means the price payable to the contractor under the contract for the full and proper performance of its contractual obligations.

INTRODUCTION

The Jharkhand State Pollution Control Board intends to invite bids from eligible bidders for supply, installation & commissioning of equipments for Mobile Continuous Ambient Air Quality Monitoring Station (MCAAQMS) and operation & Maintenance of CAAQMS at specified city / locations wise.

Scope of Works

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

Size of Bid

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

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 (Pg 52)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 equipment available with the O&M partner in India mentioning the ones not available in India and have to be imported in case necessary after the expiry of 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 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.

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 his associate as O&M partner 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.

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

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.

The bidder shall have supplied, tested Installed and commissioned at least 04 no's of Mobile Ambient Air Quality Monitoring Stations consisting of (NO/ NO2/ NOx, NH3-Ammonia, SO2, CO, Ozone, BTEX, PM10, PM2.5, Multi-point dilution calibrator and rack mounted Zero Air Generator (OAM - original analyser manufacturer make), Meteorological System, including Mobile Chassis & mobile body fabrication in any one of last 05 years to any of public sectors organization, 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 the above-mentioned analyzers and

accessories. Experience of bidder and offered model should be of same make.
The bidder should be OEM / Manufacturer for supply of (NO/ NO2/ NOx, NH3-Ammonia, SO2, CO, Ozone, BTEX, PM10, PM2.5, multi-point dilution calibrator and rack mounted Zero Air Generator (OAM - original analyser manufacturer make).

The bidder, a manufacturer or authorized representative must design and manufactures 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.

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 a proof for the same.

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 any of public sectors 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 duly attested Invoice copy along with the technical bid.

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 Class I & Class II who qualifies 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)

For all the items not manufactured by the Bidder i.e. Analyzers, Monitors, Calibratorsand 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 (Pg. 49)* of Section 3 except where make is prescribed.

The Govt of India Order No. F. No. 6/18/2019-PPD dtd: 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.

Bids of bidders quoting as authorized representative of a **manufacturer, who meets 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 (Pg 49), 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 Ambient Air Quality Monitoring Stations consisting of (NO/ NO2/ NOx, NH3-Ammonia, SO2, CO, Ozone, BTEX, PM10, PM2.5, Multigas calibrator and rack mounted Zero Air Generator (OAM - original analyser manufacturer make), Meteorological System, including Mobile Chassis & mobile body fabrication in any one of last 05 years to any of public sectors organisation, 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 analysers and accessories. Experience of bidder and offered model should be of same make.

(iii) The bidder should be OEM / Manufacturer for supply of (NO/ NO2/ NOx, NH3-Ammonia, SO2, CO, Ozone, BTEX, PM10, PM2.5, Multigas calibrator and rack mounted Zero Air Generator (OAM - original analyser manufacturer make)

(iv) In this tender, either the Authorised 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 Authorised Representative submits a bid on behalf of the Principal/OEM, the same Authorised Representative cannot submit a bid on behalf of another Principal/ OEM in the same tender for the same item/product.

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 (Pg 57 & 58) 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_2, NH_3, $NO/NO_2/NO_x$, O_3, BTX, PM_{10}, $PM_{2.5}$) 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.

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

The bidder or their associate as O&M partner should have adequate O&M experience of similar monitoring station for minimum 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 minimum 25 Nos. of well-trained O&M personnel on its regular rolls as per 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 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. for each 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 no.* of Technician for operation of Mobile CAAQMS shall be stationed in Mobile Van for operation of CAAQMS.

2.5.13 The O&M partner shall furnish an undertaking regarding carrying out satisfactory O&M of CAAQMS covered in this document as per terms & conditions of the document on behalf of the bidder. This information is to be provided as per Attachment 5 & 9 (Pg. 53 & 59) of Section III.

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 e-tender Bidding procedure.

(2) Both the part 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 who's 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) .pdf file. The first is theBid Security; the second is the qualification documents, and the third will contain the technical specifications pursuant to Clause 5 of this Instructions

(4) The Financial Bid shall consist of documents pursuant to Clause 6 of these Instructions.

(5) The bidder must quote for complete scope of work in a single package. In case the bidder does not quote for complete scope of work, the bid shall be rejected at Techno-commercial evaluation stage.

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

BIDDING DOCUMENTS

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/

Contents of Bidding Documents

(1) The Bidding Documents include:

Volume I

Invitation for Bids

SECTION I	INSTRUCTION TO BIDDERS
SECTION II	SCOPE OF WORKS
SECTION III	FORM OF TECHNO-COMMERCIAL BID
SECTION IV	FORM OF FINANCIAL BID
SECTION V	GENERAL CONDITIONS OF CONTRACT
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 anydoubt may occur concerning the Bidding Documents.

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.
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.

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

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

PREPARATION AND SUBMISSION OF BID

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.

One Bid per Bidder

Each Bidder shall submit one Bid only.

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:
1) The precise relationship between the Bidder and his Indian Agent.
2) The mutual interest which the Bidder and the Indian Agent have in business of each other.
3) 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.
4) Indian Agent's Income Tax Permanent Account Number.
5) Bidder's Income Tax Permanent Account Number.
6) All services to be rendered by the Indian Agent whether of general nature or in relation to the particular contract.
7) All above statements have to be substantiated by authenticated documents from competent authority.

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 at pg-60 and 61 of TCN in favour of the **……**, payable at ..... The *NSIC registered companies* (Explanation: Traders/ resellers/ distributers/ 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....., payable at..... 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.

(4) 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.

(5) 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.

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

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 periodof 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.

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.

Contacting the JSPCB

Except for responses to request 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 his decision in respect of evaluation of the Bid or award of the Contract shall result in the rejection of the Bid and forfeiture of the Bid security.

PREPARATION OF TECHNO-COMMERCIAL BID

The Bidder shall enclose his scan copy of the Bid Security in the mentioned .pdf file in

the portal i.e., https://jspcb.org.in/ and "ORIGINAL" will be submitted on the date mentioned in the NIT.

Contents of Folder "B", Qualification Documents

The Bidder shall enclose his scan copy of all the Qualification documents as follows in the mentioned .pdf file in the portal i.e https://jspcb.org.in/.

1) Authorization letter authorizing the signatory of the Bid to commit the Bidder (Powerof attorney to sign the Bid).

2) Attachments in support of meeting qualifying requirements as per Clause No. 2.5 (Section-I, ITB) for the quoted packages (Attachments 8A (Pg. 56), 8 B (Pg. 57, 8 C(Pg. 58) & 9 (Pg.59) of Section-III).
(Attachment-8A: The bidder in its letter head shall submit the turnover details supported with Annual Report in Attachment-8A)

(Attachment-8B: The bidder in its letter head shall submit its performance statement on year-wise CAAQMS installed, for last 5 years supported with documentary evidence as per Clause 2.5.5 Section-I (Invitation for Bid)

(Attachment-8C: The bidder in its letter head shall submit its performance statement as O&M Operator/ O&M Partner on year-wise CAAQMS installed, service rendered for last 5 years supported with documentary evidence as per Clause 2.5.5 Section-I (Invitation for Bid)

(Attachment-9: The bidder in letter head of O&M Partner shall submit the details as O&M Operator proposed manpower deployment for the project supported with attachments of curriculum vitae.

3) Certificate of local branch, sales, residential and representative office(s) of the Bidder in India as per certificate from pursuant to Attachment 2 (Pg. 48) of Section III.

(Attachment-2: The bidder in its letter head 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 prescribed format (Attachment- 2, and no supporting annexures shall be attached)

4) Certificate of letter of authority from manufacturers for all the Analyzer Equipment (Attachment 3 (Pg. 49) of Section III).

(Attachment-3: The Bidder shall obtain and submit the letter of authority in Attachment-3, from manufacturer of analyzer equipment and UPS in letter head of the manufacturer. For different analyzer equipment and UPS, the bidder shall obtain separate letter of authority from respective manufacturers in their letter heads in Attachment-3. If the bidder is the manufacturers of equipment, he shall submit the letter of authority in his letter head of the equipment manufactured

by him.
However; Name of Single Manufacturer for specified equipment/analyzer is to be proposed for evaluation of technical and commercial bid.)

5) Form of Certificate of supply of spares and consumables, by the manufacturer, in Attachment-3A (Pg. 51)

(Attachment-3A: The Bidder shall obtain and submit the certificate in Attachment- 3A from manufacturer of analyzer equipment and UPS in letter head of the manufacturer for supply of spares and consumable. For different analyzer equipment and UPS, the bidder shall obtain separate certificates in Attachment-3A, from respective manufacturers in their letter heads. If the bidder is the manufacturers of equipment, he shall submit the certificate in Attachment-3A in his letter head of the equipment manufactured by him
However; Name of Single Manufacturer for specified equipment/ analyzers is to be proposed for evaluation of technical and commercial bid.)

6) Certificate from manufacturer stating the country of origin of each Equipment duly authenticated by competent authority of that country (Attachment 4 (Pg. 52) of Section III).

(Attachment-4: The Bidder shall obtain and submit the certificate in Attachment-4 from manufacturer of analyzer equipment and UPS in letter head of the manufacturer detailing each equipment with its country of origin. For different analyzer equipment and UPS, the bidder shall obtain separate certificates in Attachment-4, from respective manufacturers in their letter heads. If the bidder is the manufacturers of equipment, he shall submit the certificate in Attachment-4 in his letter head of the equipment manufactured by him
However; Name of Single Manufacturer for specified equipment/ analyzers is to be proposed for evaluation of technical and commercial bid.)

7) Certificate of carrying out O&M by O&M Partner (Attachment 5 (Pg. 53) of Section III).
(Attachment-5: The Bidder shall obtain and submit the certificate in Attachment-5 from the proposed O&M Partner, in letter head of the O & M Partner, for carrying out O&M for the CAAQMS to be installed at specified locations. If the bidder is the proposed O &M Partner, he shall submit the certificate in Attachment-5 in his letter head.
Note: The experience of the proposed O & M Partner will be considered evaluation of technical and commercial bid)

8) List of Equipment offered (Attachment 6 (Pg. 54) of Section III).

(Attachment-6: The bidder in its letter head shall submit the list of all equipment imported / indigenous with its country of origin in Attachment-6. However; Name of Single Manufacturer for specified equipment/ analyzers is to

be proposed for evaluation of technical and commercial bid.)
Note: Only the details as sought for shall be filled in prescribed format (Attachment- 6, and no supporting annexures shall be attached)

9) List of Manufacturers of the equipment offered (Attachment 7 (Pg. 55) of Section III).

(Attachment-6: The bidder in its letter head shall submit the list of all equipment imported / indigenous with its manufacturer in Attachment-7. However; Name of Single Manufacturer for specified equipment/ analyzers is to be proposed for evaluation of technical and commercial bid.)
Note: Only the details as sought for shall be filled in prescribed format (Attachment- 7, and no supporting annexures shall be attached)

10) Pre-requisites for installation of equipment offered (Attachment 11 (Pg. 62) of SectionIII).
(Attachment-11: The bidder in its letter head shall submit the details in Attachment- 11 as sought for.
Note: Only the details as sought for shall be filled in prescribed format (Attachment- 11, and no supporting annexures shall be attached)

11) The Authorized Indian Agent/Representative of Indian Supplier should have 02 years continuous agency partnership/joint venture/ preparation or collaboration with their Principal foreign supplier. The documentary proof of such agency ship/ authorization/ MOU should be submitted along with technical part. The bid of the firm that does not contain the proof of such nomination/ authorization as Indian agent will be rejected.

Contents of Folder "C"; Techno-commercial bid including Technical Specifications and Catalogs

The Bidder shall enclose his scan copy of the "TECHNICAL SPECIFICATION AND CATALOGS" in the mentioned .pdf file in the portal i.e https://jspcb.org.in/.

The following documents shall be attached as a pdf document marked "C-TECHNICAL SPECIFICATION AND CATALOGS" 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 item specified in schedule of requirement. 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 page no of 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 that there is no deviation from the Authority's requirement, the Bidder must write down "complied" in the column for "Bidder's Response" *supported with Bidders 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 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 in regards of 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.

PREPARATION OF FINANCIAL BID

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 scan copy of the same will be uploaded in the portal i.e., https://jspcb.org.in/ in Financial packet only.

Bid Form

The Bid Price to be quoted by the Bidder shall be prepared on the official letter head of the respective Bidder according to the Attachment-1 (Pg 81) "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.

Summary of Bid Price

Summary of Bid Price shall be prepared and submitted in accordance with the Attachment 2 (Pg 83) 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:

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 cost, if any. Then the Bidder shall specify the same.

(i) Price of other incidental cost such as Indian Agent's Commission, if any. The Bidder shall specify the same.

(ii) Cost of O&M of CAAQMS for Five (5) years including insurance.

(iii) Training

The Bidder shall quote the price for the training as indicated in clause 10 (Pg. 40) ofScope of Works.
Cost of Travel, Boarding & Lodging and local transport cost of participants shall be borne by the Bidder.

***Note :**

(1) 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.

(2) GST on supply & O&M charges as applicable shall be paid extra as actual the Authority.

(3) The above ceiling O&M cost also includes incidental charges (Security, Electricity, Data Connectivity, Stations Supervisor, insurance) and services.

(4) The health of the Stations should be sound for the entire period (05 yeas) so that thecontract can be further renewed on mutual agreement.

Bid Price Breakup

The Bidder shall prepare and submit the Bid Price (Excluding all taxes) and currency as per the BoQ available in e-Procurement portal i.e. https://jspcb.org.in/ for each item.

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.

COMPLETION AND SUBMISSION OF BID

Completion of Bids

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.

Financial Bid

The Bidder shall upload the Price Bid in BoQ available in the https://jspcb.org.in/ and necessary financial document as .pdf and as per the instructions available in the e- Procurement portal.

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.

OPENING AND EVALUATION OF TECHNO-COMMERCIAL BID

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.

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 are award decisions may result in the rejection of the Bidder's Bid. The request for clarification and response shall be writing or by email, but nochange 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.

