DELHIPOLLUTIONCONTROLCOMMITTEE

5thFloor,ISBTBuilding,KashmereGate,NewDelhi-110006
Website: www.dpcc.delhigovt.nic.in

COMPETITIVEBIDDING(CB)

FOR

SUPPLY, INSTALLATION, COMMISSIONING AND 10 YEARS OPERATION & MAINTENANCE OF CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS (CAAQMS) FOR DELHI

DPCC

TenderDocumentNo.	**:**DPCC/Lab(A)/2025/T12
Issued on	**:**26/08/2025
ContactPerson	**:**Dr.NanditaMoitra(dpccairlab@gmail.com)

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Website: www.dpcc.delhigovt.nic.in

Tender Document No.:DPCC/Lab(A)/2025/T12 **Dated:** 26.08.2025

NOTICE INVITING TENDER (NIT)

1. Delhi Pollution Control Committee (DPCC) invites **open e-tenders for Supply, Installation, Commissioning with 10 years Operation and Maintenance of06 nos. Continuous Ambient Air Quality Monitoring Stations**. The Tender Document is available on Govt. of NCT ofDelhi e-procurement portal (govtprocurement.delhi.gov.in) and DPCC official website (dpcc.delhigovt.nic.in).
2. Details of the instrument required, specifications, eligibility and pre-qualifications to bid and instructions on how to bid and other details are available in the Tender Document which can be downloaded from Govt. of NCT ofDelhi e-procurement portal and DPCC official website.
3. Interested Bidders may download the Tender Documents and submit their Bid online on Govt. of NCT ofDelhi e-procurement portal (govtprocurement.delhi.gov.in)
4. Earnest Money Deposit **(EMD)** of **Rs. 50 lakhs (INR Fifty Lakh only)**, in the form of Bank Guarantee/DD/FDR in favour of "Delhi Pollution Control Committee" payable at New Delhi, must reach at the address given below on or before the last date of submission of bids. Bidders, however, have to attach scanned copies of EMD along with the Technical bid of theirtender.

Member Secretary,
Delhi Pollution Control Committee,
5th Floor, ISBT Building, Kashmere Gate, Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab(M. No. 9717593521)

CRITICAL DATE SHEET

Description	Date	Time
Date of Publishing	26/08/2025	10.00 AM
BidDocumentDownload/Start Date	26/08/2025	10.00 AM
Pre-BidQuerySubmission Date	01/09/2025	03.00 PM
Pre-BidMeetingDate	03/09/2025	12.00 PM
BidSubmissionStart Date	08/09/2025	03.00 PM
BidSubmissionEndDate	15/09/2025	03.00 PM
TechnicalBidOpening Date	15/09/2025	03.30 PM
FinancialBidOpeningDate	WillbeintimatedafterTechnical Evaluation	

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Member Secretary DPCC, Delhi

BIDDING DOCUMENT

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DPCC

DELHI POLLUTION CONTROL COMMITTEE

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

SECTION I

INSTRUCTIONS TO BIDDERS (ITB)

SECTION I

INSTRUCTIONS TO BIDDERS (ITB)

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1.0 DEFINITIONS

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

1.1 "The Project" or "The Works" mean Supply, Installation, Commissioning of equipment for Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and 10 years of Operations & Maintenance (O&M) of this CAAQMS at the pre-defined locations in Delhi.

1.2 "DPCC" means the Delhi Pollution Control Committee, having its office at 5th floor, ISBT Building, Kashmere Gate, Delhi-06 and shall include any person or persons authorized by the DPCC.

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

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

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

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

1.7 "The Authorized Representative" means the bidder who has enclosed the manufacturer's authorization as per the format "Form of Letter of Authorities" provided as Attachments2A and/or2C of Section III.

1.8 "The Contractor" means the Bidder, whose Bid for the Works has been accepted by the DPCC and includes his representatives, successors and authorized assignees.

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

1.10 "The Bidding Documents" mean all the documents in all Sections of this Documents and documents annexed thereto.

1.11 "The Contract" means the written agreement to be concluded between the DPCC 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 DPCC.

1.12 "The Equipment" means all kinds of materials, machinery, components, apparatus, articles and instruments for the Project to be provided by the Contractor to the DPCC under the Contract.

1.13 "The Specifications" means the specifications of the Works to be performed by the Contractor in conformity with those specified in the Technical Specifications i.e. Section VII of this document 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 DPCC through the Consultant in case prior to the Contract and agreed upon by both the DPCC and the Contractor after the Contract.

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

1.15 "The Sites" means CAAQMS at the defined locations in Delhi.

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

2.0 INTRODUCTION

2.1 DPCC intends to invite online bids through e-tender from eligible bidders for supply, installation and commissioning of equipment for Six (06)nos. Continuous Ambient Air Quality Monitoring Station (CAAQMS) with 10 years Operation & Maintenance (O&M) of these CAAQMS at specified locations.

2.2 Scope of Works

The description of Scope of Works (S/W) is set forth in Section-II of this document.

2.3 Size of Bid

The whole bid is for single composite package as detailed at Section II i.e. Scope of Works.

2.4 Eligible Source of Equipment and conformity to the bidding documents

2.4.1 All countries are the eligible source countries for goods and services to be supplied under this contract.

2.4.2 For the purpose of this clause "origin" means the place where the equipment or component parts thereof are grown, or produced. Equipment are 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.

2.4.3 The Bidder shall furnish the Certificate of Country of Origin (duly authenticated by competent authority of that country) of each Equipment (as per Attachment 3 to Section III) in these instructions, as the documentary evidence of the eligibility of the Equipment.

2.4.4 The origin of equipment may be distinct from the nationality of the bidders.

2.4.5 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. If mentioning the ones not available in India in that case extra instrument spare parts(imported) should be kept available with the O&M Contractor so that in case necessary, equipment spare parts may be replaced before the expiry of O&M period.

d) A clause-by-clause commentary of the DPCC's Technical Specifications demonstrating the equipment's substantial responsiveness of these specifications.

2.5 Qualifying Requirements of Bidders

This invitation for the Bid is open to any bidder who is a reputed manufacturer or authorized representative of the manufacturer, 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 bidder meets the following qualifying requirements:

2.5.1 The bidder should be a manufacturer or authorized dealer of items (i.e. Analyzers, Monitors, Calibrators and Sensors), who must have manufactured, supplied, tested and commissioned **minimum five (05) nos.** similar air monitoring stations with minimum five (subject to thecondition that all eightparameters should have beenincorporated in the eligibleprojects undertaken by Bidder)tendered parameters [NO-NO_2-NO_X, SO_2, NH_3, CO, Ozone, PM_{10}, $PM_{2.5}$, BTEX] either container-based or otherwise in **last seven (07) years** (reckoned as on date of techno-commercial bid opening) **with CPCB/State Pollution Control Board/ Semi-Govt. or any State or Central government organizations or Public Sector Undertakings (PSUs)** which should be in continuous operation as on date of techno-commercial bid opening. As evidence of being a manufacturer, bidder must enclose copy of manufacturer's license/manufacturer's brochure or catalogue for the aforesaid items i.e. Analyzers, Monitors, Calibrators and Sensors. As evidence of having manufactured, supplied and commissioned the stations, bidder must enclose copy of purchase orders / letters of award/agreement, clearly indicating the scope of work, which must include the supply and commissioning of ambient air monitoring stations either container based or otherwise.

2.5.2 For the item(s) not manufactured by the Bidder (i.e. Analyzers, Monitors, Calibrators and Sensors), the bidder should be authorized by the manufacturer(s) for these items as per the format "Form of letter of authorities" provided as Attachment 2C of Section III.

2.5.3 Bidder or their associate as O&M partner should have adequate financial capability to execute the contract. The bidder must have average annual turnover of minimum Rupees **12 Crore (INR Twelve Crores)** over **last three (03) years**. The annual turnover is to be supported by the annual report. Detail of annual turnover shall be furnished as per Attachment 6A Section III along with Audited Balance Sheets of last 03 years i.e. 2022-23, 2023-24, 2024-25.

2.5.4 (i) The bidder shall submit an Earnest Money Deposit **(EMD) of Rs. 50 Lakhs (Rupees Fifty Lakhs only)** in the form of Bank Guarantee/DD/FDR in favour of Delhi Pollution Control Committee, payable at Delhi. The EMD amount as specified above must accompany the tender. EMD is required to be submitted in original separately on or before the last date of submission of bid as per the NIT in DPCC. Scanned copy of EMD is required to be uploaded along with Technical Bid.

(ii) **EMD exemption shall be given to MSMEs as per applicable rules**provided they are registered for the said particularcategory/activity. If any MSME is not fulfilling the criteria as prescribed in the tender, their bid shall not be considered for evaluation. In case the Bidder falls in these categories, they should furnish certified copy of their registration with MSME clearly specifying the details of items for which they are registered. No relaxation shall be given to the Startups as the project under consideration relates to public safety and health.

(iii) The EMD shall be valid for a period of **45 days from** the date of opening of the bid.

2.5.5 Bids of bidders quoting **as authorized representative of a manufacturer** can also be considered, provided

(i) the manufacturer furnishes a legally enforceable authorization certificate in the prescribed form at Attachment-2Cof Section-III, assuming full guarantee and O&M obligations as per GCC and SCC, for the goods offered; and

(ii) the bidder, as authorized representative, supplied, tested, and commissioned **minimum 05 nos.** of similarair monitoring stations, either container-based or otherwisewith CPCB/ State Pollution Control Board/ Semi-Govt. or any State or Central government organizations or Public Sector Undertakings (PSUs)in any one year of the last seven (07) years which should be in **continuous operation during lastseven (07) years** ason date of techno-commercial bid opening.

2.5.6 The bidder should furnish the information on all past supplies and satisfactory performance for both 2.5.1 and 2.5.5 (ii) above, in "Performance Statement" as per Attachment No. 6B&6C respectively of Section III. Further, the bidder shall furnish documentary evidencesfrom minimum 2 nos. different clients (**CPCB/State Pollution Control Board/Semi-Govt. or any State or Central government organizations or Public Sector Undertakings (PSUs)**) in favour of bidder in support of continuous operation of minimum **Five (05) nos.** similar air monitoring stations.

2.5.7 The bidder or their associates with an O&M partner in India, (any authorized agency in India) should have well trained O&M personnel. The details of minimum manpower required are as given in table below. Bidder should enclose the curriculum vitae of following persons with required experience:

S. No.	Responsibility	No. of Persons	Minimum Qualifications	Experience
1	Project Manager	1	Graduate Engg./ M.Sc.	05 years
2	Technician	3	Diploma in Electronics / C&I / Electrical	03 years
3	Data Analyst	1	Science Graduate with IT background or IT Engg./MCA or statistics graduate	02 years

The bidder shall furnish the above details in the format as per Attachment 7 of Section III.