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.

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 pursuance 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.

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.

Evaluation Criteria of Techno-commercial Bid

The Bidder who fulfill 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. OPENING OF FINANCIAL BID

Opening of the financial packet will be communicated through e-Procurement portal to the qualified bidder through letter or SMS or Mail.

11. EXAMINATION OF FINANCIAL BID

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.

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. EVALUATION AND COMPARISON OF FINANCIAL BID

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.

The purchaser's evaluation of a bid will take into account 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 (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)

II. 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 owner and will not be considered for the purpose of price bid evaluation.

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

Clarification on Financial Bid

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

Cost Compensation for deviations

Deviations specifically declared by the bidders in 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 pertaining to any rebates, shall not be given effect to in evaluation and it will be assumed that the bidder complies to all the conditions of Bidding Documents. In case bidder refuses to withdraw, without any cost of the Owner, those deviations, which the bidder did notstate in the Deviation Schedules, the bid shall be rejected, and the bid security of the bidder may be forfeited.

13. AWARD OF CONTRACT

Award of Contract to Successful Bidder

The Authority will award the Contract to 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.

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.

Signing of Contract

Within Thirty (30) days of the receipt of notification of award from the Authority, the successful Bidder shall sign and date of Contract.

The Contract shall take the form of General and Special Condition attached to Section

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. 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 high ranked Bidder or call for new Bids.

15. 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. 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 asmay 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

1.0 DETAILS OF PROJECT STRUCTURE

(a) Successful Bidder would be awarded the project/work under a Supply and Service Agreement, which would entail:

1. Supply, installation and Commissioning of One Set of CAAQMS Equipment at the defined cities/ locations
2. Operation and Maintenance of the CAAQMS for a period of 5 years from the date of it's the commissioning
3. Daily reporting of data pertaining to Ambient Air Quality to JSPCB. The authorities would make payment for CAAQMS as per schedule of requirement, for Supply, Installation and Commissioning of the system. The authorities would procure all the CAAQMS equipment on its name. 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 Installation and Commissioning of the System and;

   (b) Reporting of data to Authority. The price for the data supplywould include the Operation and Maintenance, including incidental charges, electricity, manpower, security, etc.

The authority would provide land for installation of CAAQMS free of cost, in the identified city/location to the Successful Bidder. Along with the land, Authority would provide letter/ documents for telephone and electricity connections at the proposed location. The bidder would bear the initial installation cost for these facilities and the monthly recurring cost pertaining to their usage (monthly telephone and electricity bill) would also be borne by the Successful Bidder.

One no. of Day light & Night visible data display system is to be supplied, installed and maintained initially for five years. Authority would identify location for installation of Day light & Night visible data display system. The successful bidder shall also arrange Lease line (main medium of data connectivity) also Broadband/telephone/ Data Card (as Back up connection) with electricity connections at the identified location and all the documents required for the connection shall be provided by the Authority. The Successful Bidder would bear the initial installation cost for these facilities and the monthly/recurring cost pertaining to their usage (monthly telephone and electricity bill) would also be borne by the Bidder. All other foundation, installation, connectivity requirement for Data Display System is to be arranged by the successful bidder and cost for same should be included in bid price.

(b) SCHEDULE OF REQUIREMENTS

Each CAAQMS 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.

Sl. No.	Name of the instrument/ Equipment/ Item	Quantity (Nos)
1.	Continuous Ambient Carbon Monoxide (CO) Analyzer	One
2.	Continuous Ambient Sulphur Dioxide (SO_2) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen ($NO/NO_2/NOx$) Analyzer	One
4.	Continuous Ambient Ammonia (NH_3) Analyzer	One
5.	Continuous Ambient Ozone (O_3) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM_{10} Particulate Matter Monitor	One
8.	Automatic $PM_{2.5}$ Particulate Matter Monitor	One
9.	Black Carbon (BC) Monitor	One
10.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
11.	Sampling system having 10 port manifolds	One
12	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 Set
13	Multi-calibration systems for Gas Calibration and Meteorological,Flow and Electronic Calibration	One Set
14.	Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank- up Meteorological Tower.	One Set
15.	Computer system consisting of one PC along *Color 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 Set
16.	Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin.	One Set
17.	Air Conditioner, Split Type, Roof Mounted along with voltage stabiliser (1.5x1.5 ton)	2 Units
18.	Online UPS (1x5 KVA, 2 **Hours** backup)	One Set
10.	5 KVA Petrol Generator	One Unit

SCOPE OF SERVICES

The Scope of Works under the package shall include:

A) 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.
B) Operation & Maintenance of Air Monitoring Stations for a period of five (5) years from the date of commissioning of the station, which can be extended for more years at the mutually agreed rates and terms and conditions.
C) Data & Report of data pertaining to CAAQMS to JSPCB.
D) Online transfer of data as directed by the JSPCB.

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

3.0 MINIMUM TECHNICAL SPECIFICATIONS

The minimum technical specification requirements for the CAAQMS 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 Mobile CAAQMS equipment to be installed at are givenin 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 NH_3) and shall be of the latest model and design and a certificate in this regard also needs to be submitted.

Successful bidder shall submit a Standard Operating Procedure for the air quality monitoring station to the JSPCB before award of contract. This Standard Operating Procedure shall be approved by the Authority prior to 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 attachment X_1 to X_5
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 US EPA or manufacturers 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 required audit. The results of these audits shall be made immediately available to both the Successful Bidder Seller and Buyer.

Operator shall participate in Proficiency Testing Exercise organized by reputed organization.

GENERAL GUIDELINES

Working Hours: The site for CAAQMS operation should be maintained to work-mannedby 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 plat form, pillars Electricity & telephone / modem arrangement:

The successful bidder shall construct 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 Air Monitoring Station shall be decided by the Authority and city wise areas under:

Sl No.	Location and City	Number of Mobile CAAQMS
1.		
2.		
3.		
4.		

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.

INSPECTION AND TEST

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.

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

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

Operation & maintenance of Continuous Ambient Quality Air Monitoring Stations

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 equipments 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 thisContract, 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) 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 Mobile CAAQM station operational.

iii) Take reasonable action to assure that the Personnel deployed at Air MonitoringStations and any subcontractors and agents are provided with a workplace in compliance with applicable Law.

iv) Keep the Mobile Air Monitoring Stations clean, well maintained and in good working condition.

v) 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.

vi) Unscheduled Maintenance: Perform all Unscheduled Maintenance and repairs for all equipment, auxiliaries etc. within (24) hours of the

occurrence of the event requiring Unscheduled Maintenance, 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.

vii) The Contractor shall source all the spares required for maintenance & repairs of the installed analyser equipment from O&M only.

e) 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 off any assets, settle law-suits or engage in transactions relating thereto on the Owner's behalf without the prior written approval of the Owner.

f) 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, allthe spares shall be sourced from OEMs only.

g) 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.

h) 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 X_1 to X_5**

i) 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.

j) Provide data collected through operation of the equipment on daily basis in suggestedoutput 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.

iii) Provide the operational date required to all competent authorities including,Government of India or concerned State Governments as directed by JSPCB.

iv) Online transfer of data to JSPCB web site/ server.

k) The Contractor shall ensure accuracy of the data provided as per standards.

l) These Mobile CAAQMS van 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**.

Owner shall arrange for the following and Contractor shall guide and assist the Owner:

a) 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.

b) Owner shall pay all fees including applicable Taxes, etc., imposed upon Owner by the Applicable Law pertaining to works under this contract.

c) The Owner shall identify and hand over the site for erection & commissioning of Air Monitoring Stations free from all encumbrances.

d) The Owner shall make the arrangement for letter / documents for operation of Mobile CAAQMS at the specified location for sampling.

e) Fuel charges, toll/fastag charges, electricity charges would be borne by the Board on actual basis

f) 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.

g) 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

Handing Over of Station: On expiry/closure/termination of the Contract Agreement, stations shall be handed over to JSPCB in working condition to the satisfaction of JSPCB. Few or all the spares procured by the Contractor and unused as on date of handing over may be purchased by the Owner at his 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.

Relocation of Station:
During contract period, if Authority intends to shift Mobile CAAQM station from one location of the city to another location, due to some reason – functional or otherwise, Bidder shall shift the same to new locations based on the requirement of sampling.

Penalties:

During O&M period, in case of any Analyzer/ system failure, penalty will be charged by Authority @ Rs.1,000/- (one thousand) per day per Analyzer after a grace period of seven (7) continuous non-working days. The grace period of seven (7) continuous non-working days shall be given only once per quarter (3 months).

For a failure of Data display:

JSPCB/panel, a penalty will be charged by SPCB @ Rs. 1,000/- (one thousand) per day after a grace period of five (5) continuous non-working days. The grace period of Five (5) continuous non-working days shall be given only once per quarter (3 months).

Failure due to power/ mobile network outage and other Force Major conditions shall not beconsidered for levy of penalty.

Total penalty per year during O&M period on account of above conditions shall be limited to 30% of total O&M charges for one year. Failing which defective/ malfunctioning analyser / system has to be replaced.

In case penalty in the year exceeds 30% as above, the Contractor shall be required to replace the defective analyzer (s) or systems with new ones at his own cost, failing which the JSPCB shall have the right to terminate the O&M contract.

SCHEDULE

Contractor shall complete all activities covered in the scope of work up to installation & commissioning of Air Monitoring Stations within 250 days from date of signing of contract agreement by both the parties.

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

The operation and maintenance contract shall be executed by the Authority**.** The terms and condition shall be governed as per the tender document. The Authority or any person authorized by him shall be the ultimate consignee.

Attachment 1

Equipment List for 1 (each) CAAQMS

Sl. No.	Name of the instrument/ Equipment/ Item	Quantity (Nos)
1.	Continuous Ambient Carbon Monoxide (CO) Analyzer	One
2.	Continuous Ambient Sulphur Dioxide (SO_2) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen ($NO/NO_2/NOx$) Analyzer	One
4.	Continuous Ambient Ammonia (NH_3) Analyzer	One
5.	Continuous Ambient Ozone (O_3) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM_{10} Particulate Matter Monitor	One
8.	Automatic $PM_{2.5}$ Particulate Matter Monitor	One
9.	Black Carbon (BC) Monitor	One
10.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
11.	Sampling system having 10 port manifolds	One
12	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
13	Multi-calibration systems for Gas Calibration and Meteorological,Flow and Electronic Calibration	One Set
14.	Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank- up Meteorological Tower.	One Set
15.	The computer system consisting of one PC along *Color 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 Set
16.	Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin.	One Set
17.	Air Conditioner, Split Type, Roof Mounted along with voltage stabilizer (1.5x1.5 ton)	2 Units
18.	Online UPS (1x5 KVA, 2 **Hours** backup)	One Set
19.	5 KVA Petrol Generator	One Unit

Annexure I

Attachment 2
STATION PROTOCOL FOR
CAAQM STATION UNDER O&M CONTRACT

NAME OF CAAQM STATION **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_2** Analyzer											
3.	**NO_x** Analyzer/											
	NO											
	NO_2											
	NOx											
	NH_3 Analyser											
4.	**O_3** Analyzer											
5.	**BTX** Analyzer											
	Benzene											
	Toluene											
	E-benzene											
	M+P Xylene											
	O-Xylene											
6.	**Dust** Analyzer											
	$PM_{2.5}$											
	PM_{10}											
7.	**Meteorological Parameter**											
	Temperature											
	Humidity											
	Wind Speed											
	Wind Direction											
	Solar Radiation											
	Rain Fall											
8.	**Computers**	Make/Model:			Status:							
9.	**UPS / ACs / Others**	Make/Model:			Status:							
10.	**Data Display Board**	Make/Model:			Status:							
	Maintenance Requirement	**Details/**	1. 2.									
	Specific Observation(s)											

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:**

HOURS	WIND SPEED	WIND DIRECTION	HUMIDITY	TEMPERATURE	SOLAR RADIATION	RAINFALL	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							
Min.							
Max.							
Average							

Attachment 4

MONTHLY REPORTING FORMAT FOR METREOLOGICAL PARAMETERS

(To be submitted monthly next day ending month)

Location: **Month:**

DATE	WIND SPEED	WIND DIRECTION	HUMIDITY	TEMPERATURE	SOLAR RADIATION	RAINFALL	REMARKS
Min.							
Max.							
Average							

Attachment 5

DAILY REPORTING FORMAT FOR MAIN POLLUTANTS

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

DAILY AMBIENT AIR QUALITY DATA

Location: **Month:**

Hrs.	SO2	NO	NO2	NOX	NH3	CO	O3	PM 2.5	PM 10	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 MAIN POLLUTANTS

(To be submitted monthly at 12 Noon next day ending month)

MONTHLY AMBIENT AIR QUALITY DATA

Location: **Month:**

Date	SO2	NO	NO2	NOX	NH3	CO	O3	PM 2.5	PM 10	Benz ene	Tolu ene	Xylene	Rem arks
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
Min.													
Max.													
Average													

VOLUME

I

SECTION

III

FORM OF TECHNO-COMMERCIAL BID

SECTION III

FORM OF TECHNO-COMMERCIAL BID

Attachment 1

<Letterhead of the Bidder>

FORM OF QUESTIONNAIRE

(To be submitted before pre-bid meeting)

Bidding Documents for Supply, Installation & Commissioning of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and Operation & Maintenance Services for this CAAQMS At

Sl No.	Location and City	Number of CAAQMS
1.		
2.		
3.		
4.		

Date:

To,

MS, JSPCB,

……..

From: Name of Bidder

Address
Name of Representative
Position
Fax No. 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,

MS, JSPCB,

……

Subject :- Certificate of Existence of Local Branch, Sales Residential andRepresentative 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

FORM OF LETTER OF AUTHORITY
<Letterhead of the Manufacturer>

To,

MS, JSPCB,
……

Name of Manufacturer
Subject:- Letter of Authority from

ManufacturerRef: Tender No- Dt.

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 Continuous Ambient Air Quality Monitoring Stations (CAAQMS) 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 ----------

2020.

ACCEPTED ON....., 2020

NAME OF BIDDER	NAME OF ISSUING MANUFACTURER
----------	----------
(Name of duly authorized representative to sign and signature)	(Name of duly authorized representative to sign and signature)
----------	.....
(Rank of position and Department)	(Rank of position and Department)

Attachment 3A

<Letterhead of the Manufacturer>

FORM OF CERTIFICATE OF SUPPLY OF SPARES AND CONSUMABLES BY MANUFACTURER

Date:

To,

MS, JSPCB**,**

……

Sub:- 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 partsof the equipment mentioned below during O&M period under the contract (contract detail) to thecontractor (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.

Item No.	Name of Equipment	Name of Manufacturer

Signature:
Name of
Person:
Position:
Name of Manufacturer:
Office Seal of
Manufacturer:
Legal Address of Manufacturer:

Attachment 4

<Letterhead of the Manufacturer>

FORM OF CERTIFICATE OF COUNTRY OF ORIGIN

To,

MS, JSPCB,

……..

Name of Manufacturer

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:Title:
Name of
Manufacturer:Legal
Address:

Attachment 5

<Letterhead of the O&M Partner>

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

Date:

To:

MS, JSPCB**,**

……

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
bidderName of Person:
Position:
Name of the Bidder:
Office Seal of Bidder:
Legal Address of
Bidder:

Attachment 6

<Letterhead of the Bidder>

List of Equipment Imported and indigenous

S. No.	Name of equipment	Quantity	Country of Origin

Signature:

Name

Designation

:Seal:

Dated:

Attachment 7

<Letterhead of the Bidder>

List of Manufacturer of equipment imported and indigenous

Sl. No.	Name of equipment	Name of manufacturer

Signature:

Name

Designation

:Seal:

Dated:

Attachment 8 A
<Letterhead of the Bidder>

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

Name of the Bidder ……..

Year	Currency	Turnover
2018-2019 financial year		
2019-2020financial year		
2020-2021 financial year		
Average		

Note:

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

Signature of the Authorized
RepresentativeName of the Person
Positio
nSeal
Date

Attachment 8 B
<Letterhead of the Bidder>

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

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

Signature of the Authorized
RepresentativeName of the Person
Position
Seal Date

Attachment 8 C
<Letterhead of the Bidder>

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

Order placedby (full address of Purchaser)	Order No.& Date	Description of ordered equipment (CAAQMS) (Model no.)	Quantity supplied	Value of order	Date of commissionin gand handing over	Has the equipment been satisfactory functioning? (Attach certificates from the Purchaser/ Consignee as per Clause 2.5.5 Section-I of ITB)
1	**2**	**3**	**4**	**5**	**6**	**7**

Signature of the Authorized
RepresentativeName of the Person
Position
Seal Date

Attachment 9

<Letterhead of the O&M Operator/Partner>

CAPABILITY & EXPERIENCE OF O&M OPERATOR/ PARTNER

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

Sl. No.	Name of the O&M personnelproposed to be deployed	Educational Qualification	Experience in no. of years in carrying out O&M of CRWQMS.	Detail curriculum Vitae Attached(YES / NO)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				

Signature of the O& M

Partner:Name of the person:
Position
: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,

MS, JSPCB**,**

……..

Dear Sirs,

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 2021.

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 theperiod 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, whichthe bidder did not state in the Deviation Schedules.

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 BANK]
By.....
(Title)
Authorized Representative

(Signature of Witness)

Name of Witness .....

Address of Witness.....

Attachment 11

<Letterhead of the Bidder>

PRE-REQUISITES FOR INSTALLATION OF EQUIPMENT

To :

MS, JSPCB,

……

Dear Sir,

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

Package no. / Item No.	**Name of the Equipment**	**Installation & commissioning pre-requisites***

Signature of the Authorized
RepresentativeName of the Person
Position
Seal: Date:

Attachment 12

<Letterhead of the Bidder>

SUPPLY, INSTALLATION & COMMISSIONING OF CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS (CAAQMS) AND OPERATION & MAINTENANCE SERVICES FOR CAAQMS AT ---------- FOR ----------

(Deviation Schedule)

Bidders Name & Address

To,

MS, JSPCB,

……..

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 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. The deviation schedule is submitted as per Table at Volume-III (Annexure-II).

Date:

Place

(Signature)

……
(Printed Name)
……
(Designation)
……
(Common Seal)

Attachment 13

INDEMNITY BOND FOR HANDING OVER AIR MONITORING STATIONS INCLUDING ALL EQUIPMENT TO THE O&M CONTRACTOR

This Indemnity Bond is made this …….. Day of 2021……..
By……..a Company registered under the CompanieAct,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 **……** with Office at **……..**, which term shall include permitted assigns and successors,(hereinafter called "SPCB" which expression shall include its successors and assigns).

Whereas Authority has awarded to the Contractor, a contract for O&M of the Continuous Ambient Air Monitoring Stations (CAAQMS located at ----------, vide its Letter of Indent / 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 SPCB 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 Equipment 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 SPCB indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipments 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 Continuous Ambient Air Monitoring Stations (CAAQMS) belonging to SPCB against all risks whatsoever till the Equipments are duly used in accordance with all terms of the Contract. The Contractor undertakes to keep SPCB 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 criminal breach of trust on the part of the Contractor for all intents and purposes including legal / penal consequences.

4. That SPCB is and shall remain the exclusive Owner of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The Equipments shall at all times be open to inspection and checking by Project-in-Charge SPCB 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, misutilised or converted touses 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 SPCB to return the Equipments without any demur or reservation.

5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever then the Contractor hereby agrees that the decision of the Project-in-Charge of SPCB as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and / or damaged Equipment at its own or remedy that may be available to SPCB against the Contractor under the Contract and under this Indemnity Bond.

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 SPCB, then the above bondshall 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

Particulars of the Equipments handed over	Quantity	Value of the Equipment	Signature of Authorized Person

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

(Common Seal)
(In case of Company)

Attachment 14

LIST OF BANKS ACCEPTABLE FOR SUBMISSIONOF BANK GUARANTEE FOR BID SECURITY

SCHEDULED COMMERCIAL 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) NATIONALISED BANKS

9. Allahabad Bank
10. Andhra Bank
11. Bank of India
12. Bank of Maharashtra
13. Canara Bank
14. Central Bank of India
15. Corporation Bank
16. Dena Bank
17. Indian Bank
18. Indian Overseas Bank
19. Oriental Bank of Commerce
20. Punjab National Bank
21. Punjab & Sind Bank
22. Syndicate Bank
23. Union Bank of India
24. United Bank of India
25. UCO Bank
26. Vijaya Bank
27. 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 SECURITIESAND SECURITIES FOR DEED OF JOINT UNDERTAKING

SCHEDULED COMMERCIAL 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. Nationalised Banks

9. Allahabad Bank
10. Andhra Bank
11. Bank of India
12. Bank of Maharashtra
13. Canara Bank
14. Central Bank of India
15. Corporation Bank
16. Dena Bank
17. Indian Bank
18. Indian Overseas Bank
19. Oriental Bank of Commerce
20. Punjab National Bank
21. Punjab & Sind Bank
22. Syndicate Bank
23. Union Bank of India
24. United Bank of India
25. UCO Bank
26. Vijaya Bank
27. 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 Bank N. V.
12. Bank of Nova Scotia
13. Development Bank of Singapore i.e. DBS, Singapore

D. SCHEDULED PRIVATE BANKS

1. ING 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 2021, 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) ofthe 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

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 park 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 thecontract 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 door 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, iscommitted 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, includinginformation 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 throughany other manner without supporting it with full and verifiable facts.

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

If the BIDDER or any employee of the BIDDER or any person action on behalf ofthe 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 monetarydealings or transactions, directly or indirectly, with any employee ofthe 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 beterminated for such reason.

5. Sanctions for Violations

Any breach of the aforesaid provisions by the BIDDER or any one employed by it oracting 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 itor acting on its behalf (whether with or without the knowledge of the BIDDER), ofan 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 inrespect 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 wassupplied by the BIDDER to any other Ministry/Department of the Government ofIndia, 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 toall 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 impacton the contractual relations between the parties. The parties will offer to the Monitorthe 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 necessaryinformation 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 theseat/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 Member Secretary	BIDDER CHIEF EXECUTIVE OFFICER

Witness	Witness
1……	1……
2……	2……

VOLUME I

SECTION

IV

FORM OF FINANCIAL BID

SECTION IV

FORM OF FINANCIAL BID

CONTENTS

Attachment 1

<Letterhead of the Bidder>

Date:

Grant no.:

Bid No.

BID FORM

To,

……..

……..

Gentlemen:

1. Having examined the Bidding documents for procurement, installation & commissioning and Operation & Maintenance of CAAQMS's at -------- (number(s)) locations, SPCB (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 out 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 JSPCB.

4. We agree to abide by this Bid for a period of One hundred twenty (120) days from the finaldate of the submission of Bid fixed in sub-clause 7.2 of the Instruction of Bidders, and shall remain biding 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, together with 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, andthat you will not defray any expense incurred by us in bidding.

Date this..... day of..... 2022.

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

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

Note:-

1. Contract price quoted for supply part shall be on for destination basis and shall include all cost e.g. custom duty, tr

No 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 IN RUPEES.

Item / Analyzer Name	Manufacturer	Country of Origin	Model	Quantity in Nos. /Sets	Unit Price in Rs.	TOTAL Price in Rs.
Automatic Ambient CO Analyzer						
Automatic Ambient SO2 Analyzer						
Automatic Ambient NO, NO2,and NOx Analyzer						
Automatic Ambient NH3 Analyzer						
Automatic Ambient O3 Analyzer						
PM10 Monitor						
PM2.5 Monitor						
Ambient BTX Analyser						
Black Carbon Monitor/analyzer						
Multi point Gas calibration system						
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						
Work Station Computer at stations with Data Acquisition System (for AQI Preparation)						
Rack Server - Computer (For Central Station at HO)						
Manageable CISCO Switch (Rack Mountable)						
42 U Industrial Rack (For Central Station)						
Access Point (AP) (For Central Station)						
Unified Threat Management (UTM) device (For Central Station)						
Display board with data transmission device, day light, and night visible data display system						
Housing/Container for Continuous Ambient Air Quality Monitoring (CAAQM) Station including sampling system, internal fittings, instrument racks, electrical and gas line fittings, tools (electrical & mechanical), etc.						

Online UPS 10 KVA, capacity (Three Phase I/P and Single Phase O/P, with 02 hrs. backup) (for Air Conditioner)						
Online UPS 5 kVA, capacity (Single Phase I/P & Single phase O/P, with 02hrs backup)						
Split Air Conditioner (2 Ton Capacity)						
Split Air Conditioners (1 Ton capacity)						
Sampling System						
19" Rack cabinet to accommodate all analyzers & systems						
RCC foundation, Pillars, misc. works including Civil & Electrical work						
TOTAL Indian Rs.						**₹ 0**

*** GST/Taxes shall be extra as applicable on the above Supply.**

ATTACHMENT 3A

BID PRICE BREAKUP FOR O&M OF CAAQM STATIONS FOR FIVE YEARS

Sl. No.	**Year of O&M**	**Total Charges for the year in Rs.**
		(in Rs.)
1	1st year	
2	2nd year	
3	3rd year	
4	4th year	
5	5th year	
TOTAL		

NOTE: GST/ Taxes shall be payable extra by the corporation.

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SECTION V

GENERAL CONDITIONS OF CONTRACT

SECTION V

GENERAL CONDITION OF CONTRACT CONTENTS

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.

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 theContract shall not affect their meaning.

"The **Project"** or "The Works" means supply, installation & commissioning of equipments for Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and their Operation & Maintenance at defined locations under the supervision and control of **JSPCB.**

"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.

"The **Contract Price"** means the price payable to the Contractor under the Contract for thefull and proper performance of its contractual obligations for the Works.

"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.

"GCC" means the General Conditions of Contract contained in this Section.

"SCC" means the Special Conditions of Contract in Section VI of this Volume.

"S/W" means the Scope of Works in Section II of this Volume.

"The **Contractor"** means the firm supplying the Equipment and-performing the Works in connection with the Project under the Contract and includes his personal representatives, successors and authorized assignees.

"The **Manufacturers"** means the firms which produce the Equipment to be furnished by the Contractor under the Contract with the JSPCB.

"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 JSPCB through the Consultant in case of prior to the Contract and agreed upon by both the JSPCB and the Contractor after the Contract.

"The **Sites**" means CAAQMS's as specified in Clause 1 of Scope of Works (Section – II).

INTENT OF CONTRACT

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.

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 JSPCB and Contract to be concluded between the JSPCB and the Contractor.

Unless otherwise agreed or stated, the Contractor shall bear all the cost and take all responsibility for the performance of all the Works.

USE OF CONTRACT DOCUMENTS AND INFORMATION

The Contractor shall not, without the JSPCB'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 JSPCB, Consultant 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.

The Contractor shall not, without JSPCB's prior written consent, make use of any documents or information enumerated here above except for purposes of performing the Contract.

Any documents other than the Contract itself, enumerated in here above shall remain the property of the JSPCB and shall be returned to the JSPCB on completion of the Contractor's performance under the Contract if so, required by the JSPCB.

5.0 LOCATION

As defined by the Authority as per list attached

LANGUAGE AND CALENDAR

Language

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

Calendar

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

SITE CONDITION

Site Condition

The Contractor shall study the existing Site Conditions, referring to the Bidding Documents carefully in order to familiarize themselves with the Works. The Contractor should ascertain all particulars of the location and Site conditions at their own expenses.

Access to Site

The Authority will give the Contractor access the Sites in order to perform the Works during the period of validity of the Contract unless otherwise provided.

COUNTRY OF ORIGIN

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

For the purposes of this Clause, "Origin" means the place where the Equipment were produced or manufactured. The Equipment is produced or manufactured when, though 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.

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

SPECIFICATION OF EQUIPMENT

Equipment

The Contractor shall supply all the Equipment specified in the package quoted as per the package wise Equipment List of Attachment 1 of S/W.