2.5.8 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 Attachments6D and 15 of Section III. The **bidder** should have successfully completed **at least two (02) years CMC / O&M** for a minimum **of five (05) nos. CAAQMS**in any CPCB/State Pollution Control

Board/Semi-Govt. or any State or Central government organizations or Public Sector Undertakings (PSUs)**during the last seven (07) years**.

2.5.9 Notwithstanding anything stated above, the owner reserves the right to assess the bidder's capability and capacity to perform the contract, should the circumstances warrant such assessment in the overall interest of the owner.

2.5.10 The successful bidder must have office in DELHI-NCR with all set up and required stock of essential consumables and spares parts so that uninterrupted operation and services are ensured. Thebidder shall furnish an undertaking (which will be an integral part of the contract) in Stamp Paper of Rs. 10/- or higher regarding the establishment of office-cum-service-center within DELHI-NCR preferably in Delhi. The bidder or OEM should be directly operational with office set up in India for a minimum of last two (02) years from the date of NIT.

2.5.11 The bidder must provide, from the manufacturer, an undertaking for supply of spares and consumables for 10 years ofOperation & Maintenance (O&M) through this contract. The details are to be furnished as per Attachment 2B of Section III.

2.5.12 The bidder shall have ISO 9001:2015 Certification valid as on last date of submission of bid.

2.5.13 **Blacklisting criteria:** The bidder should not have been debarred by any Government (State / Central) / Semi Government / Corporation / PSU/tendering department in India in **last three (03) years** for unsatisfactory past performance, corrupt, fraudulent or any other unethical business practices as specified in Rule 151 of GFR, as on date of NIT.Such abandonment or punishment will be considered as disqualification towards eligibility, A declaration in the form of affidavit has to be furnished by prospective bidders along with bid submission.

3.0 BIDDING DOCUMENTS

3.1 Issue of Documents

A complete set of Bidding Documents may be downloaded by any interested Bidder from Government of NCT of Delhi e-procurement portal (govtprocurement.delhi.gov.in) and DPCC website.

3.2 Check of the Bidding Documents

Upon downloading of the Bidding Documents, the Bidder shall check the number of pages and drawings and notify the consultant of any missing or duplicate pages and drawings or of any figures or words, which may be indistinct or ambiguous. No claim will be admitted as a result of the Bidder's failure to comply with the foregoing. The address (same as Pre-Bid Conference address) for the contact is specified in Sub-clause 3.5(i) of this ITB.

3.3 Contents of the Bidding Documents

(i) The Biding Documents include:

Section I	INSTRUCTIONS TO BIDDERS
Section II	SCOPE OF WORK
Section III	FORM OF TECHNO-COMMERCIAL BID

Section IV	FORM OF FINANCIAL BID
Section V	GENERAL CONDITIONS OF CONTRACT (GCC)
Section VI	SPECIAL CONDITIONS OF CONTRACT (SCC)
Section VII	TECHNICAL SPECIFICATIONS
Section VIII	CHECKLISTS

(ii) Bidders must acquaint themselves with all the Bidding Documents embodied in all the sections of this document. 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.
DPCC shall reserve the right and privilege to settle the affairs in case any doubt may occur concerning the Bidding Documents.

3.4 Clarification of Bidding Documents

(i) Pre-Bid Conference

The Bidder or his authorized representative is invited to attend the pre-bid conference to be held at the **office of In-charge Air Lab, DPCC, 5th Floor, ISBT Building, Kashmere Gate Delhi-06**, on the date & time mentioned in the IFB for CAAQMS Package.

a) Thepurpose of the conference will be to clarify any issues regarding the Bidding Document.
b) The bidder is required to submit questions **in writing or by email (dpccairlab@gmail.com)** to reach not later than two days prior to the pre-bid conference. Record notes of conference including the text of the questions raised and responses given will be transmitted without delay to prospective bidders. Any modification of the Bidding Document which may become necessary as a result of the pre-bid conference shall be made by the DPCC exclusively through an addendum to the bidding documents after getting the approval of Competent Authority in DPCC.
c) Non-attendance of the pre-bid conference will not be a cause for disqualification of a bidder.
d) The bidder is not expected to raise any additional query after pre-bid conference and DPCC is not obliged to reply any such queries.

3.5 Amendment of Bidding Documents

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

(2) All prospective Bidders who have down loaded the Bidding Documents will be notified about the amendment through e-procurement portal and same shall be binding on them.

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

4.0 PREPARATION OF BID

4.1 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 DPCC shall be written in English. Failure to comply with this may disqualify a bid.

4.2 One Bid per Bidder

Each Bidder shall submit one Bid only. A Bidder who submits or participates in more than one Bid in a particular package will be disqualified.

4.3 Local Representation

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

1) ThepreciserelationshipbetweentheBidderandhisIndianAgent.
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.

b) Agent's commission, if any, (to be included in the Bid Price) shall be indicated separately but as a part of Bid Price and the same will be payable only in Indian Rupees. Indian agent's commission will not be subject to any escalation whatsoever and will be payable at the time of final payment after successful commissioning & training.

c) The bidder/Contractor shall not pay Indian Agent's Commission, unless declared in the bid.

4.4 Bid Security / Earnest Money

(1) Pursuant to Clause 5.1 in this instruction, the Bidder shall furnish, as part of its Bid, his Bid Security in the amount as mentioned in the IFB in the form of Banker's cheque or Bank Guarantee in favour of DPCC, payable at New Delhi.

(2) The Bid security shall be **valid for Forty-five (45) days** beyond the final bid validity period. 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 in the form of Bank Guarantee shall be submitted from a Bank listed in Attachment 12 of Section-III.

(4) Any Bid without Bid Security will be rejected by the DPCC 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 ITB and furnish Performance Security in accordance with Clause 14 in this ITB;
d. If the Bidder / his representative commits any fraud while competing for this contract.
e. In case the Bidder/Contractor is disqualified from the bidding process in terms of Section 3 and 4 of Integrity Pact.

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

4.5 Validity of Bid

The bid shall remain valid and binding on the Bidder for **one hundred eighty (180) days** from the final time and date for submission of the Bid. Bid validity for a shorter period shall be rejected by the DPCC as non-responsive.

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

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

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

4.6 Modification and Withdrawal of bid

a) The Bidder may modify or withdraw its Bid after the Bid's submission; provided that written notice of the modification or withdrawal is received by the DPCC **prior to the deadline prescribed for submission of Bids**.

b) The bidder's modification or withdrawal notice shall be prepared, sealed, marked, dispatched and uploaded in accordance with the provisions of clause 5 & 6 (ITB) for Techno-commercial and financial bid respectively, with the outer and inner envelope additionally marked "MODIFICATION" or "WITHDRAWAL", as appropriate. A withdrawal notice may also be sent by e-mail but must be followed by a signed confirmation copy.

c) No Bid shall be allowed to be modified subsequent to the deadline for submission of Bids.

d) No bid shall be allowed to be withdrawn in the interval between the deadline for submission of Bids and the expiration of the period of bid validity specified in the clause 4.5 above. Withdrawal during this period may result in the forfeiture of the bid security pursuant to clause 4.4 (5) (a).

4.7 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 it may lead to forfeiture of Bid Security.

The DPCC 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 DPCC's action.

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

4.8 Contacting the DPCC

Except for responses to request for clarification of the Bid by the DPCC, the Bidder shall not contact the DPCC 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 DPCC 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.

5.0 PREPARATION OF TECHNO-COMMERCIAL BID

Single stage two envelope bidding procedure shall be followed for the subject Package as under:

Envelope-I	**:**	**Techno-commercial Bid**
Envelope-II	**:**	**Financial Bid**

The techno-commercial bid to be submitted by the bidder through e-procurement Portal of Delhi Govt (govtprocurement.delhi.gov.in).

5.1 Qualification Documents (To be uploaded at tender website)

1) Attachments in support of meeting qualifying requirements as per Clause No. 2.5 for the quoted packages (Attachments 6A, 6B, 6C, 6D, 8 of Section-III)
2) Copy of certificate of local branch, sales, residential and representative office(s) of the Bidder in India as per certificate for pursuant to Attachment 1 of Section-III.
3) Certificate of letter of authority from manufacturers for all the Equipment (Attachment 2A, 2C of Section III).
4) Certificate from manufacturer stating the country of origin of each Equipment duly authenticated by competent authority of that country (Attachment 3 of Section III).
5) Certificate of carrying out O&M by O&M Partner (Attachment 15 of Section III).
6) List of Equipment offered (Attachment 5 of Section III).
7) List of Manufacturers of the equipment offered (Attachment 6 of Section III).
8) Pre-requisite for installation of equipment offered (Attachment 9 of Section III).
9) All other necessary documents as per Clause No.2.5
10) Checklist-1 & 2 of Section-VIII of this document to be submitted along with mandatory mention of the page no. at each rowfor PDFsattached by the bidder.

5.2 Techno-Commercial bid including technical Specifications and Catalogues (To be uploaded at tender website)

1) No Deviation Certificate (Attachment 10 of Technical Bid, Section III)

2) Technical Data sheets of the Equipment in the package (Section-VIII i.e. Checklist-2) offered in accordance with Section VII:

   a) The Bidder shall **clearly indicate contents and quantities of standard accessories** for the proposed Equipment in the blanks.
   b) The Bidder shall understand that decision of the DPCC will be binding in regards of anything not specifically mentioned in the technical specification.
   c) The Bidder shall **offer only one manufacturer, one brand, one model**.
   d) The Bidder shall submit complete set of original catalogues and/or photographs and/or pamphlets illustrating principal feature.

6.0 PREPARATION OF FINANCIAL BID

The Price Bid is to be submitted online through e-tendering mode only in main screen of Bid invitation and shall compromise of following components:

Item Data

The bidder shall fill up online in “Basic Price Conditions” field, the price data, against items mentioned in the item data in main screen of bid invitation. The other price conditions if provided in items may also be filled up at bidder’s option. The total bid price can be viewed through output preview tab.

(a) Attribute in General Data

The attributes, if mentioned in general data, requiring any confirmation/information are to be ticked/filled up suitably.

(b) Conditions in General Data

The option to give discount (on the prices filled up in item data) in "Header Discount" field provided in conditions tab in general data shall **not** be allowed to bidder.

(c) Documents to be uploaded in main screen of Bid Invitation

The bid form (Price Bid) as per Section-IV, duly completed together with the following attachments and price schedules shall be uploaded through e-procurement portal.

Note: Bidders may note that Bid Form (Price Bid) together with its attachment and price schedule should not be uploaded.

6.1 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.

6.2 Bid Form

The Bid Price to be quoted by the Bidder shall be prepared according to the Attachment 1 "Bid Form" in Section IV without any alteration or change.
The Bid Price shall be quoted for performing the Contract strictly in accordance with the Technical Specifications.

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

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

6.3 Summary of Bid Price

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

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

(i) For the Goods Supplied from Foreign Origin
(ii) For the Goods Supplied from India
(iii) Price of other incidental cost such as Indian Agent's Commission, if any. The Bidder shall specify the same.
(iv) Cost of O&M of CAAQMS for Ten (10) years including insurance.
(v) Training
The Bidder shall quote the price for the training as indicated in clause 10 of S/W. Cost of Travel, Boarding & Lodging and local transport cost of participants shall be borne by the bidder.

Note:

(1) **Quoted Price of O&M of a CAAQMS for each year** should be at least 12% of the cost of supply & installation of the CAAQMS. In case the bidder quotes O&M cost lower than 12% of the supply & installation Price, the Owner will reduce the supply & installation cost suitably, so as to make the O&M cost as 12% of the supply & installation cost, keeping the total quoted cost as unchanged.

(2) All the local taxes & duties as applicable in the State of India i.e. Custom Duty, Excise duty, GST, Entry Tax, etc. which will be payable on the Equipment if the Contract is awarded shall be paid as actual by the bidder (Refer clause 33.0 of GCC).

(3) Service tax as applicable shall be payable on the Service portion of the O&M Cost only (excluding supply of spares for Maintenance & Overhauling).

6.4 Bid Price Breakup

The Bidder shall prepare and submit the Bid Price Breakdown (CIF Price or Ex-works price as applicable) for each item of the quoted package(s) in accordance with Attachment 3 in Section IV.

The Bidder shall prepare and submit break-up of Operation & Maintenance (O&M) of CAAQMS as per Attachment 3A in Section-IV.

6.5 Currencies of Bid

The unit rates and the prices shall be quoted by the bidder separately in any one of the International Trading Currencies for the equipment, which the bidder proposes to supply.

7.0 COMPLETION AND SUBMISSION OF BID

7.1 Completion of Bids

The Bid including all attached documents shall be digitally certified using class III digital signature by a duly authorized representative of the bidder to bind him to the contract. The **authorization** shall be indicated by written power of attorney as per ITB clause 5 and shall be **submitted in physical form** prior to date & time of bid submission.

Bidders should note **that no zip file is to be uploaded online**. Further file related to particular Attachment/Schedule including their Annexure/Appendices, if any, shall be given name of that Attachment/Schedule only.

7.1.1 **Techno-Commercial Bid**

Techno-commercial bid **should not contain any price content entry. In case, the Techno-commercial bid is found to contain any price content, such bid shall be liable for rejection.**

7.1.2 **Financial Bid**

While filling up the rates/amounts, the Bidder shall ensure that there is no discrepancy in the unit rates/amounts. In case of such a discrepancy, the rate/amount mentioned in Schedule of Quantities shall be taken as final and binding. Discrepancies and adjustment of errors shall be corrected in line with ITB Sub-Clause 11.2.

7.2 Submission of Bids

Bid shall be submitted through online (e-tender) mode.

(a) Techno-Commercial Bid

Bidder will attach the completed Technical Bid Form and Schedules along with all annexure as per Section-III and Checklist-1&2 (Section-VIII). Bidders to ensure that **all uploaded documents must be digitally certified**. Bidders to further ensure that documents uploaded are being downloaded properly. DPCC shall not be responsible for corrupted files, if any.**All the document sets uploaded should have a table of contents with corresponding page numbers at the first page of the document set**.

(b) Price Bid

The bid form (Price Bid) as per Section-IV, duly completed together with the attachments and price schedules (Section-IV) shall be uploaded.

(c) The following **documents to be submitted in physical form** (as brought out at ITB Clause 5.1) shall **be sealed and marked in** the **following manner**:

(i) The bid security in original, furnished in accordance with ITB Clause 4.4, shall be sealed in a separate envelope, duly marking the envelope as "ATTACHMENT-1, BID SECURITY".

The Bids once opened shall not be returned to the Bidders regardless of the result of the Bid. This will apply to both the Techno-commercial and financial bids in case a bidder is not qualified at the stage of Techno-commercial evaluation.

8.0 OPENING AND EVALUATION OF TECHNO-COMMERCIAL BID

8.1 Opening of Technical Bid

Only the Technical Bid will be opened at the place specified in Sub-Clause 7.2 here above. Bidders or their representatives may attend the opening if required.

8.2 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 DPCC processing of Bids or award decisions may result in the rejection of the Bidder's Bid. The request for clarification and response shall be in writing, but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the

correction of arithmetic errors discovered by the DPCC in the evaluation of the bids in accordance with the clause 11.2 of these instructions.

8.3 Clarification of Techno-commercial Bids

To assist the Techno-commercial examination and evaluation of bids, DPCC may, at its discretion ask the bidder for a clarification of its Techno-commercial bid. All responses to request for clarification shall be in writing, and no change in the price bid shall be sought, offered or permitted.

8.4 Preliminary Examination

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

Prior to detailed evaluation of Techno-commercial bids, pursuant to clause 8.5, the DPCC will determine the substantial responsiveness of each Bid to the Bidding Documents including acceptable quality of goods offered pursuant to clause 2.4 & 2.5. A substantially responsive Bid is one, which conforms to all terms and conditions of the Bidding Documents without material deviations, objections, conditionality or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; (ii) that limits in any substantial way, inconsistent with bidding documents, the Owner's right or the successful Bidder's obligations under the Contract; or (iii) whose rectification would unfairly affect the competitive position of other Bidders who are presenting substantially responsive bids.

No deviation, whatsoever, is permitted to the provisions of Bidding Documents. A bid with deviation to any of the provisions of Bidding Documents will be liable to be rejected.

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

8.5 Evaluation of Techno-commercial Bid

(1) The DPCC 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 DPCC to any part of the Techno-commercial Bids, the Bidders will be requested to clarify the same in writing.

8.6 Evaluation Criteria of Techno-commercial Bid

The Bidder who fulfil 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 shortlisted Bidders only.

9.0 NOTIFICATION OF SUCCESSFUL TECHNO-COMMERCIAL BID

After completing the techno-commercial evaluation of the Techno-commercial Bid first, the DPCC will notify through e-Procurement portal of Delhi Govt. the pre-qualified and techno-commercially responsive Bidders, of the date and time for the opening of the Financial Bid.

10.0 OPENING OF FINANCIAL BID

The Bidders to whom the opening date and time for the Financial Bid shall be notified by the DPCC through e-procurement portal of Delhi Govt.

11.0 EXAMINATION OF FINANCIAL BID

11.1 After opening of the Financial Bid, the Expert Committee in DPCC 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 DPCC 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.

The Financial Bid which is incomplete or conditional will be rejected.

11.2 During examination of Financial Bid, any **arithmetical errors** shall be corrected as follows:

a) If there is any discrepancy between words and figures, the amount in words will prevail.
b) 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.
c) The amount stated in the Form of Bid shall be adjusted by the DPCC 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 4.4 (5).

12.0 EXAMINATION OF FINANCIAL BID

12.1 Evaluation Procedure

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

12.2 The purchaser's evaluation of a bid will take into account following factors:

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

1) The CIF port of entry price of the equipment to be offered from abroad including price of consumables & spare parts.
2) The ex-factory / ex-warehouse / off-the shelf price of the equipment to be offered from within India (such price include all costs as well as duties and taxes paid or payable on components and raw material incorporated or to be incorporated in the equipment).
3) Local costs i.e.
   a. Cost of port handling and custom clearance,
   b. Transportation cost from Port of de-embarkment to Sites,
   c. Insurance from Port of de-embarkment up to handing over and
   d. Installation and commissioning charges at site.
4) Other incidental costs, if any (such as Indian agent's commission)

II. Cost of Training

III. O&M cost (including insurance) for ten years as Net Present value discounted @10% per annum

IV. Quoted price of O&M of a CAAQMS for each year should be at least 12% of price of supply & installation of the CAAQMS. In case the bidder quotes O&M price lower than 12% of the supply & installation cost:

a. Total quoted supply & installation price shall be reduced and O&M price shall be increased by the same amount, so as to make the O&M price as 12% of the supply & installation price, KEEPING THE TOTAL QUOTED PRICE AS UNCHANGED.

b. In such case, break-up price of various components of the Supply & Installation price shall be reduced on pro-rata basis.

Note: Taxes and duties shall not be considered for the purpose of evaluation.

12.3 The DPCC will evaluate and compare Bid for complete package.

12.4 The rate of exchange for evaluation

To facilitate evaluation and comparison, the Owner will convert all Tender prices to Indian Rupees at the BC selling exchange rate as determined by the State Bank of India, **on the date of opening of Techno-commercial Bids**.

12.5 Clarification on Financial Bid

For the purpose of examination, evaluation and comparison of the Financial Bid, the DPCC may 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.

12.6 Withdrawal for deviations

Bidders may note that all deviations / variations and additional conditions etc. found in the bid, 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, the bid shall be rejected and the bid security of the bidder may be forfeited.

12.7 Illustrative Method of Evaluation:

(a) Quoted Price of Supply (QP) which includes:

i. The CIF port of entry price of the equipment to be offered from abroad including price of consumable & spare parts.
ii. The ex-factory / ex-warehouse / off-the-shelf price of the equipment to be offered from within India (such price include all costs as well as duties and taxes paid or payable on components and raw material incorporated or to be incorporated in the equipment).
iii. Local cost i.e.
    a. Cost of port handling and custom clearance,
    b. Transportation cost from Port of de-embarkment to Sites,
    c. Insurance from Port of de-embankment up to handing over and
    d. Installation and commissioning charges at site.
iv. Other incidental costs, if any (such as Indian agent's commission).
v. Cost of Training

(b) Net Present Value (NPV) of O&M Cost

Year No.	Quoted Price (QP) of O&M	Present Value	NPV of O&M Cost (N)
1st	O_1	$PV_1 = O_1$	$N = (PV_1 + PV_2 + PV_3 + PV_4 + PV_5 + PV_6 + PV_7 + PV_8 + PV_9\ PV_{10})$
2nd	O_2	$PV_2 = O_2/1.1$	
3rd	O_3	$PV_3 = O_3/(1.1)^2$	
4th	O_4	$PV_4 = O_4/(1.1)^3$	
5th	O_5	$PV_5 = O_5/(1.1)^4$	
6th	O_6	$PV_6 = O_6/(1.1)^5$	
7th	O_7	$PV_7 = O_7/(1.1)^6$	
8th	O_8	$PV_8 = O_8/(1.1)^7$	
9th	O_9	$PV_9 = O_9/(1.1)^8$	
10th	O_{10}	$PV_{10} = O_{10}/(1.1)^9$	

(c) Final Evaluated Bid Price = QP + N

13.0 AWARD OF CONTRACT (NOA)

13.1 Award of Contract to Successful Bidder

The DPCC 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 DPCC, to be qualified technically, financially and otherwise in respect of such other capabilities, as the DPCC may deem necessary and appropriate to satisfactory performance of the Contract.
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 DPCC reserves the right to reject any bid or bids received at its discretion without assigning any reason whatsoever.
4. The successful bidder including MSME exempted if unable to comply with the LOA's conditions, shall be liable to be blacklisted.