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

Specification of Equipment

The performance, materials, duty, workmanship, operating conditions and design conditions for the Equipment shall meet and comply with the 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. CODE AND STANDARD

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.

- 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

Metric System

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

ELECTRICAL RATINGS

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 ±10 volts AC and 50 Hz ± 3% unless otherwise specified in the Specifications.

2) Electrical plugs for the Equipment shall conform to local regulations and standards.

Precaution against Voltage Fluctuation

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 that electrical voltage fluctuation exerts a serious influence and damage upon functioning of the equipment.

12.0 NAME PLATE

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

PACKING AND MARKING

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 they are carried to the Sites in complete condition. The packages shall bemade 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. These Equipment shall be transported by container vessel and packed separately for the designated Site.

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 resistance to external influences.

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 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. Packing list shall be placed in a waterproof cover and secured against any external influence of the package.

SHIPMENT

Shipment

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

Shipping Documents

Promptly after shipment of equipment of foreign origin, the Contractor shall airmail the shipping documents to the JSPCB in accordance with SCC.

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 contractor will obtain statutory clearances for the same.

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 JSPCB'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 Authority for temporary occupation and protect facilities against any damages. Charges payable for this facility to the JSPCB for this shall be fixed by the Authority.

15.0 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 JSPCB 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 Authority.

16.0 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 schedulespecified here above.

PROJECT FORMATION

Authority/JSPCB

The authorized personnel of the for the Project who is responsible for any coordination with the Contractor is:

MS, JSPCB or Authorized Representative,

Any correspondence to or authorization from the Authority shall be made with the MS, JSPCB here above.

WARRANTY / O & M CONTRACT

All the CAAQMS's shall be under O&M Contract from the date of commissioning of the CAAQMS's. The details 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.

However the Contractor shall warrant to the JSPCB that the Equipment to be supplied underthe 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 from the date of commissioning.

The Contractor shall further warrant to the Authority 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.

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 stations by the Contractor.

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, therepair of replacement of the defective Equipment or improper parts thereof is carried out atthe 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 Authority in respect of repair thereof.

Manufacturer's Warranty

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

19.0 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, O&M, and training involved with the Works naming the JSPCB as the beneficiary, in the manner specified in the SCC, until issuance of taking over certificate.

INSTALLATION,

All the Equipment shall be installed and brought into suitable conditions for operation by the Contractor at the Sites designated by the Authority. 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 Scope of Work 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.

Only the best installation practices are to be applied, and all the installation works must be done to the satisfaction of the JSPCB and the Contractor shall carry out his

works in a neat and proper workmanlike manner. The installation shall be planned and carried out in no way to damage installation materials and the Equipment.

All the installing Equipment, tools, materials, labour, logistics and all the other requirements for installation shall be provided by the Contractor.

Prior to the establishment of Equipment layout and installation plan, the Contractor shall verify, check and inspect the designs and specific site conditions of monitoring stations andlaboratories where the Equipment are to be installed so as to make good arrangement for installation and utility assembly in consultation with the Authority.

INSPECTION AND TEST

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

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 Consultant for the inspections and test at no charge to the JSPCB.

Should any inspected or tested Equipment fail to conform to the Specifications, the JSPCB 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 JSPCB.

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 JSPCB 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 ofcontainer, NIST traceability for gas Aluminum cylinders
- Certificate of Traceability
- Verification of System Completeness
- Product Certificate

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

The Authority's right to inspect, test and, where necessary, reject the Equipment after the Equipment's arrival in India shall in no way limited or waived by reason of the Equipment having previously been inspected, tested and passed by the Authority 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 Inspectionand 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 MS, JSPCB. The equipment shall be inspected 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 an agency / expert appointed by MS, JSPCB. Such agency 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 chaired by MS, JSPCB, with experts members to be constituted by Authority will inspect and make recommendation on the specification for acceptance.

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 andnumbers 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 equipments. 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 acceptance committee 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 ofsupply.

TRAINING

The Contractor shall provide the Authority staff with the training as specified in Clause 5 of S/W for the Equipment & Technical Specification as a part of project cost.

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

COMPLETION

The Contractor shall complete all the Works by the date as specified in SCC.

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 CAAQMS for the period specified in S.C.C., the Contractor shall notify the Authority in writing that all the Worksunder 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 Authority will take over the stations or make alternate arrangement for their O&M.

24.0 SUBMISSION OF DOCUMENTS

The Contractor shall submit the documents specified in SCC to the Authority. 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 Authority.

PAYMENT

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 Authority in writing, accompanied by documents specified in SCC.

The payment shall be made promptly by the Authority but in no case not later than thirty (30) days after submission of invoice or claim by the contractor.

Currency of Payment

The currency in which payment is made to the Contractor under this Contract shall be specified in SCC.

26.0 PRICES

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

PERFORMANCE SECURITY

Performance Security

The Contractor within thirty (30) days from the date of notification of award shall furnish a Bank Guarantee from a reputed Indian schedule , Foreign or Nationalized Commercial Bank having license to do business in India to the JSPCB in line with the enclosed from as per Attachment 1 Section VI towards performance guarantee for an amount equal to three (3%) 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.

The Contractor shall ensure that Contract Performance Security remains valid at one year after commissioning of entire system satisfactorily.

Return of Performance Security

The performance security will be discharged by the JSPCB and returned to the Contractor not later that 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.

28.0 ASSIGNMENT

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

SUBCONTRACTORS

The Contractor shall notify the Authority 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.

DELAYS IN THE CONTRACTOR'S PERFORMANCE

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.

Notification of Delay

If at any time during performance of the Contract, the Contractor and/or the Manufacturers should encounter conditions impending timely delivery of the

Equipment and performance of the Works, the **Contractor shall promptly notify the JSPCB 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 JSPCB 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 JSPCB by amendment of the Contract.

Liability of Liquidated Damages

Except as provided under Clause 31 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 32 hereunder, unless an extension of time is agreed upon pursuant to Sub-clause 32 here above without the application of liquidated damages.

31.0 LIQUIDATED DAMAGES

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

32.0 SUSPENSION OF WORK

The Contractor shall not suspend the whole or any part of the Works without notice to the Authority in writing and the notice issued by contractor must specify the time for suspension of work. 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.

TERMINATION FOR DEFAULT

Termination for Default

The Authority, without prejudice to any other remedy for breach of Contract, by written noticeof 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 Authority pursuant to Clause 32 of GCC

or

2) If the Contractor fails to perform any other obligations under the Contract.

Liability for Excess Cost for Unperformed Work

In the event the JSPCB terminates the Contract in whole or in part pursuant to Sub-

clause 33.1 here above the Authority 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 Authority for any excess costs for such similar equipment / works.** However, the Contractor shall continue performance of the Contract to the extent not terminated.

FORCE MAJEURE

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.

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. Suchevents may include, but are not restricted to, acts of the JSPCB in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

If a Force Majeure situation arises, the Contractor shall promptly notify the JSPCB in writing of such condition and the cause thereof. Unless otherwise directed by the JSPCB 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.

35.0 TERMINATION FOR INSOLVENCY

The JSPCB at any time may terminate 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 Authority.

RESOLUTION OF DISPUTES

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 Engineer.

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 in connection 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 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).

In case of a dispute with a Foreign Contractor, the dispute shall be settled in accordance with provision of UNCITRL (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 Sub-Clause (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 New Delhi, 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).

TAXES AND DUTIES

a) GST will be paid by Authority based on the actual bills presented as documentary evidence.

b) GST (Good & Service Tax) will be as applicable as per taxation rules on incidental services like Installation, Commissioning and training and O&M service etc. and shall be payable in addition by the Authority.

INJURY AND DAMAGE

Injury or Death of Persons

The Contractor during course of business activity shall be liable for and shall indemnify the Authority and their officials against any liability, loss claim or proceedings whatsoever arising under any statue 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 Authority, or of any person for whom the Authority is responsible.

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

Damage to Property

The Contractor shall be liable for and will indemnify the Authority against and insure and cause any Manufacturers and subcontractors to insure against any expenses, liability, loss claim or proceedings in respect of any damages whatsoever to any real or personal property for any one occurrence in so far as such damages 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.

ROYALTY AND PATENTS

The Contractor is liable to 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 hold harmless the JSPCB and their officials 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 JSPCB, defend the JSPCB against any suit brought to enforce any such claim at the Contractors expense.

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 JSPCB the right to continue using the said item by suspension of the enjoinment, by procuring for the JSPCB 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 JSPCB's approval remove the said enjoined item and refund to the JSPCB the sums paid thereof.

40.0 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.

41.0 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 JSPCB and their representatives from any claim, loss or damage arising from any non-compliance alleged or proved, without claiming them for payment.

42 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 CONDITIONSOF CONTRACT

SECTION VI

SPECIAL CONDITIONS OF CONTRACT

CONTENTS

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 isindicated 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.

CONSUMABLES AND SPARE PARTS

Supply of Consumables and Spare Parts

The Contractor shall provide the consumables and spare parts as per requirement of Operation & maintenance of CAAQMS Stations.

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. 5 of Section III.

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.

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.

2) Name of the Works. Supply and O&M of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) for JSPCB at locations specified

3) Name of the Project: Supply and O&M of Continuous Ambient Air QualityMonitoring Station (CAAQMS) for JSPCB

4) Contract number:
5) Contractors name:
6) Port or airport of discharge:
7) Country of origin:
8) Item, and if applicable, package number in sequence, and quantity per package and/or Equipment:
9) Description of Equipment:
10) Net and gross weight and cubic measurement:
11) Shipper's name and/or marks:
12) Caution marks, if applicable:
13) Other markings required by the JSPCB:
14)

SHIPMENT (GCC CLAUSE 14)

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

Notification and Submission of Documents

Upon shipment, the Contractor shall notify the Authority and the Insurance Company by cableof 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 ofarrival

6) Invoice amount of shipment

7) Name of a claim settling agency in India.

The Contractor shall mail the following documents to the Authority, with a copy to theInsurance 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 markedfreight prepaid and four copies of non-negotiable bill of landing.

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 Authority 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 are allowed.

(2) Equipment to be supplied from within India:

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

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 deliverynote, 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 JSPCB.
v) Insurance certificate
vi) Certificate of country of origin

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

WORKS SCHEDULE (GCC CLAUSE 16)

Equipment to be supplied:

All the equipment shall be received at Mobile Continuous Ambient Air Quality Monitoring Station Site, within 180 days from the date of signing of contract agreement by both the parties and are to be installed and commissioned within Ninety (90) days from date of receipt at site.

Commissioning and others incidental services:

All the equipment in the awarded package shall be commissioned within 270 days after the date of signing of contract agreement by both the parties, including all the incidental services i.e. training etc.

O&M Contract

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

WARRANTY / O & M CONTRACT (GCC CLAUSE 18)

Period of O&M Contract

The complete CAAQMS 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.

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 Authority on "All Risks" basis, including war risks and strikes, namingthe Authority 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 stations depreciated annually as per standard norms.

9.0 INSTALLATION (GCC CLAUSE 20)

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

INSPECTION AND TEST (GCC CLAUSE 21)

Unpacking Inspection

An unpacking inspection shall be performed by the Contractor to inspect whether all the itemsand 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 Authority.

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 Authority shall be promptly remedied by the contractor. The Contractor shall submit the site inspection report to the Authority and the Consultant.

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 Clause 4 of Scope of Works 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 JSPCB same shall be promptly reminded by the Contractor.

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

The Contractor submits the performance test report to the Authority.

11.0 COMPLETION (GCC CLAUSE 23)

The Contractor shall complete all the Works up to installation and commissioning of CAAQMS's within 270 days after the date of signing of contract agreement by both the parties.

SUBMISSION OF DOCUMENTS (GCC CLAUSE 24)

Work Program

Within thirty (30) days from the notification of award of the Contract, the Contractor shall submit the detailed Works program and schedule to the JSPCB 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 inthe Techno-commercial Bid
d. Program for factory, pre-shipment, unpacking and site inspections and performancetest
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.

Other Documents

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

Item	Number of Documentsto be sent to Authority
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:

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

PAYMENT (GCC CLAUSE 25)

Method of Payment

The payment shall be made in the currency specified in the contract by means of Cheque/NEFT/RTGS/IMPS for equipment against receipt of material at site.

Terms and Conditions of Payment

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

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

i) **On Delivery:** Eighty (80)% of the contract price in INR shall be through Cheque/NEFT/RTGS/IMPS for equipment against receipt of material at site along with documents as specified in Clause 5.2 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 Authority) of all the Equipment of the particular package at specified siteand submission of acceptance certificate as per Attachment 3 of SCC.

(b) 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 required air quality report as per annexure X_1 to X_5 along with data obtained from calibration documentation. Any penalties applicable if any as referred in Scope of Work for O&M Contract and as per notification of award of contract shall be deducted from the quarterly payment.

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 Authority.

PERFORMANCE SECURITY (GCC CLAUSE 27)

Performance Security

The amount of performance security as a percentage of the Contract Price shall be three (3) percent as per latest GOI Notification.

Performance Security is to be furnished by a specified date (generally 30 (thirty) days after notification of the award) and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations.

The Performance Security will be forfeited and credited to the Purchaser's account

in the event of a breach of contract by the contractor. It should be refunded to the contractor without interest, after he duly performs and completes the contract in all respects but not later than 60(sixty) days of completion of all such obligations including the warranty under the contract. Return of Bid/Performance Securities should be monitored by the senior officers and delays should be avoided. If feasible, the details of these securities may be listed in the e-Procurement portal, to make the process transparent and visible.

In case of purchase of capital goods equipment, there is usually a defect liability/warrantyclause against defects arising from design, material, workmanship or any omission on part of the vendor/ contractor during a specified period of months from the date of commissioning or from the date of dispatch in case of goods – whichever is earlier. In such cases, the Performance Guarantee is to be valid upto 60 (sixty) days beyond the warranty period. It is normally permissible in such a situation to allow Performance Guarantee to be valid upto 60 (sixty) days beyond delivery/ commissioning period and the contractor may be allowed to submit a fresh Bank Guarantee of 10 (ten) per cent of the value of the goods in the currency of the contract valid upto 60 (sixty) days beyond the Warranty period. In such cases, the Performance Guarantee is to be returned only after satisfactory delivery/commissioning and receipt of such a Bank Guarantee.

LIQUIDATED DAMAGES (GCC CLAUSE 31)
Rate

The Contractor shall pay to the JSPCB 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 ofeach station after scheduled date of commissioning.

Maximum Deduction

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

In addition to the 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 (Scopeof 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:

MS, JSPCB

Attachment 1

Form of Bank Guarantee for Performance Security (For Main Equipment)
(to be stamped in accordance with Stamp Act, if any, of the Country of the issuing Bank)

Bank Guarantee No. ---------

Date : .....

Ref. No.:.....

To,

MS, JSPCB,

……

Dear Sirs

THIS AGREEMENT is made on the ----------days of---------- 2021 ------
Between [Name of the Bank] of ---------- [address of the bank]
(hereinafter called "the Guarantor") of the one part and ..... (hereinafter called "the JSPCB") 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 JSPCB 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 Station (CAAQMS) for Authority 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 Authority as follows;

(a) If the Contractor (unless relieved from the performance by any clause of the Contract or bystatute 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 JSPCB the aggregate sum of ----------[amount of Guarantee shall be three (3)% (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 Authority 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 JSPCB, 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 other wise, any notice to the Guarantor of any such arrangement, alteration, or forbearance is hereby expressly waived.

This guarantee shall be valid for one year after successful commissions of entire system from thedate of expiry of O&M period 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 CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS (CAAQMS)

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

……., India which term shall include permitted assigns and successors (Hereinaftercalled as "The Authority" 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 Contractorvide 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 itsletter 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 supplying and operation & maintenance of Air Monitoring Stations and the owner has engaged the Contractor to supply and perform operation and maintenance of said Air monitoring stations 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 thisAgreement, viz.:

   i) Scope of Works;

   ii) Financial Bid;

   iii) Technical Specifications;

   iv) General Conditions of Contract;

   v) Special Conditions of Contract; and

   vi) The Authority'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 Stations 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 listedabove.

3. In consideration of the payments to be made by the JSPCB to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the JSPCB to perform the Works and to remedy defects therein conformity in all respects with the provisions of the Contract.

4. The JSPCB 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 thecontrary, notice to the JSPCB shall be properly addressed to:

   MS, JSPCB,
   ……..

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 Authority's
Authorized
Representative

Signature of Contractor

Signed, Sealed and Delivered by the said

(For the JSPCB) 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 Authority AFTER SUCCESSFUL COMMISSIONING OF EQUIPMENT

No.: Date: ……..

M/s

Subject: 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 theplant.

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 underPara No. 2.
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

Annexure – X_1

MONTHLY FIELD CHECK LIST OF (To be filled by Authority officials deputed) CAAQM STATION UNDER OPERATION CONTRACT (name of the city)

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

…… Signature of JSPCB official

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
Report No. :
Monitoring Location :
Data Interval: 1 Hr. Average

Station Name:----------

Month:----------

Date:---------- --.

Monitoring Conducted By:----------

Hrs.	NO	NO_2	NO_X	NH_3	SO_2	CO	O_3	$PM_{2.5}$	PM_{10}	Benzene	Toluene	Ethyl Ben	MP Xylene	O xylene
	µg/m^3	µg/m^3	ppb	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
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_2	NO_X	NH_3	SO_2	CO	O_3	$PM_{2.5}$	PM_{10}	Benzene	Toluene	Ethyl Ben	MP Xylene	O xylene
	µg/m3	µg/m3	ppb	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
19-20 Hr.														
20-21 Hr.														
21-22 Hr.														
22-23 Hr.														
23-00 Hr.														
00-01 Hr.														
01-02Hr.														
02-03 Hr.														
03-04Hr.														
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_2*	*NO_X*	*NH_3*	*SO_2*	*CO*	*O_3*	*$PM_{2.5}$*	*PM_{10}*	*Benzene*	*Toluene*	*Ethyl Ben*	*MP Xylene*	*O xylene*
	µg/m³	*µg/m³*	*ppb*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*	*µg/m³*
January														
February														
March														
April														
May														
June														
July														
August														
September														
October														
November														
December														
MINIMUM														
MAXIMUM														
AVERAGE														

Calculation of City-wise Payment for O & M Charges on Quarterly Basis for CAAQM Stations 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 ……							`
Total Amount							`
Name of the Station		**STATION I (Location …….)**		**STATION II (Location……)**		**STATION III (Location ……)**	
Quarter No.:							
Duration:							
Year:							
Percentage of valid monthly data captured rate	Month 1						
	Month 2						
	Month 3						
Average Quarterly Data Captured Rate							
		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
Base Amount per Quarter (as per NoA)**(A)**							
Proportionate Amount based on Valid Data Captured Rate**(B)** Formula: see at footnote* (Specimen Calculation sheet attached in **Annexure I)**							
Applicable Deduction as per penalty provision for continuousnon-functioning**(C)** (Specimen Calculation sheet attached in **Annexure II)**							
Any Other Deduction, specify with justification**(D)**							
Applicable Taxes &Duties**(E)** - Service Tax - Education Cess - Secondary &Higher Education Cess - CST							
Net Amount Payable (`)**[F = B- (C+D) +E]**							
Total O&M cost Payable(Station Wise)		**(i)**		**(ii)**		**(iii)**	
Total Amount Payable (`) for O& M cost for City for quarter no. 1/2/3/4 of year 2013 (I + ii + iii)							

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

Annexure I (Ref.: Invoice no-------dated---------for the period ---------

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

Total Penalty Amount (`):

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

**** Grace period of 7 days is applicable only once per quarter**

Annexure II

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

Name of Station*	**Observed Monthly Data Captured Rate**														Average Percentage DataCapture Rate
	For gases pollutant						Dust Particles		For Mat. Parameters						
	NO_2	O_3	SO_2	CO	NH_3	BTX	$PM_{2.5}$	PM_{10}	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

Annexure-I

VOL-II

TECHNICAL SPECIFICATIONS FOR MOBILE CONTINUOUS REAL TIME AMBIENTAIR QUALITY MONITORING VAN

SCHEDULE OF REQUIREMENTS

The equipments are intended for one Continuous Ambient Air Quality Monitoring Station (CAAQMS). 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_2) Analyzer	One
3.	Continuous Ambient Oxides of Nitrogen ($NO/NO_2/NOx$) Analyzer	One
4.	Continuous Ambient Ammonia (NH_3) Analyzer	One
5.	Continuous Ambient Ozone (O_3) Analyzer	One
6.	Continuous BTX Monitor/Analyzer	One
7.	Automatic PM_{10} Particulate Matter Monitor	One
8.	Automatic $PM_{2.5}$ Particulate Matter Monitor	One
9.	Black Carbon (BC) Monitor	One
10.	19" rack cabinet to accommodate all Analyzers & Systems	One Set
11.	Sampling system having 10 port manifolds	One
12	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 Set
13	Multi-calibration systems for Gas Calibration and Meteorological,Flow and Electronic Calibration	One Set
14.	Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank- up Meteorological Tower.	One Set
15.	Computer system consisting of one PC along *Color 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 Set
16.	Vehicle model number TATA 1616 LPT OR equivalent along with vehicle frame (Chassis build up) air conditioned and thermally stable instrument cabin.	One Set
17.	Air Conditioner, Split Type, Roof Mounted along with voltage stabiliser (1.5x1.5 ton)	2 Units
18.	Online UPS (1x5 KVA, 2 **Hours** backup)	One Set
19.	5 KVA Petrol Generator	0ne

TECHNICAL SPECIFICATIONS

MONITORING VAN

Chassis Van Specification

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	G550(6F,1R), Cable Shift Mechanism
Fuel tank capacity (in litres)	160 Ltrs
Battery	12 V - 100 ah
Ground Clearance	225 mm
Wheel Base	4920 mm
Cargo Body Length	22 ft
Cargo Body Width	7.6 ft

Specification of the Vehicle: Heavy Duty Vehicle with chassis (conformed to latest BS norms) registerable and useable in State and also anywhere in State as per existing MV rules from Indian manufacturers suitable to fabricate Continuous Automatic Air Quality Monitoring (CAAQM) container shall be provided. The mobile station shall be equipped with SO2, NO-NOx, NH3, CO, O3, PM10, PM2.5, BTEX, and Meteorological Equipment, data logger, multipoint calibrator, Air conditioners, UPS, etc, as required for a completely self-contained mobile air pollution monitoring station. Vehicle should be equipped with GPS tracker.

The Mobile chassis shall have the necessary accessories for fitting CAAQMS with the adequate suspension to minimize the impact on the instruments while driving the vehicle. The van shall be equipped with a connection from the Grid supply in addition to one number of 10 KVA petrol generator and accordingly, 30-meter cable drum shall be provided, so that cable can be drawn and connected to the mains electrical supply based on the actual site conditions. The unit should be planned in such a manner that it can be operated either in DC or AC power.

Mobile van shall have compartments of air conditioning environment for mounting of analyzers, equipments, non- air conditioning compartments for storing calibration gases and Batteries. The driver cabin shall be the vehicle supplier's standard design. Necessary nos. of the entrance as per the requirement shall be provided in the mobile van.

The outer shell of the van shall be with outer layer of 1.2 mm MS/GI sheets, minimum thickness 1.2 mm and inner layer of Anodized Aluminum / MS sheets, minimum thickness 1.2 mm painted material with full rain, sun and environment protection. The PUF insulation shall be provided between inner and outer layer. The thickness of the insulation shall be 40 mm as minimum.

The painting on the interior and exterior wall shall be done as per the JSPCB requirement. JSPCB will provide details on the color and artistic works to be done on the mobile van during the painting.

Monitoring Container is designed for housing the ambient air quality monitoring instruments to protect them from dust and heat. Temperature and Humidity sensors shall be installed in the housing for checking the humidity and temperature inside the station. The necessary number of 19" racks shall be installed inside the container so that the analyzers are easily accessible from front & back for calibration and maintenance. All other infrastructure work for setting up the stations viz., flooring mat, paneling, internal wiring for Air conditioning, Inverter, and UPS shall be provided by the contractor.

Mobile Laboratory Furnishing:

(i) 19" racks – 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 acommon 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.

AIR CONDITIONER

Type: 2 Nos. split type, wall mounted Inverter Compressor Split AC with a minimum 3 Star rating shall be installed with an automatic timer. A separate Voltage stabilizer will

be provided with each unit.

Capacity: 1.5 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 25^0 Cinside during peak summer months.

Cooling capacity: 5000 W

Fan type: Propeller Fan

Fan Motor type: Permanent Split Capacitor, 1/8 Horsepower

Control Type: Remote

Compressor: Reciprocating

Refrigerant: Eco Friendly

Power supply: 230 volts±10 volts AC and 50 Hz±3%.

ON LINE UNINTERRUPTED POWER SUPPLY (UPS)

Single phase 5 kVA UPS along with Automatic Delayed Restoration Device (ADRD) with2 hours backup in full capacity should be provided for the smooth operation of Analyzers and peripherals at the station:

3.2.1	Capacity		:	10.0 kVA
3.2.2	Technology		:	PWM using IGBT / MOSFETS
3.2.3	Crest Factor		:	More than 3: 1
3.2.4	Input	Voltage	:	230 V AC
		Voltage Range	:	± 25%
		Frequency	:	50 Hz ± 3%
3.2.5	Output	Voltage	:	415 V AC
		Voltage regulation	:	± 1%
		Frequency	:	50 Hz
		Frequency regulation	:	± 0.01%
		Waveform	:	Pure sine wave
3.2.6	Battery	Battery type	:	Sealed maintenance free
		Back up time	:	2 Hours at full load
		Battery Capacity	:	For required backup time
		Recharge time	:	5 hrs to 90% after completing discharge
3.2.7	Distortion		:	Less than 1% on linear load
3.2.8	Power factor		:	0.9 to 1
3.2.9	Indicator		:	L.E.D. – Battery Charge, Load level, online, over load, on battery, replace battery
3.2.10	Alarm		:	Audible alarm for battery backup, battery low and fault
3.2.11	Protections	Surge	:	Surge suppression meets BIS or International standard
		Overload	:	Fuse & current limited
		Short circuit	:	Fuse & current limited & cut – off

		Battery low cut – off	:	No battery drains after cut - off
3.2.12	Overload Capacity		:	110% for continuous load
3.2.13	Efficiency		:	More than 90%
3.2.14	Environment	Operating Temperature	:	0 – 50^0 C
		Operating Humidity	:	10% to 95% (Non-condensing)
		Audible Noise	:	Less than 45 db (at 1 meter)
3.1.15	Isolation transformer		:	Double conversion fully isolated architecture

AIR QUALITY ANALYSIS SYSTEM

(CO, SO_2, NO_x, NH_3, BTEX, PM_{10}, $PM_{2.5,}$ O_3 Analysers)

Technical specifications of all the equipments must be in compliance of Central Pollution Control Board and/or USEPA certified.

(General Specifications for all Analysers)

The analysers should be 19" rack mounting model with facilities for fixing the analysers from front side.

The display of the entire important status signal viz. Sample flow, temperature, concentration, range switch, manual / auto mode, zero / span mode should be on front panel.

The analyzers should operate at operating voltage 230 volts ±10 volts AC and 50 Hz ±3%. The power supply input to be protected against spikes from and to the analyser by an LC filter. The power connection cable should be CEE type complete with 15 Amperes plug adaptable to Indian mains socket.

The analyzers must have Analog, RS232 and USB ports with the option to add a TCP/IP port.

An electronic adaptive filter for continuously optimised response time and measurement stability must be used by the gas analysers

The analyzers must have removable 4GB data storage as a minimum and be capable of storing in excess of 8 years of 5-minute averages.