13.2 Notification of Award

Prior to the expiration of the Bid Validity pursuant to sub-clause 4.5 in this Instructions, DPCC will notify the successful Bidder in writing by registered letter or by email to confirm that its Bid has been accepted.

The Notification of Award (NOA) will constitute the formation of the Contract.

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

13.3 Signing of Contract

The successful bidder has to submit its acceptance; details required for opening of LC along with Bank Guarantee within thirty days from date of issue of NOA. In case of delay in submission of record, delivery period will be counted from date of issue of order and LD clause will be applicable.

The Contract shall take the form of General and Special Condition attached at 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 2 of Section VI) for distribution to the parties concerned in addition to soft copies.

14.0 PERFORMANCE SECURITY

Within thirty (30) days of notification of award from the DPCC, the successful Bidder shall furnish the Performance Security in the form of bank guarantee issued by a Scheduled bank (enclosed list atAttachment-13 of Section-III) having license to do business in India in accordance with Attachments 1A & 1B (Section VI) i.e. "Performance Security Form" provided in Special Conditions of Contract (SCC) for amount as follows:

(i) **10%** of the value of contract for supply part valid till 90 days after successful Installation and Commissioning of all 06 Stations.
(ii) **10%** of the value of contract for O&M services valid up to 90 days beyond O&M period of 10 years.
(iii) **CPG for supply part shall be released after submission of CPG for O&M services**.

The Performance Bank Guarantee shall be in the name of Delhi Pollution Control Committee (DPCC), Delhi.

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.

15.0 RESPONSIBILITY FOR INFORMATION SUPPLIED

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

SECTION II

SCOPE OF WORK (S/W)

SECTION II

SCOPE OF WORK

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SCOPE OF WORK (S/W)

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 CAAQMS Equipment at the defined locations
2. Operation and Maintenance (O&M) of the CAAQMS for a period of 10 years from the date of commissioning
3. Daily reporting of data pertaining to Ambient Air Quality to DPCC/CPCB. DPCC would make payment for CAAQMS as per schedule of requirement for Supply, Installation and Commissioning of the system. DPCC would procure all the CAAQMS equipment on its name. DPCC 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 DPCC / CPCB. The price for the data supply would include the Operation and Maintenance, including incidental charges, electricity, manpower, security, etc.

DPCC would provide land for installation of CAAQMS free of cost, in the identified location to the Successful Bidder. Along with the land, DPCC would provide letter/ documents for telephone and electricity connections at the proposed location. 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.

The Day light & Night visible, live data display system is to be supplied, installed and maintained initially for ten years. The Day light & Night visible, live data display system will be installed one at each CAAQMS and one centralized data display system for display of online data of all CAAQMS installed or to be installed in Delhi by DPCC (if required for other Bidders). The successful bidder shall also arrange telephone and electricity connections at the identified location and all the documents required for the connection shall be provided by the Committee. 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 installation requirement for Display System is to be arranged by the successful bidder and cost for same should be included in bid price.

(b) SCHEDULE OF REQUIREMENTS

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

S. No.	Brief Description	Qty. in nos.
1	Continuous Automatic Air Quality Monitoring Analyzers for CO, SO_2, NO-NO_2-NO_X+NH_3, O_3, and $PM_{2.5}$ and PM_{10} Monitors	1 unit each
2	BTEX Analyzer	1 Unit
3	Multi-calibration systems for gaseous monitors comprising of gassupply / generation and automated calibration	1 Unit

S. No.	Brief Description	Qty. in nos.
4	Meteorological Instrumentation comprising Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mountedon telescoping crank-up Meteorological Mast	1 Set
5	Computer system consisting of one PC along with Laser Printer and DAS at the monitoring station and one PC along with Laser Printer at central office with all necessary IT peripherals and software for data acquisition / Data display Board / transfer andsystem integration, telephone, Modem	1 Lot
6	Modem	2 Units
7	Recommended spares and supplies	1 Lot
8	Data Display System	1 Unit
9	Housing/Container for Continuous Automatic Monitoring Stations with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line fittings, Tools (electrical and mechanical), and Recommended spares.	1 Unit
10	UPS, 10 kVA (1hr. full load back-up)	1 Unit
11	UPS, 5 kVA (2hrs. full load back-up)	1 Unit
12	Split Air Conditioners (2 Ton capacity)	2 Units
13	Split Air Conditioners (1 Ton capacity)	1 Unit
14	RCC foundation, pillars misc. works including civil & electrical	1 Lot
15	Security Cabin	1 Lot

2.0 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 DPCC officials station-wise.

B) Operation & Maintenance (O&M) of Air Monitoring Stations for a period of ten (10) years from the date of commissioning of the station.

C) Data & Report of data pertaining to CAAQMS to DPCC/CPCB.

D) On line transfer of data to DPCC & CPCB.Development of API as and when required for online transfer/integration of data to/with governmental bodies.

Other services involved with performance of the Works are specified in Bid documents.

3.0 MINIMUM TECHNICAL SPECIFICATIONS

The minimum technical specification requirements for the CAAQMS to be installed are given in SECTION– VII (Technical Specifications) of bid document. 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 SECTION– VII (Technical Specifications) of bid documents are descriptive and SelectionCommittee can consider technical proposals having similar specifications. If required during O&M Period, there should be a provision to add any new analyzers/monitor to the setup.

4.0 DESIRED OUTPUT FOR CAAQMS EQUIPMENT

The desired output requirements from the CAAQMS equipment to be installed are given in Attachment 2 to 6 of Scope of Work (S/W) of this bid document.

5.0 DATA MANAGEMENT AND QUALITY CHECKS

A. 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 analysers 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 (SOP) for** the air quality monitoring stations to the Buyer **at the time of bid submission**. This Standard Operating Procedure shall be approved by the DPCC 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

Data obtained from these calibration checks and copies of associated Quality Assurance and calibration documentation, shall be submitted to the Committee 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 DPCC once per year, Successful Bidder shall agree to submit to an audit of calibrations, conducted, using pre-approved US EPA methodologies, by a third party. Third party audit will be arranged by the Owner (DPCC) or by the agency decided by them, at their cost and bidder shall provide all necessary facilities to carryout required audit. The results of these audits shall be made immediately available to both the Seller and Buyer.

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

B. GENERAL GUIDELINES

Working Hours:
The site for CAAQMS operation should be manned by the employees of the Successful Bidder for 24 hours a day. In addition, the Successful Bidder would arrange for a security of the site and equipment through appointment for security agency (providing at least one security guard) 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 with a copy to DPCC of an appropriate amount.

Station platform, pillars Electricity & telephone / modem arrangement:
The successful bidder shall construct station 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 concerned DPCC.

6.0 LOCATION

The location of the Air Monitoring Stations in Delhi shall be intimated in Notification of Award (NOA). The tentative locations are as below:

S. No.	Name	District	State	Latitude	Longitude
1	IGNOU	South	Delhi	28.493716	77.201206
2	JNU	South	Delhi	28.540722	77.168545
3	DOS/ISRO/Earth Station	New Delhi	Delhi	28.608719	77.180484
4	Commonwealth Sports Complex	Central	Delhi	28.615828	77.271993
5	Delhi Cantt.	New Delhi	Delhi	28.59417	77.1251
6	Netaji Subhash University of Technology (West Campus)	South West	Delhi	28.594005	76.909423

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 equipment shall be made by the Bidder including power supply and telephone / mobile/ internet connection, however all the required document shall be arranged by the DPCC.

9.0 INSPECTION AND TEST

9.1 Unpacking Inspection

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

9.2 Performance Test

The Contractor shall carry out the performance test for all the Equipment supplied under the scope of work of this document.
In case the Equipment for performance test requires the supplemental and/ or supporting Equipment, the Contractor shall carry out the performance test including such Equipment.

10.0 PROVISION OF TRAINING

The supplier shall provide the training to the two (02) DPCC officials for each station for minimum two (02) weeks after the performance test and commissioning. Training should include but not limit to the following:

1) Inspection of the Equipment.
2) Precautions in use of the Equipment.
3) Basic measurement principle.
4) Principles of operation of the Equipment.
5) Start-up and shutdown procedure.
6) Operation of the Equipment.
7) Calibration method.
8) QA/QC.
9) Data Validation including calibration
10) Data Management and software application.
11) Safety precautions.
12) Basic maintenance procedure.
13) "Dos" and "Don'ts" in operation of the Equipment.
14) Handling of hazardous chemicals and gas.
15) Others, which are deemed to be necessary by the Supplier.

In case the Equipment for training requires the 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 DPCC during installation of the Equipment.

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

Contents of training manual and/or CD for the Equipment are as follows:

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

11.0 OPERATION AND MAINTENANCE (O&M) of AIR MONITORING STATIONS

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

a) Operation and Maintenance (O&M) of all the commissioned equipment 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 Air Monitoring Station (including all equipment) for O&M after execution of Indemnity Bond as per format placed at Attachment-11 of Section III of bid document.

c) The Contractor shall provide to the owner a monthly summary of all operation and maintenance activities performed by the contractor during each month.

d) Operation and Maintenance Obligations:
In implementing its obligations to operate and maintain the facility under this Contract, the Contractor shall:

i) Undertake comprehensive maintenance including i.e. schedule and breakdown maintenance & repair at site and keep Committee 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 OEM for any assistance for whichequipment is required to be sent to the works. Contractor shall arrange substitute equipment to keep CAAQM station operational.