The analyzers must have 3 x analogue inputs with 160 uV resolution for connection of external sensors such as wind speed and direction, relative humidity and temperature sensors.

A dual filter design must be used by the gas analysers in order to minimize maintenance.

The ON / OFF switch analyzers lay of the entire important status signal viz. Sample flow, temperature, concentration, range switch, manual / auto mode, zero / span mode should be on front panel.

The analysers must function properly in Indian conditions without any defect between 0 – 50^o C ambient temperature, 10 – 95% relative humidity and in high ambient dust levels. The data capture rate should not be less than 90%.

The Manufacturer shall provide minimum of 2 weeks of operational & preventive maintenance hands-on training for 3 persons (maximum).

The analysers should be complete with calibration system. The calibration system should be delivered along-with respective span gas cylinder. The span gas concentration should bewithin 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.

Gas analysers must have Bluetooth connectivity and a suitable Android App must be available for direct communication to these analysers.

Gas analysers must use a tactile number pad on the front screen, touch screens must not be used.

Gas analysers must provide an instant display of operational status using illuminated traffic lights (green, orange, red) on the front panel.

Gas analysers must have comprehensive data logging and remote viewing of over 200 operational parameters.

The analyzers must have no internal AC line voltages present, only internal DC voltages are permitted for safety reasons.

Latest firmware updates must be easily installed using the USB flash memory drive.

A dual rack slide design, enabling easy access to internal particulate filters and easy removal of analysers from the rack cabinet.

The calibration gases provided with the system shall have Traceability to NIST.

The analysers shall be supplied with all ancillaries necessary for operation including external pump (if any) 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 analysers should be provided before solenoid valve to protect frequent chocking of solenoid valve.

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

All ambient gas analysers shall conform with the USEPA automated reference / TUV / EN or equivalent method designation as required by the specification for individual equipment / parameters. 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 analysers shall be micro – processor controlled with automatic calibration using an external dilution calibrator and calibration standards. All analysers and sensors 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.

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

Each set of analyzers shall be supplied with two copies of elaborate operation manuals comprising details in three parts:

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 / SPCB's; and

Parts (IV) Schematic diagram for possible repair & maintenance.

Digital Output:

a) Multi drop RS 232 port shared between Analyzers, Dust Monitor ($PM_{2.5}$ & PM_{10}), Meteorological Sensors and computer for data, status and control. Communication should have a USB port, TCP/IP Ethernet connection.

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 actual supply**.** 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, biweekly precision checks and linearity checks every six weeks. All analyzers shall undergo full calibration every six weeks. 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. A comprehensive AMC (Annual Maintenance Contract) of the mobile CAAQMS including four preventive maintenance visit on quarterly basis and two breakdown visit and also consumables which are not covered under AMC should be provided by the vendor for minimum 60 days in a year and if required, 30 days prior information will be made as per requirement.

Air Quality Data shall be submitted to the Buyer 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, minimums, maximums, standard deviations, total data captured and percent data capture. The Air Quality Report shall also include wind roses where wind speed and direction are measured.

Upon 24-hour notice from the Buyer, once per year, the supplier shall agree to submit to an audit of calibrations, conducted, using pre-approved US EPA methodologies, by a third party. The results of these audits shall be made immediately available to both the supplier and Buyer.

SPECIFICATIONS OF 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:

Height of the sampling system:	Approx. 1.0 meter above the roof
Roof entry cut out:	Stainless Steel
Conduit:	Stainless Steel
Inner sampling system:	Borosilicate glass
Sampling head:	Stainless Steel
Manifold:	10 port for tubes 6 x 1 mm, self- tightening

6.0 SPECIFICATIONS OF 19" RACK

Suitable 19" Rack cabinet to accommodate all analyzers, calibrators, zero air generators, datalogger 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 filling 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.

7.0 AMBIENT AIR QUALITY MONITOIRNG ANALYSERS

(A) AMBIENT OXIDES OF NITROGEN (NO-NO_2-NOx) ANALYSER Conformingto USEPA Automated Federal Reference Method (FRM) Designation

01.	Principle	:	Chemiluminescence
02.	Measurement	:	NO / NO_2 / NO_x in Ambient Air
03.	Display	:	Digital
04.	Ranges	:	Auto ranging 0-2000 PPB
05.	Minimum 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.	Response Time	:	40 seconds or earlier
10.	Linearity	:	<1% of full scale
11.	Calibration	:	Please see multi-calibration section (Sl. No. J) and also, calibration section in General Specifications (4.6 & 4.7).
12.	Output Signals or Analog Output	:	3 Analog output 0 – 1 V, 0 – 10 V, 0 – 20 mA or 4 – 20 mA
13.	Digital Output	:	Multi drop RS 232 port*/USB Port/ TCP/IP/ Ethernet*
14.	Consumables and spares	:	Recommended requirements of 5 years of Continuous operation along with the list of Items.

(B) AMBIENT AMMONIA ANALYSER (NH_3)

01.	Principle	Chemiluminescence NH_3 conversion to NO by oxidation. NO_2 also converted to NO. the difference obtained by measuring NO in output of two sample stream as equal to NH_3
02.	Measurement	Ammonia in Ambient Air
03.	Display	Digital
04.	Ranges	Auto ranging 0-1000 PPB
05.	Minimum 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_3/NO converter	Yes, with more than 540 degC
10.	Linearity	<1% of full scale
11.	Response time	180 second
12.	Calibration	Please see multi-calibration section (Sl. No. J) and also calibration section in General Specifications (4.6 &4.7).
13.	Rise / fall Time 95% of the final value	< 30 Sec
14.	Digital Output	Multi drop RS 232 port/USB Port/ TCP/IP Ethernet
15.	Analog Output	0 – 1 V, 0 – 10 V, 0 – 20 mA, 4 – 20 mA
16.	Consumables and spares	Recommended requirements of 5 years operation Along with the list of Items.

(C) AMBIENT SULPHUR DIOXIDE (SO_2) ANALYSER Conforming to USEPA Automated Federal Equivalent Method (FEM) Designation

01.	Principle	:	Pulsed UV Fluorescence
02.	Measurement	:	Sulphur Dioxide in Ambient Air
03.	Lower Detectable Limit	:	1 PPB
04.	Ranges	:	Auto ranging 0 - 500 PPB
05.	Display	:	Digital
06.	Noise Level	:	0.50 PPB or 1% of the reading
07.	Zero Drift	:	< 1 PPB / 24 Hrs. With automatic zero compensation
08.	Span Drift	:	< 1 PPB in 24 hours.
09.	Calibration	:	Please see multi-calibration section (Sl. No. J) and also calibration section in General Specifications (4.6 & 4.7).
10.	Precision	:	0.5 ppb or 1% reading whichever is greater
11.	Output Signals or Analog Output	:	3 Analog output 0 – 1 V, 0 – 10 V, 0 – 20 mA or 4 – 20 mA
12.	Digital Output	:	Multiple drop RS 232 port */USB Port/ TCP/IP/ Ethernet*
13.	Consumables and spares	:	Recommended requirements of 5 years of continuous operation along with the list of Items.

(D) AMBIENT OZONE (O_3) ANALYSER Conforming to USEPA Automated Federal Reference Method (FRM) Designation

01.	Principle	:	UV Photometric
02.	Measurement	:	Ozone in Ambient Air
03.	Display	:	Digital
04.	Range	:	Auto ranging 0 - 500 PPB
05.	Minimum Detectable Limit	:	1.0 PPB
06.	Noise	:	< 1.0 PPB
07.	Zero Drift	:	< ½% per month
08.	Span Drift	:	< 1% per month
09.	Calibration	:	With built in Zero and span generator and also see multi-calibration section (Sl. No. J)
10.	Linearity	:	Continuous + 1%
11.	Output Signals or Analog Output	:	3 Analog output 0 – 1 V, 0 – 10 V, 0 – 20 mA or 4 – 20 mA
12.	Digital Output	:	Multiple drop RS 232 port */USB Port/ TCP/IP /Ethernet*
13.	Consumables and spares	:	Recommended requirements of 5 years of continuous operation along with the list of Items.
14.	Response Time		30 seconds or less

(E) AMBIENT CARBON MONOXIDE (CO) ANALYSER Conforming to USEPA Automated Federal Reference Method (FRM) Designation

01.	Principle	:	Non-Dispersive Infra-Red (NDIR) with Gas Filter Correlation/Cross flow Modulation Method
02.	Measurement	:	Carbon Monoxide in Ambient Air
03.	Display	:	Digital
04.	Ranges	:	At least four ranges Auto ranging 0 - 100 PPM.
05.	Minimum Detectable Limit	:	0.1 PPM
06.	Zero Noise	:	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.	Calibration	:	Calibration gas (CO) cylinder – 15 liters capacity. A Highly polished aluminum cylinder portable filled with 40 PPM NIST traceable Calibration gas has to

			be provided along-with the instrument for calibration purpose. It should also have pressure gas valve for Zero and Span gas.
10.	Linearity	:	Continuous + 1%
11.	Output Signals or Analog Output	:	3 Analog output 0 – 1 V, 0 – 10 V, 0 – 20 mA or 4 – 20 mA
12.	Digital Output	:	Multiple drop RS 232 port /USB Port/ TCP/IP/ Ethernet
13.	Consumables and spares	:	Recommended requirements of 3 years of continuous operation along with the list of Items.

(F) PM_{10} 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.

1.	Principle	β- ray attenuation
2.	Particle Size Cut Off	0 - 10 Microns
3.	Measuring Range	0 to 1000 μ g/m^3
4.	Resolution	1% of the measurement range
5.	Minimum Detectable Limit	2 μg/m3
6.	Detector	Plastic Scintillator / GM Counter, Silicon Semiconductor Beta Detector
7.	Air Flow Rate	16.7 litres/minute adjustable 0 - 20 LPM range actual or standardized flow
8.	Filter Material	Glass Fiber Filter
9.	Display	LED / LCD
10.	Sampling Head	Dynamic heated sampling head for measurement of PM_{10}
11.	Calibration	Reference membrane facility should be provided for calibration of the analyser.
12.	Compatibility	Analyser should be compatible with protocols mentioned in DAS section
13.	Roll Length	Approximately 30 meters
14.	Measurement Result	1 hr average or shorter
15.	Approval	USEPA /TUV approved

(G) $PM_{2.5}$ 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.

1.	Principle	β- ray attenuation
2.	Particle Size Cut Off	0 – 2.5 Microns
3.	Measuring Range	0 to 1000 μ g/m^3
4.	Resolution	1% of the concentration
5.	Minimum Detectable Limit	2 μg/m3
6.	Detector	Plastic Scintillator / GM Counter, Silicon Semiconductor Beta Detector
7.	Air Flow Rate	16.7 litres/minute adjustable 0 - 20 LPM range actual or standardized flow
8.	Filter Material	Glass Fiber Filter
9.	Display	LED / LCD
10.	Sampling Head	Dynamic heated sampling head for measurement of PM_{10}
11.	Calibration	Reference membrane facility should be provided for calibration of analyzer.
12.	Compatibility	Analyzer should be compatible with protocols mentioned in DAS section
13.	Roll Length	Approximately 30 meters
14.	Measurement Result	1 hr average or shorter
15.	Approval	USEPA /TUV approved

(G) BTEX MONITOR / ANALYSER

1.0 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 ± 10 volts AC and 50 Hz±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 preferablyhaving 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

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 that a very short cycle (for benzene standard minimum 10 minutes). The system should be adapted to the specific hydrocarbon that must be monitored with regards to the essential parameters: column, flow, temperature and back flush setting. The OVEN should be isothermal.

The analyser should have minimum following technical specification.

S. No.	Description	Requirement
1.	SPECIFICATIONS	Detector: PID Levels: 0,15ppb to 0,03 ppm for benzene, Cycle time: 10 min minimum
2.	GAS CONSUMPTION	PID: Nitrogen, quality 5.0, 3.0 bar 20 ml/min
3.	RANGE	0 – 100 ppb for PID
4.	REPEATIBILITY	1% of FS
	HARDWARE AND COMMUNICATION OPTIONS	
5.	INCLUDED HARDWARE	Computer Pen-um class, hard disk >20Gb, 6" full colour LCD
6.	INCLUDED SOFTWARE	Windows Xp or further version, Embedded, GC Software
7.	COMMUNICATION	Direct control via touchscreen, keyboard or mouse. External data communication via RS232, analog and digital outputs, via TCP-IP.
8.	GC SPECIFICATIONS	Column cage with special application column, 10 port valve, Pre-concentration trap, detector PID
9.	CALIBRATION	Internal calibration switch for calibration zero and span gas, gas stream required 25 mL at ambient pressure
	PHYSICAL DATA	
10.	DIMENSIONS	19" rack, (W 48,3 cm) 3 standard Height Units, (high 13,9 cm) depth 37,2 cm Approx. Weight 12 kg
11.	POWER	220 V AC,
12.	CONDITIONS	5 TO 40ºC, 20 TO 95% Rh
13.	APPROVALS	CE approval for EMC conformity: QAL1 certificate EN 61000-6-2, EN 61000-6-3, EN 61010, EN 61326
14.	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.

(I) MULTICALIBRATION SYSTEM

Calibration system shall be of same make as that of gaseous analyzers and should providefor 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 analysers 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 analysers while minimising 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 SO2 in Nitrogen.

The dilution calibrator should have Ozone photometer to perform ozone calibrations of the ozone analysers 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 sequences.

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 O3 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 minimising 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 NO2 concentration to NO.

The system should also include calibration of Ozone analyzer.