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

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

v) It is the duty of the Contractor to secure the movable, immovable and other properties of the Owner at the Air Monitoring Station. The Contractor shall indemnify the loss caused to the Owner on account of any damage, loss or theft caused to the property of the Owner.

vi) 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.

vii) 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.

viii) The Contractor shall source all the spares required for maintenance & repairs of the installed equipment from OEM only.

e) The Operator shall **not**:

i) Make any modifications as to the 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 Air Monitoring Stations. All such material supplied and other items shall be the property of the Contractor. However, all the spares shall be sourced from OEMs only.

g) The Contractor shall review all applicable Laws and initiate and maintain such prosecution, procedures and operating plans relating to operation of the 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 provide data for ambient air to DPCC on daily basis in the suggested format. The daily, monthly and yearly Reporting Formats are attached in bid documents.

i) The CAAQMS has to be in operation for a minimum of 90% of the days in a year, 24 hours a day, 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 suggested output formats given in the bid document.

i) Establish and maintain a daily and monthly and yearly reporting system to provide storage and ready retrieval of operation and maintenance data including such information necessary to verify calculations. The monthly reporting shall contain variances from targets.
ii) Provide access to the owner to the Air Monitoring Stations and its data at all reasonable times and as and when required.
iii) Provide the operational data required to all competent authorities including, Government of India or concerned State Governments.
iv) Display of data on webpage of DPCC and CPCB along with Air Quality Index (AQI) as per protocol devised by CPCB shall be provided by bidder. Vendor shall ensure all parameters related to health of instruments and diagnostics as well as site parameters are to be transmitted and made available for evaluation, perusal, analysis and validation of data on DPCC and CPCB servers.
v) Protocol dated 30.04.2015 for data transmission for CAAQM stations as provided by CPCB shall be followed.

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

l) The contractor shall ensure periodic re-calibration of all the equipment as per manufacturer's instructions and maintain "Protocol for Manual Calibration" as per Attachment 2 Section II.

11.2 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 Service Tax, etc., imposed upon Owner by the Applicable Law.
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 electricity & telephone connection at the site. However, monthly charges for both electricity and phone bill shall be borne by the Contractor.
e) The **valid data capture rate (DCR) should be minimum 90%.** The full payment shall only be made if validated data is 90% and all the calibration protocol maintenance scheduled and spare parts/consumable replacement document are maintained and verified by the owner/ DPCC. The contractor has to maintain records/Receipts/bills paid available as and when required.

11.3 Handing Over of Station:

On expiry/closure/termination of the Contract Agreement, stations shall be handed over to Committee in working condition to the satisfaction of Committee. 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.

11.4 Relocation of Station:

During contract period, if DPCC intends to shift CAAQM station from one location of the city to another location, due to some reason – functional or otherwise, Bidder shall shift the CAAQMstation for which cost of shifting including dismantling, loading & transportation, reinstallation at new location and construction of foundation will be paid by the DPCC at a mutual agreed cost.

11.5 Penalties

i) During O&M period, in case of any Analyses/system failure, penalty will be charged by DPCC @ 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).
ii) For a failure of Data display on Board/panel, a penalty will be charged by DPCC @ 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).
iii) Failure due to power outage and other Force Majeure conditions shall not be considered for levy of penalty.

iv) 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 analyzer/system has to be replaced.

v) 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 DPCC shall have the right to terminate the O&M contract.

12.0 SCHEDULE

12.1 Contractor shall complete all activities covered in the scope of work up to installation & commissioning of Air Monitoring Stations **within 45 days** from date of notification of award.

12.2 The Contractor shall carry out Operation & Maintenance (O&M) of Air Monitoring Stations for a period of ten (10) years from the date of commissioning of the station.

12.3 The operation and maintenance contract shall be executed by the Member Secretary of Delhi Pollution Control Committee having jurisdiction of the area under his control. The term and condition shall be governed as per the tender document. The Member Secretary of DPCC or any person authorized by him shall be the ultimate consignee.

ATTACHMENT - 1

EQUIPMENT LIST

S. No.	Brief Description	Qty. in nos.
1	Continuous Automatic Air Quality Monitoring Analyzers for CO, SO_2, NO-NO_2-NO_X+NH_3, O_3, and $PM_{2.5}$ and PM_{10} Monitors	1 unit each
2	BTEX Analyzer	1 Unit
3	Multi-calibration systems for gaseous monitors comprising of gas supply / generation and automated calibration	1 Unit
4	Meteorological Instrumentation comprising Wind Direction, Wind Speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted on telescoping crank-up Meteorological Mast	1 Set
5	Computer system consisting of one PC along with Laser Printer and DAS at the monitoring station and one PC along with Laser Printer at central office with all necessary IT peripherals and software for data acquisition / Data display Board / transfer and system integration, telephone, Modem	1 Lot
6	Modem	2 Units
7	Recommended spares and supplies	1 Lot
8	Data Display System	1 Unit
9	Housing/Container for Continuous Automatic Monitoring Stations with Sampling line, Internal fitting, Instruments racks, Electrical and Gas line fittings, Tools (electrical and mechanical), and Recommended spares.	1 Unit
10	UPS, 10 kVA (1hr. full load back-up)	1 Unit
11	UPS, 5 kVA (2hrs. full load back-up)	1 Unit
12	Split Air Conditioners (2 Ton capacity)	2 Units
13	Split Air Conditioners (1 Ton capacity)	1 Unit
14	RCC foundation, pillars misc. works including civil & electrical	1 Lot
15	Security Cabin	1 Lot

ATTACHMENT - 2

STATION PROTOCOL FOR MANUAL CALIBRATION CAAQM STATION UNDER O&M CONTRACT

NAME OF CAAQM STATION: **DATE:**

S. No.	Parameter	Status	Zero Value		Zero Offset		Span Calibration			K Factor (Span)		Remarks
			Pre	Post	Pre	Post	Span Source	Pre	Post	Pre	Post	
1	**CO** Analyzer											
2	**SO_2** Analyzer											
3	**NO_X** Analyzer											
	NO											
	NO_2											
	NO_X											
	NH_3											
4	**O_3** Analyzer											
5	**BTEX** 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**											
9	**UPS / ACs / Others**											
10	**Data Display Board**											

S. No.	Parameter	Status	Zero Value		Zero Offset		Span Calibration			K Factor (Span)		Remarks
			Pre	Post	Pre	Post	Span Source	Pre	Post	Pre	Post	
11	**Maintenance Details/ Requirement**											
	1.											
	2.											
	3.											
12	**Specific Observation(s)**											

ATTACHMENT - 3

DAILY REPORTING FORMAT FOR METEOROLOGICAL PARAMETERS

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

Location: **Date:**

Hrs.	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 METEOROLOGICAL PARAMETERS

(To be submitted monthly next day ending month)

Location: **Date:**

DATE	WIND SPEED	WIND DIRECTION	HUMIDITY	TEMPERATURE	SOLAR RADIATION	RAINFALL	REMARKS
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							

ATTACHMENT - 5

DAILY REPORTING FORMAT FOR MAIN POLLUTANTS

(To be submitted daily at 06:00 morning for previous day ending at 06:00 next morning)

Daily Report Station Name: _____ Month: _____
Report No.: _____ Date: _____
Monitoring Location: _____
Data Interval: 1 Hr. Average Monitoring
Conducted By: _____

Hrs.	NO	NO_2	NO_X	NH_3	SO_2	CO	O_3	$PM_{2.5}$	PM_{10}	Benzene	Toluene	E-Ben	MP-Xylene	O-Xylene
	µg/m³	µg/m³	ppb	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
06-07 Hr.														
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.														
16-17 Hr.														
17-18 Hr.														
18-19 Hr.														
19-20 Hr.														
20-21 Hr.														
21-22 Hr.														
22-23 Hr.														
23-00 Hr.														
00-01 Hr.														
01-02 Hr.														
02-03 Hr.														
03-04 Hr.														
04-05 Hr.														
05-06 Hr.														
MINIMUM														
MAXIMUM														
AVERAGE														
Data Captured														
Note:														

ATTACHMENT - 6

MONTHLY REPORTING FORMAT FOR MAIN POLLUTANTS (MEAN CONCENTRATION)

Year: …….

Monitoring Location: ……

Months	NO	NO_2	NO_X	NH_3	SO_2	CO	O_3	$PM_{2.5}$	PM_{10}	Benzene	Toluene	E-Ben	MP-Xylene	O-Xylene
	µg/m^3	µg/m^3	ppb	µg/m^3	µg/m^3	mg/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
January														
February														
March														
April														
May														
June														
July														
August														
September														
October														
November														
December														
MINIMUM														
MAXIMUM														
AVERAGE														

ATTACHMENT - 7

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…….		Rs.
Bill raised for spares and consumables Invoice No……. Date…….		Rs.
Total Amount		Rs.
Name of the Station:	**STATION I (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%**
Base Amount per Quarter (as per NOA) **(A)**		
Proportionate Amount based on Valid Data Captured Rate **(B)** Formula: see at Footnote*		
Applicable Deduction as per penalty provision for continuous non-functioning **(C)**		
Any Other Deduction, specify with justification **(D)**		
Applicable Taxes & Duties **(E)** - Service Tax - Education Cess - Secondary & Higher Education Cess - CST		
Net Amount Payable (F) **[F = B-(C+D)+E]**		
Total O&M cost Payable (Station-wise)		
Total Amount Payable (‘) for O&M cost for City for quarter no. 1/2/3/4 of year……		

* Percentage quarterly data captured rate/ 90% x A

SECTION III

FORM OF TECHNO-COMMERICAL BID

SECTION III

FORM OF TECHNO-COMMERCIAL BID

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ATTACHMENT - 1

<Letterhead of the Bidder>

CERTIFICATE OF O&M PARTNER OF THE BIDDER IN INDIA

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Subject :**Details of O&M Partner of the Bidder 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 wuth OEM (Name of the manufacturer) :
7. Total Manpower :
8. Total No. of trained Service Engineer :
9. Present No. of offices in India (Name the locations & address) :
10. Total Turnover in last 3 years :
11. Major current jobs in Hand :
12. Experience in O&M contract :

S. 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 – 2A

<Letterhead of the O&M Associate>

FORM OF LETTER OF AUTHORITY BY O&M ASSOCIATE

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Name of O&M Associate

Subject :**Letter of Authority from O&M Associate**

Dear Sirs,

We, <O&M Associate>, a company duly organized and existing under the law of <Country Name> with its principal office of business at<Address> hereby authorize <Name of Bidder>, a company duly organized and existing under the laws of <Country Name> with its principal office of business at <Address> and are manufacturers of at least 06 nos. of Ambient Analyzers as listed in the Scope of Work, to be our true and lawful attorney in fact to do the following sets and deeds:

To present and bind us in O&M of complete Continuous Ambient Air Quality Monitoring Stations (CAAQMS) for DPCC in the state of Delhi, India.

We, as a O&M Associate 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 agree that we shall carry out the O&M of the06 nos. CAAQMS's at Delhi in accordance with the terms and conditions of the contract with <Name of Bidder> and the DPCC. We further agree to furnish additional Bank Guarantee for 10% of Contract Value in addition to the CPG to the Delhi Pollution Control Committee.