SPECIFICATIONS	
Dilution Gas Inputs	1 standard 100 - 200 kPa (g) (2 optional)
Source Gas Inputs	4 standard 100 - 200 kPa (g) (8 optional)
Dilution Mass Flow Controller	10 SLPM, 0 Deg, 1 ATM (std), 1 SLPM, 2 SLPM, 5 SLPM or 20 SLPM (optional), 2nd MFC (optional)
Source Mass Flow Controller	50 SCCM, 0 Deg, 1 ATM (std), 10 SCCM, 20 SCCM, 100 SCCM, 500 SCCM or 1 SLPM, 2 SLPM (optional), 2nd MFC (optional)
Flow Accuracy (Constant Temp)	Within 1 % of full scale
Flow Repeatability	Within 0.15 % of full scale
Linearity	Within 0.15 % of full scale
Operating Gas Pressure	100 - 200 kPa
Zero Drift	< 0.6 % per year

Response Time	< 5 seconds
Output Manifold	4 output ports standard
Dilution Ratio	Variable 10:1 to 2000:1 (std configuration)

CASE DIMESIONS	
Rack length	597 mm (23.5”) (front to rear)
Rack Mount	19”
Total length (with latch release)	638 mm (25.1”)
Chassis width	418 mm (16.5”)
Front panel width	429 mm (16.9”)
Chassis height	163 mm / uses 4RU (6.4”)
Front panel height	175 mm (6.9”)
Weight	18.2 kg
POWER	
Operating Voltage	• 100 - 240 V VAC 50 / 60 Hz (autoranging)
Power Consumption	• 165 VA maximum (typical at start-up) 95 VA after warm-up
Operating Conditions Ambient Temperature Range	• 0 - 45°C (32 - 104°F), 20 - 35 °C for optimum performance
Pressure	• Maximum altitude: 3000 m above sea level
COMMUNICATION	
User Interface	• Via front panel keypad or computer
Programmable calibrations	•16 separate programmable sequences
	•32 separate programmable points Analog Input
Analog Input	•Three analog voltage inputs (0 - 5 VDC) CAT I rated
Digital Output	•RS232 port #1: Normal digital communication
	•RS232 port #2: Multidrop port used for multiple analyser connections on a single RS232
	•USB port connection on rear panel, Non-volatile protected, automatic start-up after power failure •25 pin connector with discrete status and user control •USB stick memory (front panel) for data logging, event logging and parameter storage •8 Digital Outputs, open collector max 400 mA each at 12 VDC (max total output 2A) •8 Digital Inputs, 0 - 5 VDC •CAT I rated •1 Diluent Control, + 12 V output

	•Four line illuminated display

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

a) 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: NOx, NO, NO2, O3, SO2, H2S, Less < 0.1 PPB
Size:	height: 230mmH (5RU) with rubber feet width: 482mm depth: 352mm

b) alibration 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 (SO2, NO, CO, NH3, Benzene & Toluene) along with SS regulator for the multipoint calibration. The synthetic air and N2 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.

c) 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.

8.0 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	:	10 sec or better

(b) WIND DIRECTION

Range	:	0 – 359 degree
Accuracy	:	± 5 degree or better
Resolution	:	1 degree
Sensor type	:	Ultrasonic
Threshold	:	0.5 m/sec or less
Response time	:	10 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
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^2 or better
Accuracy	:	± 5.0 % or better
Resolution	:	$5W/m^2$

(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 suitablesensor
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. ft) at 50 mph
Number of Sections	:	4
Construction material	:	Galvanized steel or aluminum

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, 10 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.

SPECIFICATION OF SOFTWARE FOR CAAQMS.

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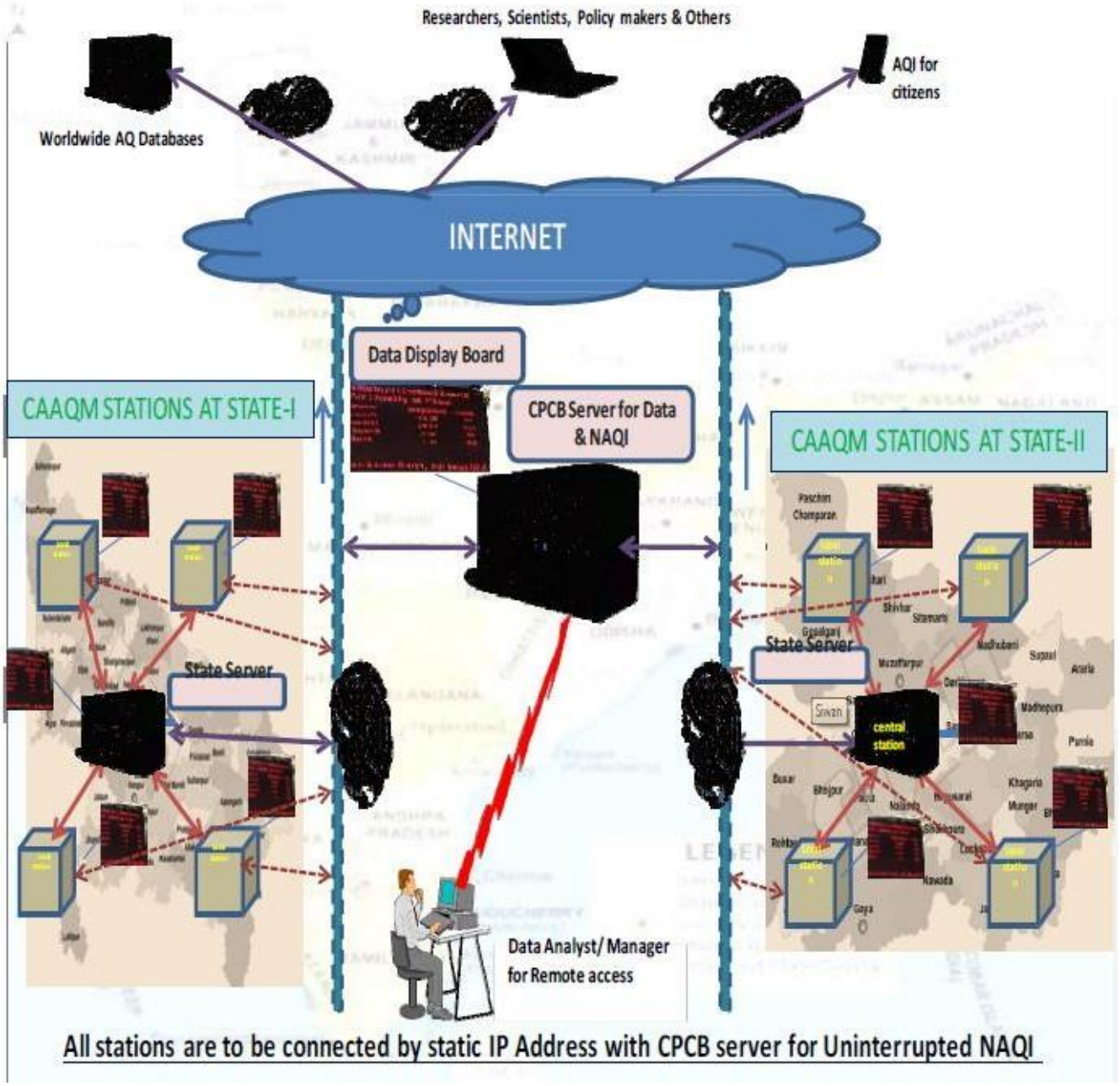
SPECIFICATION OF SOFTWARE FOR CAAQMS.

9.1 Typical Architecture for Data Connectivity



- This architecture defines data transmission from all connected CAAQM Stations to State Data Center and Central Data Centre in parallel through internet (leased lines) in real time basis.
- All Stations are to be connected by static IP address with CPCB Server (Central Data Server) for uninterrupted NAQI.
- There should also provision in the station itself for data display of Pollutants parameters, Meteorological parameters and NAQI on display system near to Station.
- Each CAAQM Stations measure their respective pollutant and meteorological parameters and get them stored in data logger before transmission.

- From Data logger, data transmits for data display, and also through internet the same data is transmitted to Central server as well as State server for data display at Central level and State level, parallelly.
- Data display system at all locations display Pollutant, Meteorological and NAQI data on real time basis of all connected CAAQM Stations.

Data Acquisition and Handling System at Station

A The Data logger must have following minimum features:

- Latest edition of Windows
- "Industry Standard" RS232 and USB Communication enables digital communication with supported monitoring equipment
- Supports remote communication providing full control over the pollution monitoring system and direct interfacing with gas analyzers.
- Remote communication through switched telephone, cellular telephone, ethernet and satellite telephone networks as well as short haul modems.
- Data storage for over thirty years of 10-minute historical data.
- Captures minimum, maximum, average values and standard deviations
- Lightning & surge protection facilities
- Full control over calibration cycle periods
- Data retrieval via internal DVD-RW in the event communication networks is unavailable.
- Have the facility to keep the records of all maintenance, calibration as per the requirement of ISO 17025 to fulfils the "traceability of records"
- Solid-state drive (SSD) reduces the risk of data loss from mechanical knocks

Remote Control

The data acquisition system must work on the Client/Server model. Each Data Acquisition System has both Server and Client Software installed. The Server handles all communication with the analyzers, calibrator and stores the data into multiple reports. The Client Software is the graphic interface enabling the user to setup the server, view both instantaneous and historical data and perform routine operations.

Calibration Control

Data logger must be designed to automatically provide calibration and control signals via direct RS232 interface with Dilution Calibrator. All calibration data must be flagged in order to separate it from measurement data. Calibration data is flagged and stored in separate data reports which include precision, zero and multiple span reports.

Data Pusher (Web site)

Data logger's Data Pusher must be able to directly FTP data to web servers and other applications without data needing to be downloaded first.

Specifications

CPU:	x86 compatible processor – 2.6 Ghz+
RAM:	GB.
Hard Drive Config:	Solid State 60 Gbytes
DVD-RW:	Used for installation of software and backing up of data/configuration files
Display Driver:	Supporting up to 2560 x 1600 dual screen
Modem:	56 kbyte or better.
Operating System:	Windows 11
Data Storage:	1 TB (SSD)

Data Storage Format:	Data Stored in ASCII format.
Data Averaging Periods:	Up to 4 independent data sets.
	Selectable between 1 minute and 7 days
Calibration control:	Automatic Span and Zero control. Calibration data is stored separately
Communication ports:	5 RS232 serial ports standard, (1 used for the modem) and network card. (Upgradeable to 34 RS232 ports)
	6 x USB2.1 Ports
Modem Port:	1 x RS232 DB9M
Mouse port:	USB port.
Operational Environment:	0 – 40°C
Power:	500 Watt power supply.
Size:	approx. 434x480x177 mm (WxDxH) rack mountable case.

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 PersonalComputer. 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 withinproject duration) to configure with the PC.
d) User configurable channels, stations and equipments 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^3 etc.
g) Software should be equipped to configure the analysers with it, irrespective of the output mode i.e. Analog or Digital (RS 232 port */ USB Port/ TCP/IP Ethernet*) 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 / 60 seconds.
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 fromthe 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
   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 ascertainthe 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 32 channels for a period of minimum five years.
d) Data stored should be plain text format
e) 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) In 4-in-4 graphs, 4-in-1 graph and / or 16-in-1 graph formats
b) In terms of 4-in-1 table format
c) Real time multi – graphs over user selectable time period.
d) Display of graphic & tabular display of the current data.
e) 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)
f) Tabular form should comprise of 4 channel list in user defined format i.e. 1, 5, 10, 15, 30min, 1hour, 4, 8, 24 hour, 30 days and yearly. (user definable time series)
g) Station instruments basic configuration etc. should be visible on screen continuously.
h) Main window for real time display of all measured parameters with status of all analyzers/sensors.
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 SPCB within a time frame.
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 (Air Quality Standards) for defined period for the databaseetc.
k) Data analysis of diagnostics parameters
l) Data analysis of Pre calibration and post calibration data (if facility not available can

be developed)

m) Data analysis of corrections applied of each calibration cycle (if facility not available can be developed)

5) Data Backup

a) There should be defined data backup procedure through which data can be extracted fromstation 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 stations be recorded

10) Data transfer to Central

All data captured at station computer should be transferred to central software of SPCB.

a) User selectable time frame for transmission of data to central server of SPCB.

b) Diagnostics (actual diagnostics parameter values recorded each time in the station), configurations (station channel configurations), alarms (generated alarms) should be transmitted.

11) Data transfer to Display Boards

The system provider is responsible to make necessary software provisions to connect output on display boards. The formats of files may vary, the formation of defined formats is the responsibility of system provider for the project duration.

a) Software should be capable to transfer and display online data on display board at the station location.
b) The data in user defined formats (customizable) should be made available for continuous display.

B DATA ACQUISITION SYSTEM AT THE CENTRAL STATION

SPECIFICATIONS OF CENTRAL SOFTWARE

Data communication system handles the data transmission of an ambient air quality network and receives incoming messages / signals from remote stations. The central software processes signals and data and displays it on the web and other interfaces. Detailed requirement is as below:

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 stations on - line data (momentary values) in tabular text and graphic format.
c) Data should be received by the central software of SPCB from all locations within 5minutes duration or at user defined time intervals.
d) Data along-with diagnostics and calibration details should be transmitted at central fromall 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 withoutadditional charges.
f) Should have the remote control facilities for calibrations (Zero & Span) of instruments andmeasuring 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
b) In terms of 4-in-1 table format

c) Real time multi – graphs over user selectable time period.
d) Display of graphic & tabular display of the current data like simple 3D line and columnchart, polar diagnostics and 3D perspective column chart.
e) 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)
f) Tabular form should comprise of 4 channel list in user defined format i.e. 1, 5, 10, 15, 30min, 1hour, 4, 8, 24 hour, 30 days and yearly. (user definable time series)
g) Display of data using selectable name of different stations.
h) Generation of Wind Roses, Pollution Roses (12 & 16 directional i.e. 0 degree,22.5, 45, 67.5, 90 and 360 degree) with user defined time limits.
i) Calculate vector mean of wind direction.
j) Programmable down loading of data.
k) Comparison of data w.r.t. Standards in Graphical form and tabular form with informationof values exceeds the Standards.
l) Specific data zooming facility
m) Database correction procedure
n) 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 IDand time.
o) Data validation trail recording.

3) Data Export

a) Customizable data format developing capability required.
b) 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

a) 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 thesame on central software.

5) Printing

a) 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

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 userof system failure and the recorded alarm should be transmitted to central software and stored. There should be provisions to read these alarms in a database for corrective actions and for comparison of data for acceptability or rejection.
b) 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.

7) Data validation requests management at central computer (if not available facility may be developed by the firm)

a) 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.

b) 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.

c) 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. 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.

7. **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 ona 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 stations parameters comparing hourly, 8 hourly, 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 *SPCB/* CPCB should be displayed on webpage.

i) The disclaimer have to be provided on the webpage

j) Some predefined queries have to be developed to display the data on web page. A search age needs to be developed for converting data into meaningful format for the general public. Help in developing such kind of systems can be taken from existing running system at www.cpcb.gov.in/caaqm and www.cpcb.gov.in/cpcbpa.

k) The current data displayed on the web should have comment inserting facility at individual data and for running data as well Iike 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 SPCB/CPCB designs for which may be decided mutually.

9) 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 provisionhas to be made at each location.

10) 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 thesystems.

c) Software should be capable to operate remote stations configurations.

d) Control panel window should be available for controlling each analyzer.

e) Alarm window for valid alarms of all analyzers and sensors.

f) It should have transparent data – connection to each analyzer from remote.

g) System should be capable to remotely configure all stations through remote location using configuration file to maintain the uniformity. The configuration command from central or from regional location should be active.

11) Data Reports Generation

a) To prepare reports hourly, weekly, monthly, yearly in user defined interval and formats.

b) Mean, Median, Percentile, and Maximum, Standard deviation, Frequency analysis and Maximum Frequency analysis.

c) System should have predefined user selectable procedures through which reports of any specific station or multi stations reports upto four parameters can 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 reportingpossibilities with various available mathematical methods.

j) If required separate report generation procedures have to be developed for which firmwill be responsible for project duration.

C. 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 SPCB 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 (list attached).

D. Security

a. System should have the facility to have it Password protected or without password asdecided by SPCB at the time of implementation.
b. System software should be totally secured and any antivirus software required to run thesystem for the complete project duration has to be managed by the system provider.

E. 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. Since, system has to be placed in RTDAS.COM domain for which the web software developed along-with the database and web server software should be certified by CERT-IN empanelled vendors for vulnerability. The system provider is responsible for fulfilling all criteria required to place the system at said domain. The firm will be responsible for entire duration of the project for any vulnerability if noticed by above domain.

WORKSTATION COMPUTER FOR AQI

This has to be installed at CAAQM station for the preparation of AQI along with the station computer.

Specifications	
CPU	Intel® Core i7 4th generation or higher
Memory	8 GB DDR-III, 1600MHz, or better
Ethernet ports	Integrated intel ® Ethernet LAN 10/100/1000
PCI Slots	Two PCIex16 half height
Optical Drive	DVD R/W Internal
HDD's	3.5" 1TB, SATA drives
Power Supply	Standard suitable power supply
Keyboard	Optical Keyboard same as OEM
Mouse	Standard Optical Mouse same as OEM
I/O ports	4*USB 3.0
Monitor	17" Wide LCD TFT Color Monitor or better
Wireless adapter	USB Wireless adapter x 1 no.
OS support	Open source Ubuntu latest release
Warranty	Warranty is comprehensive on site including spares for 5 years
Type	Tower type Black in color preferably or as per the fitting in station rack

MANAGEABLE CISCO SWITCH (RACK MOUNTABLE)

Ethernet switch with LAN and WAN ports.

24 port managed fast/ gigabit Ethernet Cisco Switch with LAN and WAN ports of latest series for installation at respective SPCBs OR better

REMOTE MONITORING TOOL/SOFTWARE

Remote management software and its licenses for the entire project duration for station computer and central location at SPCB.

42 U INDUSTRIAL RACK

This is to be installed at Central Sever location (at respective SPCB's Head Office).

Specifications	**QTY / site**
19" Industrial Rack, 42U , Color Black Consisting of:-	**1**
Steel Enclosure, 9 Folded profile of dimensions 800 mm width * 1000 mm Depth * 42 U height, supporting 1000 Kgs load. Bottom cover with knock out holes for cable entry to be provided. Three pairs of horizontal support shall be fitted on both right and left sides.	1
Foldable Front & Rear Door to its half size while opening, shall be of 100% perforated. Provision for mounting fans on Rear door with concealed AC wiring.	2
Fan 230V, 90 CFM to be mounted on Rear Door.	4
AC Main Channel vertical two nos., 12x 5/15 Amps Sock RT-AQMP Make: Anchor with 32 Amps MCB make : Northwest or better	2

Horizontal Cable Manager	20
Vertical Cable Manager	10
Copper based Electrical Grounding / Earthing Strip. Provision for Fifteen (15) points.	1 Set
Each set of: a) Castor with Brake -- 2 Nos.	1 Set
b) Adjustable screw legs --4 Nos. OR	
c) Base frame1 No.	
Light provision activation in the rack up on opening of the front/rear door.	1
H/W Packet of 20 SRT-AQMP.	2

If anything else is required to setup the system, vendor need to have provision at the time of quoting.

RACK SERVER

This is to be installed at Central Sever location (at respective SPCB's Head Office) along with the 42U Industrial Rack.

Specifications	
CPU	Single CPU, Intel Xeon Quad Core E51620V3 3.50 GHz or higher, 10MB Cache per socket or higher. The Motherboard should support Dual Sockets.
Memory	32 (32 GB Support for each CPU) DDR-4, 1333/1600/1866/2133MHz, upgradable to 128 GB
Motherboard	Intel motherboard having compatibility to configuration desired
HDD	3*500GB SAS or better
Ethernet Port	2 *Dual port Gigabit NIC Cards with autosensing and on copper (total 4 ports). All four ports supporting iSCSI protocol to connect to iSCSI based SAN storage
PCI Slots	Provision for 2 *PCIexpress 2 * PCIe X2 or more slots to accommodate additional FC/Gigabit Cards Graphics Adaptors
Optical Drive	DVD R/W 16X Drive or better, External USB based
Form Factor	2U rack model with rail kit or better
Key Board	Standard Optical wireless Keyboard
Mouse	Standard Optical Wireless Mouse
I/O ports	2 *USB ports, front & 2USB port Back, 1 VGA Port, 1 external SAS, 1* Serial
Monitor	22" Wide LCD TFT Colour monitor
RAID Controller	RAID 5 minimum
Wireless adapter	USB Wireless adapter x 2 nos.
Antivirus Standard	Antivirus (McAfee / Norton / Trend Micro)
Redundant Power Supply & Fans	Redundant Power Supply 1+1, Redundant Fans
Warranty	Warranty is comprehensive 24x7 on site including spares for 5 years with 4 hours support

ACCESS POINT (AP)

This is required alongwith server at respective central station (SPCB).

Specification	
Features	1 Ethernet, 1 miniPCIe, USB, Additional memory, Gigabit, High power, Dual chain, Outdoor case

CPU	Atheros AR9342 600MHz network processor
Memory	64MB DDR onboard memory
Ethernet	One Gigabit port with Auto-MDI/X
Wireless	Built in 2GHz 802.11b/g/n, 2x RP-SMA connectors
Connector type	RP-SMA Female (outside thread)
Extras	Beeper, signal and status LEDs, SIM slot (requires 3g miniPCIe card), voltage and temperature sensors
Expansion	miniPCIe slot for 802.11 or 3G (using 3G disables the USB port), USB 2.0 port
Power options	PoE: 8-30V DC on Ether1 (Non 802.3af). Consumption: 14W at 24V
Dimensions	Not more than 400x150x100mm; Weight: 500g
OS	of respective OEMs
Kit includes	RB912 outdoor unit, PSU, PoE injector, mounting loop, DIN rail mount, mounting ring
Frequency Range	2400MHz-2500MHz

UTM (UNIFIED THREAT MANAGEMENT) DEVICE

This is required at respective SPCB Central station

Support and Warranty

Appliance should have EAL4+ Certification and ICSA certification for Firewall.

Appliance Throughput

- Firewall throughput of more than 5 Gbps.
- Minimum 1.2 Gbps of Antivirus Throughput
- Minimum 1 million Concurrent sessions
- Minimum 1 Gbps of IPS throughput
- Minimum 45,000 New Sessions/second
- Minimum 800 Mbps of IPsec VPN throughput
- Minimum of 1000 IPsec tunnel support and 50 SSL VPN user support.
- License for the same should be included in the BOM.
- 810/100/1000 interfaces supporting Hardware Bypass.

General Features

- Should be appliance based and rack mountable
- Identity based Firewall
- Intrusion Prevention System
- Gateway Anti-virus
- Gateway Anti-spam
- Web Content & Application Filtering
- Bandwidth Management
- Inbuilt-on Appliance Reporting

- Network: OSPF, Round Robin load balance, RIPv2, BGP, equal & unequal cost load balance, High Availability, QOS, etc. Round Robin Balance, Server Load Balancing.
- Support for user authentication over SMS.
- Country Based Blocking, FQDN support and should support MIX mode
- deployment
- 4 Eye Authentication feature for data integrity.

Gateway Antivirus, Anti-Spyware and Anti-Spam

- The proposed Integrated Anti-Virus/Ant-Spyware should have Web coast Checkmark Certification as part of a UTM. Virus, Worm, Trojan Detection and Removal, Automatic Virus signature database update, Real-Time blacklist, MIME header check, Redirect spam mails to dedicated email address, image-spam filter, Spam Notification, Zero hour Virus outbreak protection. Recurrent pattern Detection Technology for AS. Self Service Quarantine area.

Web and Application Filtering:

- The proposed Content Filtering should have at least one Certification as part of a UTM viz. Web coast Checkmark. URL, Keyword, File type block, Block Java applets, cookies, ActiveX, Block malware, phishing, pharming URL, block P2P application, anonymous proxies, Customized block on group basis. System should have Minimum of 70+ categories with more than 100 million URLS supported with more than 5000 application support.

Security Features

- Intrusion Prevention System (IPS): The proposed IPS should have Certification as part of a UTM viz. Web coast Checkmark. For different attacks like Mail Attack, FTP Attack, HTTP Attack, DNS Attack, ICPM Attack, TCP/IP Attack, DOS and DDOS Attack, TelNet Attack. Signatures: Default (more than 2000+), Custom , IPS Policies: Multiple, Custom, User-based policy creation, Automatic real-time updates from CR Protect networks, Protocol Anomaly Detection

VPN:

- IPsec, L2TP, PPTP and SSL as a part of Basic Appliance, VPN redundancy, Hub and Spoke support, 3DES, DES, AES, MD5,SHA1 Hash algorithms, IPsec NAT Transversal, VPNC Certified.

Load Balance:

- For Automated Failover/Failback, Multi-WAN failover, WRR based Load Balancing. High availability: Active-Active. QOS, OSPF, RIPv2, BGP, Policy routing based on Application and User support Round Robin Load Balancing.

Bandwidth Management:

- Application and user identity-based bandwidth management, Multi WAN bandwidth reporting, Guaranteed and Burstable bandwidth policy. Bandwidth for User, Group, Firewall Rule, URL and Applications.

Monitoring and Reporting System:

- Should include reports for Centralized management, Monitoring & Logging, Command line interface. Monitoring Gateways, Monitoring suspicious activity and alerts, Graphical real-time and historical monitoring, email notification of reports, viruses and attacks reports. IPS, Web filter, Antivirus, Anti-spam system reports. IP and User basis report, >40+ Compliance reports and >1000+ drilled down reports on the appliance with 250+ GB of storage.

License for UTM (Unified Threat Management)

- Three Years for Gate Way Antivirus, spyware, Anti-Spam, content and application filtering. IPS, reporting and support License period will be counted after activation

PRINTER SPECIFICATIONS

Three Years for Gate Way Antivirus, spyware, Anti-Spam, content and application filtering

- Print speed black: 25 ppm
- Resolution: 1200 x 1200 dpi
- Processor speed 750 MHz Print or better
- Paper handling input, standard 250-sheet input tray
- Duplex printing Automatic (standard)
- Media sizes supported A4 A5
- wireless connectivity and automatic two-sided printing
- automatically connect to wireless network,
- Easily print from virtually anywhere in the office with Ethernet and wireless connectivity
- Connect via USB, and access tools from PC to manage printer.
- 1,500-page toner cartridge or better

CONNECTIVITY FOR DATA TRANSFER

A) LEASED LINE CIRCUIT

1Mbps capacity leased line connectivity with 99% uptime service level agreement (SLA) to be provided by the firm at each station location. The leased line may be provided on copper or optical fiber or through RF depending upon the location.

B) BROADBAND

1Mbps capacity broadband connectivity from other than one already providing leased line connectivity shall be provided by the firm at each station.

C) GSM /Hotspot Connectivity

Internet connectivity will have to be provided by the firm for the entire project
duration at LED location either using GSM or Hotspot connectivity

F. DETAILS OF DESIRED DATA VALIDATION SYSTEM

Annexure-I

At least three tier request generation and requests acceptance procedure is 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 stations will have station computer installed with station data acquisition software and data transmission software.

The flow of data has to be from station 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 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 station 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 is rejected. If a 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.

G. 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	DGH Module	MeteoBus	VDO Navigation
NMEA183	BH/Timo 9600	Windobserver	

H. 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 validationprocedure in place?			
7.	Web software already developed ornot?			

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 orwithout password			
11.	Password providing facility availableat 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 empanelled 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 andexceedances 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 tobe 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 rosegenerating facility			
26.	Software has diurnal variationfacility			
27.	Software has mathematical tools			
28.	Software has 16 channels display aton page			
29.	Software has data communication error reports			

30.	System has error correctionprocedure			
31.	Software has parallel data display reports			
32.	Software has virtual channeldeployment capacity			
33.	Software has data encrypting procedures at stations or not? If yes then data can be retrieved fromstation or not?			
34.	Software compatible for ANDROID technology			
35.	System Provider will provide all Hardware required at station and Central			
36.	System Provider all necessary software required for data acquisition, display, Analysis, website uploading etc.			