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

IN WITNESS WHEREOF, we have hereto signed this document on ……..2025.
ACCEPTED ON ……..2025.

NAME OF BIDDER	NAME OF ISSUING O&M ASSOCIATE
_____	_____
(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 –2B

<Letterhead of the Manufacturer Associate>

FORM OF LETTER OF AUTHORITY BY MANUFACTURER AS ASSOCIATE

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Name of Manufacturer

Subject :**Letter of Authority from Manufacturer as Associate**

Dear Sirs,

We, <Name of Manufacturer>, a company duly organized and existing under the law of <Country Name> with its principal office of business at<Address> hereby authorize <Name of Bidder>, a company duly organized and existing under the laws of <Country Name> with its principal office of business at <Address> and are in the business of Supply and O&M of Continuous Ambient Air Quality Monitoring Stations (CAAQMS), to be our true and lawful attorney in fact to do the following sets and deeds:

To present and bind us in Supply of complete Continuous Ambient Air Quality Monitoring Stations (CAAQMS) for DPCC in the state of Delhi, India, regarding the supply and installation of the following equipment proposed in the bid which we manufacture or produce.

S. 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 agree that we shall manufacture, deliver and install the equipment in accordance with the terms and conditions of the contract with <Name of Bidder> and the DPCC. We further agree to furnish additional Bank Guarantee for 10% of Contract Value in addition to the CPG to the Delhi Pollution Control Committee.

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

IN WITNESS WHEREOF, we have hereto signed this document on ……..2025.
ACCEPTED ON ……..2025.

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 –2C

<Letterhead of the Manufacturer>

FORM OF LETTER OF AUTHORITY BY MANUFACTURER

(For Equipment NOT manufactured by Bidder and/or his Associate)

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Name of Manufacturer

Subject :**Letter of Authority from Manufacturer**

Dear Sirs,

We, <Name of Manufacturer>, a company duly organized and existing under the law of <Country Name> with its principal office of business at <Address> hereby authorize <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 Supply& Installation of completeContinuous Ambient Air Quality Monitoring Stations (CAAQMS) for DPCC in the state of Delhi, India, regarding the supply and installation of the following equipment proposed in the bid which we manufacture or produce.

S. 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 agree that we shall manufacture, deliver and install the equipment in accordance with the terms and conditions of the contract with <Name of Bidder> and the DPCC.

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

IN WITNESS WHEREOF, we have hereto signed this document on ……..2025.
ACCEPTED ON ……..2025.

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)

Note: Separate authorization for each equipment as listed in Attachment-1 (i.e. List of Equipment) to Scope of Work (i.e. Section-II) and not manufactured by bidder himself or his associate shall be furnished.

ATTACHMENT – 3

<Letterhead of the Manufacturer>

FORM OF CERTIFICATE OF COUNTRY OF ORIGIN

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

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 DPCC in the State of Delhi, India, is to be manufactured in the country mentioned below:

S. No.	Name of Equipment	Country of Origin

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 agree that we shall manufacture, deliver and install the equipment in accordance with the terms and conditions of the contract with <Name of Bidder> and the DPCC.

Signature :
Name of Person :
Title :

Name of Manufacturer :
Office Seal of Manufacturer :
Legal Address of Manufacturer :

ATTACHMENT – 4

<Letterhead of the Manufacturer>

FORM OF CERTIFICATE OF SUPPLY OF SPARES AND CONSUMABLES BY MANUFACTURER

(To be furnished by manufacturers of all Equipment)

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Name of Manufacturer

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

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

It is hereby guaranteed that we shall maintain stocks of consumables and spare parts for the following equipment for a period of Ten (10) years after the commissioning of the equipment in India.

S. No.	Name of Equipment	Name of Manufacturer

Signature :
Name of Person :
Title :

Name of Manufacturer :
Office Seal of Manufacturer :
Legal Address of Manufacturer :

ATTACHMENT – 5

<Letterhead of the Bidder>

FORM OF EQUIPMENT LIST

S. No.	Name of Equipment	Proposed Model	Name of Manufacturer	Quantity	Country of Origin	Technical Catalogue Attached (Yes/No)

ATTACHMENT – 6

<Letterhead of the Bidder>

FORM OF MANUFACTURERS LIST

(Imported and Indigenous items)

S. No.	Name of Equipment	Name of Manufacturer	Address, Telephone, Fax Nos. and Email ID

ATTACHMENT – 6A

<Letterhead of the Bidder>

PROFORMA FOR FINANCIAL CAPABILITY OF BIDDER

Tender ID No……
Date of Opening…… Time of Opening…….
Name of the Bidder……..

Year	Currency	Turnover
2021-2022 Financial Year		
2022-2023 Financial Year		
2023-2024 Financial Year		

Note:The Annual Turnover amount is to be supported by Annual Report.

Signature of the Authorized Representative :
Name of Person :
Position :

ATTACHMENT – 6B

PROFORMA FOR PERFORMANCE STATEMENT FOR MANUFACTURER

(for a period of last seven (07) years)

Tender ID No…… Name of Equipment…….

Date of Opening…… Time of Opening……..

Name of the Manufacturer…….

Order Placed by (full address of the Purchaser)	**Order No. & Date**	**Description of ordered equipment** (Model No.)	**Quantity Supplied**	**Value of Order**	**Date of Commissioning and handing over**	**Has the equipment been in continuous operation ?** (Attach certificates from the purchaser/consignee for each equipment)
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Note: Bidder to furnish above detail for each equipment of the quoted package on separate sheet.

Signature of the Authorized Representative :

Name of Person :

Position :

ATTACHMENT – 6C

PROFORMA FOR PERFORMANCE STATEMENT FOR BIDDER AS AUTHORIZED REPRESENTATIVE OF THE MANUFACTURER

Tender ID No…… Name of Equipment…….
Date of Opening…… Time of Opening……..
Name of the Manufacturer…….

Order Placed by (full address of the Purchaser)	**Order No. & Date**	**Description of ordered equipment** (Model No.)	**Quantity Supplied**	**Value of Order**	**Date of Commissioning and handing over**	**Has the equipment been in continuous operation ?** (Attach certificates from the purchaser/consignee for each equipment)
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Note: Bidder to furnish above detail for each equipment of the quoted package on separate sheet.

Signature of the Authorized Representative :
Name of Person :
Position :

ATTACHMENT – 6D

PROFORMA FOR PERFORMANCE STATEMENT FOR BIDDER AS O&M OPERATOR OF THE CAAQMS

(for a period of last seven (07) years)

Tender ID No…… Name of Equipment…….
Date of Opening…… Time of Opening……..
Name of the Manufacturer…….

Order Placed by (full address of the Purchaser)	**Order No. & Date**	**Description of ordered equipment** (Model No.)	**Quantity Supplied**	**Value of Order**	**Date of Commissioning and handing over**	**Has the equipment been in continuous operation ?** (Attach certificates from the purchaser/consignee for each equipment)
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Note: Bidder to furnish above detail for each equipment of the quoted package on separate sheet.

Signature of the Authorized Representative :
Name of Person :
Position :

ATTACHMENT – 7

<Letterhead of the O&M Partner>

CAPABILITY & EXPERIENCE OF BIDDER / O&M ASSOCIATE FOR O&M OF CAAQMS

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

S. No.	**Name** of the O&M personnel proposed to be deployed	**Educational Qualification**	**Experience in no. of years** in **carrying out O&M of CAAQMS**	Detail Curriculum Vitae (CV) attached **(YES/NO)**

Note: Detail CV to be attached along with this attachment.

ATTACHMENT – 8

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,

Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Dear Sirs,

In accordance with Invitation for Bids under your <Bid Document No>, having its Registered/Head Office at <Address of Bidder> (here-in-after called the 'Bidder') wish to participate in the said bid for <Name of Contract Package>.

As an irrevocable bank guarantee against Bid Security for an amount of ……(*)…… valid for ……days from the ……(**)…… required to be submitted by the Bidder as a condition precedent for participation in the said bid which amount is liable to be forfeited on the happening of any contingencies mentioned in the Bidding Documents.

We, The<Name & address of the Bank>, having our Head Office at ……(#)…… guarantee and undertake to pay immediately on demand by <Name of the Employer> the amount of ……(*)…… without any reservation, protest, demand and recourse. Any such demand made by the 'Employer' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder.

This Guarantee shall be irrevocable and shall remain valid up to ……(@)…… If any further extension of this guarantee is required, the same shall be extended to such required period (not exceeding one year) on receiving instructions from M/s <Contractor's Name> on whose behalf this guarantee is issued.

In witness where of the Bank, through its authorized officer, has set its hand and stamp on this……..day of ……2025 at……..

WITNESS:

……	……
(Signature)	(Signature)
……	……
(Name)	(Name)
……	……
(Official Address)	(Designation with Bank Stamp)

Attorney as per Power of Attorney No. …….

Date…….

Note:

1. (*) The amount shall be as specified in the Bid Data Sheets
   (**) This shall be the date of opening of Bid.
   (#) Complete mailing address of the Head Office of the Bank to be given.
   (@) This date shall be **forty-five (45) days after** the last date for which the bidis valid.

2. The Stamp Paper of appropriate value shall be purchased in the name of guarantee issuing Bank.

ATTACHMENT – 9

<Letterhead of the Bidder>

PRE-REQUISITES FOR INSTALLATION OF EQUIPMENT

Dear Sir,

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

Package No. / S. No.	Name of the Equipment	Installation & Commissioning pre-requisites*

*Requirement of power supply (kW / kVA etc.), power backup, air conditioning, hooding, space, furniture, gas supply, etc. to be mentioned by the bidder.

Signature of the Authorized Representative :
Name of Person :
Position :

Note:Continuation sheets, of size and format, may be used as per Bidder's requirement and shall be annexed to this schedule.

ATTACHMENT – 10

<Letterhead of the Bidder>

SUPPLY, INSTALLATION & COMMISSIONING ALONG WITH OPERATION & MAINTENANCE OF CAAQMS FOR DPCC

(No Deviation Certificate)

Bidder's Name & Address

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Dear Sir,

Subject: No Deviation Certificate

With reference to the <Tender ID No.> for <Tender Name>We declare that we have taken no deviations, variation from the Scope of Supply & Services as outlined in your Technical Specifications for the subject package. The entire work shall be performed as per your specifications and documents. Further, we may agree the conditions, if any found elsewhere in the offer, save that pertaining to any rebates/discount offered, shall not be given effect to.

We confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred tender document and related documents. We hereby confirm our unqualified acceptance to all terms &conditions, unqualified compliance to technical specification, integrity pact.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null &void.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Date: (Signature)

Place: (Printed Name)

(Designation)

(Common Seal)

ATTACHMENT – 11

INDEMNITY BOND FOR HANDING OVER OF CONTINUOUS AMBIENT AIR QUALITY MONITORING STATION INCLUDING ALL EQUIPMENT TO THE O&M CONTRACTOR

This Indemnity Bond is made this ……. Day of 2025 ……by …….., a Company registered under the Companies Act, 1956 / Partnership firm / Proprietary concern having its registered office at …….. (hereinafter called as "Contractor" or "obligator" which expression shall include its successors and permitted assigns) in favour of Delhi Pollution Control Committee, with office at 5th floor, ISBT Kashmere Gate Building, Delhi-110006, India, which term shall include permitted assigns and successors (hereinafter called "DPCC" which expression shall include its successors and assigns).

Whereas DPCC has awarded to the Contractor, a contract for O&M of the 06 nos. Continuous Ambient Air Quality Monitoring Stations (CAAQMS) located at Delhi, vide its Letter of Intent / Letter of Award (LoA) / Contract No. ……..dated……(hereinafter called the "Contract"), in the terms of which Contractor shall be responsible for the Equipment to be handed over to it by DPCC for the purpose of the Contract (hereinafter called the "Equipment").

Now, therefore this Indemnity Bond witnessed as follows:

1. That in consideration of various Equipment as mentioned in the Contract, valued at Rs…… (Indian 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 DPCC indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment 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 Equipment at Continuous Ambient Air Monitoring Stations (CAAQMS) belonging to DPCC against all risks whatsoever till the Equipment are duly used in accordance with all terms of the Contract. The Contractor undertakes to keep DPCC harmless against any loss or damage that may be caused to the Equipment.
3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/ execution of the Contract strictly in accordance with its terms and conditions and no part of the Equipment 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 DPCC is and shall remain the exclusive Owner of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The Equipment shall at all times be open to inspection and checking by Project-in-Charge DPCC shall always be free at all time to take possession of the Equipment in whatever form the Equipment may be. If in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any act of omission or commission on the part of the Contractor; he finds itself and undertakes to comply with the direction or demand of DPCC to return the Equipment 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 DPCC 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 DPCC 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 DPCC, then the above bond shall be void, but otherwise, it shall remain in full force and virtue.

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

SCHEDULE NO.1

Particulars of the Equipment handed over	Quantity	Value of the Equipment	Signature of Attorney in token of receipt

For and on behalf of M/s……

Name
Signature
Designation
(of Authorised Representative)
(Common Seal)
(in case of Company)

Witness I

1. Signature
2. Name
3. Address

Witness II

1. Signature
2. Name
3. Address

Note:

*Indemnity Bonds are to be executed by the authorised persons and **(i)** in case of contracting Company under common seal of the Company or **(ii)** having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, **(iii)** In case, (ii) the original Power of Attorney it is specifically for our contract or a Photostat copy of the Power of Attorney if it is a General Power of Attorney and such documents should be attached to Indemnity Bond.

ATTACHMENT – 12

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

SCHEDULED COMMERCIAL BANKS

PUBLIC SECTOR BANKS	
1	State Bank of India
2	Bank of Baroda (Including Vijaya Bank and Dena Bank)
3	Bank of India
4	Bank of Maharashtra
5	Canara Bank (Including Syndicate Bank)
6	Central Bank of India
7	Indian Bank (Including Allahabad Bank)
8	Indian Overseas Bank
9	Punjab National Bank (including Oriental Bank of Commerce and United Bank of India)
10	Punjab & Sind Bank
11	Union Bank of India (including Andhra Bank and Corporation Bank)
12	UCO Bank

PRIVATE BANKS	
1	Axis Bank Ltd.
2	Catholic Syrian Bank Ltd.
3	City Union Bank Ltd.
4	Development Credit Bank Ltd.
5	Dhanlaxmi Bank Ltd.
6	Federal Bank Ltd.
7	HDFC Bank Ltd.
8	ICICI Bank Ltd.
9	IndusInd Bank Ltd.
10	Jammu & Kashmir Bank Ltd.
11	Karnataka Bank Ltd.
12	Karur Vysya Bank Ltd.
13	Kotak Mahindra Bank Ltd.
14	Lakshmi Vilas Bank Ltd.
15	Nainital Bank Ltd.
16	Ratnakar Bank Ltd.
17	South Indian Bank Ltd.
18	Tamilnad Mercantile Bank Ltd.
19	Yes Bank Ltd.
20	Bandhan Bank
21	IDFC Bank Ltd.
22	IDBI Bank Ltd.

FOREIGN BANKS			
1	The Royal Bank of Scotland N.V	23	Mizuho Corporate Bank Ltd.
2	Abu Dhabi Commercial Bank Ltd.	24	Oman International Bank
3	Antwerp Diamond Bank N.V	25	Societe Generale
4	Arab Bangladesh Bank Ltd.(AB Bank)	26	Sonali Bank
5	Bank International Indonesia	27	Standard Chartered Bank
6	Bank of America	28	State Bank of Mauritius
7	Bank of Bahrain & Kuwait B.S.C	29	JSC - VTB Bank
8	Bank of Ceylon	30	UBS AG
9	Bank of Nova Scotia	31	American Express Banking Corporation
10	Bank of Tokyo - Mitsubishi Ltd.	32	First Rand Bank Ltd.
11	Barclays Bank	33	Commonwealth Bank of Australia
12	BNP Paribas	34	United Overseas Bank Ltd.
13	China Trust Bank	35	Credit Suisse A.G
14	Shinhan Bank	36	Sberbank
15	Citibank N.A	37	Australia and New Zealand Banking Group Ltd.
16	Credit Agricole Corporate and Investment Bank	38	Rabobank International
17	Deutsche Bank	39	National Australia Bank
18	DBS Bank Ltd.	40	Woori Bank
19	Hongkong and Shanghai Banking Corpn. Ltd.	41	Industrial & Commercial Bank of China
20	J.P. Morgan Chase Bank N.A	42	Sumitomo Mitsui Banking Corporation
21	Krung Thai Bank	43	Westpac Banking Corporation
22	Mashreqbank	44	Doha Bank

ATTACHMENT – 13

LIST OF BANKS ACCEPTABLE FOR SUBMISSION OF BANK GUARANTEE FOR ADVANCE PAYMENTS, PERFORMANCE SECURITIES AND SECURITIES FOR DEED OF JOINT UNDERTAKING (IF APPLICABLE)

SCHEDULED COMMERCIAL BANKS

PUBLIC SECTOR BANKS	
1	State Bank of India
2	Bank of Baroda (Including Vijaya Bank and Dena Bank)
3	Bank of India
4	Bank of Maharashtra
5	Canara Bank (Including Syndicate Bank)
6	Central Bank of India
7	Indian Bank (Including Allahabad Bank)
8	Indian Overseas Bank
9	Punjab National Bank (including Oriental Bank of Commerce and United Bank of India)
10	Punjab & Sind Bank
11	Union Bank of India (including Andhra Bank and Corporation Bank)
12	UCO Bank

PRIVATE BANKS	
1	Axis Bank Ltd.
2	Catholic Syrian Bank Ltd.
3	City Union Bank Ltd.
4	Development Credit Bank Ltd.
5	Dhanlaxmi Bank Ltd.
6	Federal Bank Ltd.
7	HDFC Bank Ltd.
8	ICICI Bank Ltd.
9	IndusInd Bank Ltd.
10	Jammu & Kashmir Bank Ltd.
11	Karnataka Bank Ltd.
12	Karur Vysya Bank Ltd.
13	Kotak Mahindra Bank Ltd.
14	Lakshmi Vilas Bank Ltd.
15	Nainital Bank Ltd.
16	Ratnakar Bank Ltd.
17	South Indian Bank Ltd.
18	Tamilnad Mercantile Bank Ltd.
19	Yes Bank Ltd.
20	Bandhan Bank
21	IDFC Bank Ltd.
22	IDBI Bank Ltd.

FOREIGN BANKS			
1	The Royal Bank of Scotland N.V	23	Mizuho Corporate Bank Ltd.
2	Abu Dhabi Commercial Bank Ltd.	24	Oman International Bank
3	Antwerp Diamond Bank N.V	25	Societe Generale
4	Arab Bangladesh Bank Ltd.(AB Bank)	26	Sonali Bank
5	Bank International Indonesia	27	Standard Chartered Bank
6	Bank of America	28	State Bank of Mauritius
7	Bank of Bahrain & Kuwait B.S.C	29	JSC - VTB Bank
8	Bank of Ceylon	30	UBS AG
9	Bank of Nova Scotia	31	American Express Banking Corporation
10	Bank of Tokyo - Mitsubishi Ltd.	32	First Rand Bank Ltd.
11	Barclays Bank	33	Commonwealth Bank of Australia
12	BNP Paribas	34	United Overseas Bank Ltd.
13	China Trust Bank	35	Credit Suisse A.G
14	Shinhan Bank	36	Sberbank
15	Citibank N.A	37	Australia and New Zealand Banking Group Ltd.
16	Credit Agricole Corporate and Investment Bank	38	Rabobank International
17	Deutsche Bank	39	National Australia Bank
18	DBS Bank Ltd.	40	Woori Bank
19	Hongkong and Shanghai Banking Corpn. Ltd.	41	Industrial & Commercial Bank of China
20	J.P. Morgan Chase Bank N.A	42	Sumitomo Mitsui Banking Corporation
21	Krung Thai Bank	43	Westpac Banking Corporation
22	Mashreqbank	44	Doha Bank

ATTACHMENT – 14

PRE-CONTRACT INTEGRITY PACT

General

This Pre-Bid Contract Agreement (hereinafter called the Integrity Pact) is made on ……. day of the month of ……..2025, between Delhi Pollution Control Committee, acting through Member Secretary, DPCC, (hereinafter called the "BUYER", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s…… represented by Shri……, Chief Executive Officer (hereinafter called the "BIDDER / SELLER" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of he 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 relevant law in the matter and the BUYER work under the aegis of Environment & Forests performing its functions as per the provisions of Water Act 1974, Air Act 1981, and EPA Act 1986.

NOW, THEREOF,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealing prior to, during and subsequent to the currency of the contract to be 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 impact of 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 hereby agree o enter into this Integrity Pact and agree as follows:

1. **Commitments of the BUYER**
   - 1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
   - 1.2 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.

1.3 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 the contract would not be stalled.

3. Previous Transgression

3.1 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.

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

4. Sanctions for Violations

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

(i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER (s) would continue.

(ii) (The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. 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) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) 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.

4.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

4.3 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.

5. Fall Clause

5.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India, State Pollution Control Boards 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.

6. Independent Monitors

6.1 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).

6.2 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.

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

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

6.5 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.

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

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

6.8 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.

7. Facilitation of Investigation

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

8. Law and Place of Jurisdiction

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

9. 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.

10. Validity

10.1 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.

10.2 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.

11. The parties hereby sign the Integrity Pact at ……. on ……..

BUYER	BIDDER
Member Secretary	<Name>
Delhi Pollution Control Committee	Chief Executive Officer

	<Company Name>
Witness 1	**Witness 2**
<Signature>	<Signature>
<Name>	<Name>

ATTACHMENT – 15

<Letterhead of the O&M Partner>

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

Date:

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Subject :**Certificate of carrying out O&M of CAAQMS' 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 & Maintenance (O&M) of the 06 nos. CAAQMS installed and commissioned by <Name of the main bidder> for a minimum of 10 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 :
Office Seal of O&M Partner :
Legal Address of O&M Partner in India :

Counter-signed by main bidder
Name of Person :
Position :
Name of the Bidder :
Office Seal of Bidder :
Legal Address of Bidder :

SECTION IV

FORM OF FINANCIAL BID

SECTION IV

FORM OF FINANCIAL BID

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ATTACHMENT - 1

<Letterhead of the Bidder>

BID FORM

Date : ……..
Grant No. : ……..
Bid No. : ……..

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Gentlemen:

1. Having examined the Bidding documents for procurement, installation & commissioning and Operation & Maintenance (O&M) of CAAQMSs' at six (06) nos. locations in Delhi (hereinafter 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 documents for the sum of International Trading Currency……(in words……..) for the equipment including all other charges as mentioned in the document, supplied from Foreign origin and Indian Rupees…… (in words……..) for the incidental costs incurred in India (if any) as may be ascertained in accordance with the Summary of Bid Price and Bid Price Breakup attached herewith and made part of this bid.
2. We undertake, if our Bid is accepted, to complete and deliver the whole of the Works comprised in the Contract within the time specified in the contract, subject to the said conditions.
3. If our Bid is accepted, we will obtain the guarantee of a bank in a sum as mentioned at Clause No. 14 of ITB (Section-I) for the due performance of the Contract, in the form prescribed by the DPCC.
4. We agree to abide by this Bid for a period of **One hundred eighty (180) days** from the final date of the submission of Bid fixed in sub-clause 4.5 of the Instruction of Bidders, and shall remain binding 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, and that you will not defray any expense incurred by us in bidding.

Date this……..day of …….2025

Signature……..in the capacity of…….

Duly authorized to sign Bid for and on behalf of……. (IN BLOCK CAPITAL)

Address :
Facsimile No. :

Telephone No. :
Email ID :

WITNESS
Signature :
Name :
Address :
Occupation :

ATTACHMENT - 2

<Letterhead of the Bidder>

SUMMARY OF BID PRICE

DESCRIPTION	Value per CAAQMS	Value for 06 nos. CAAQMS
I. SUPPLY OF THE EQUIPMENT		
1) For goods supplied from abroad (In Bid-Currency) a) FOB price for package b) Freight for complete package c) Insurance up to port of de-embankment		
CIF Price at port of de-embankment (Bid Currency) **(1a + 1b + 1c)**		
2) Local Costs for goods supplied from abroad a) Port handling and clearance charges b) Transportation cost from port of de-embankment to Sites c) Insurance covering all risks from port of de-embankment up to handing over d) Installation and Commissioning		
Sub-Total **(2a + 2b + 2c +2d)**		
3) For the Goods Supplied from India a) The price of the Equipment quoted ex-works, ex-factory, ex-warehouse, or off-the-shelf including all custom duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of the Equipment quoted ex-works or ex-factory b) Price for handling and inland transportation, insurance up to handing over the equipment at Site and other local costs up to delivery of the Equipment to each Site. c) Installation and Commissioning d) Price of other incidental cost, if any. Then the Bidder shall specify the same.		
Sub-Total **(3a + 3b + 3c + 3d)**		
4) **Other incidental costs, if any** (such as Indian agents Commission) **in INR**		
TOTAL FOR SUPPLY (1 + 2 + 3 + 4)		
II. Total O&M Cost for ten years as indicated in Attachment-3A		
III. COST OF TRAINING (Bid Currency) (Lump Sum for 06 CAAQMS)		
GRAND TOTAL CONTRACT PRICE (BID CURRENCY/INR) **(I + II + III)**		

Note:

1. ALL LOCAL TAXES, DUTIES & LEVIES ARE PAYABLE AT ACTUAL (EXTRA) BY THE OWNER.

2. QUOTED COST OF O&M OF A CAAQMS FOR EACH YEAR SHOULD BE AT LEAST **12% OF** THE COST OF SUPPLY & INSTALLATION OF THE CAAQMS. IN CASE THE

BIDDER QUOTES O&M COST LOWER THAN 12% OF THE SUPPLY& INSTALLATION COST:

a) TOTAL QUOTED SUPPLY & INSTALLATION PRICE SHALL BE REDUCED AND O&M PRICE SHALL BE INCREASED BY THE SAME AMOUNT, SO AS TO MAKE THE O&M PRICE AS 12% OF THE SUPPLY & INSTALLATION PRICE, KEEPING THE TOTAL QUOTED PRICE AS UNCHANGED.

b) IN SUCH CASE, BREAK-UP PRICE OF VARIOUS COMPONENTS OF THE SUPPLY & INSTALLATION PRICE SHALL BE REDUCED ON PRO-RATA BASIS.

3. SERVICE TAX SHALL BE PAYABLE ONLY ON THE SERVICE PORTION OF O&M COST ONLY (EXCLUDING SUPPLY OF SPARES FOR MAINTENANCE & OVERHAULING) AS INDICATED IN ATTACHMENT – 3A.

ATTACHMENT - 3

<Letterhead of the Bidder>

BID PRICE BREAKUP FOR EQUIPMENT
(CIF) PRICE

S. No.	Item/Analyzer Name	Manufacturer	Country of Origin	Model	Quantity in Nos. / Sets	Unit Price (Bid Currency)	TOTAL Price (Bid Currency)
1	Automatic Ambient CO Analyzer						
2	Automatic Ambient SO_2 Analyzer						
3	Automatic Ambient NO_X Analyzer						
4	Automatic Ambient NH_3 Analyzer						
5	Automatic Ambient O_3 Analyzer						
6	PM_{10} Monitor						
7	$PM_{2.5}$ Monitor						
8	BTEX Analyzer						
9	Multi-calibration systems for gaseous monitors comprising of gas supply/generation and automated calibration						
10	Meteorological Instrumentation comprisingWinddirection, Wind speed, Ambient Temperature, Relative Humidity, Solar Radiation and Rainfall mounted ontelescopingcrank-up meteorological Mast.						
11	Computer system consisting of one PC along with Laser Printer and DAS at the monitoring station and one at central office with all necessary IT peripherals and software for data acquisition / Data display Board / transfer and system integration, telephone, Modem.						
12	Housing/ Container for Continuous Automatic Monitoring Stations with Samplingline,Internal fitting, Instruments racks, Electrical fittings and Gas line fittings, Tools (electrical andmechanical),						

S. No.	Item/Analyzer Name	Manufacturer	Country of Origin	Model	Quantity in Nos. / Sets	Unit Price (Bid Currency)	TOTAL Price (Bid Currency)
	Data display system, recommended spares						
13	2.0 Ton Capacity Split Air Conditioner						
14	1.0 Ton Capacity Split Air Conditioner						
15	Online UPS 10 kVA capacity (Three-phase I/P and Single Phase O/P) (1-hr backup)						
16	Online UPS 5 kVA capacity (Single-phase I/P and Single Phase O/P) (2-hr backup)						
17	RCC Foundation, pillars and miscellaneous works including civil and electrical						
18	Security Cabin						

ATTACHMENT –3A

<Letterhead of the Bidder>

BID PRICE BREAKUP FOR O&M OF CAAQMS' FOR TEN YEARS

S. No.	Year of O&M	(i) Service charges (70%) for O&M (in Rs.)		(ii) Cost of incidental charges (30%) consisting of security, electricity, phones/internet, manpower, AMCs material including spares & consumables for Operation & Maintenance and others (in Rs.)		TOTAL CHARGES for the year (in Rs.) (i) + (ii)	
		Cost of one CAAQMS	Cost of 06 CAAQMS	Cost of one CAAQMS	Cost of 06 CAAQMS	Cost of one CAAQMS	Cost of 06 CAAQMS
1	1st year						
2	2nd year						
3	3rd year						
4	4th year						
5	5th year						
6	6th year						
7	7th year						
8	8th year						
9	9thyear						
10	10thyear						
TOTAL							

Total Bid Price of one CAAQMS shall be transferred to Attachment 2 under Column "Value per CAAQMS"

NOTE:

A. **SERVICE TAX SHALL BE PAYABLE ON THE SERVICE PORTION OF O&M COST ONLY (EXCLUDING SUPPLY OF SPARES FOR MAINTENANCE & OVERHAULING).**

B. **COST OF MATERIAL INCLUDING SPARES & CONSUMABLES FOR OPERATION & MAINTENANCE SHALL BE INCLUSIVE OF ALL TAXES & DUTIES.**

SECTION V

GENERAL CONDITIONS OF CONTRACT (GCC)

SECTION V

GENERAL CONDITIONS OF CONTRACT (GCC)

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GENERAL CONDITIONS OF CONTRACT (GCC)

1.0 DEFINITIONS

1.1. "The Project" or "The Works" mean Supply, Installation, Commissioning of equipment for Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and 10 years of Operations & Maintenance (O&M) of this CAAQMS at the pre-defined locations in Delhi.

1.2. "DPCC" means the Delhi Pollution Control Committee, having its office at 5th floor, ISBT Building, Kashmere Gate, Delhi-06 and shall include any person or persons authorized by the DPCC.

1.3. "The Contract" means the written agreement to be concluded between the DPCC 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 DPCC.

1.4. "The Contractor" means the Bidder, whose Bid for the Works has been accepted by the DPCC and includes his representatives, successors and authorized assignees.

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

1.6. "The Equipment" means all kinds of materials, machinery, components, apparatus, articles and instruments for the Project to be provided by the Contractor to the DPCC under the Contract.

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

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

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

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

1.11. "The Specifications" means the specifications of the Works to be performed by the Contractor in conformity with those specified in the Technical Specifications of Section VII 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 DPCC through the Consultant in case prior to the Contract and agreed upon by both the DPCC and the Contractor after the Contract.

1.12. "The Sites" means CAAQMS at the defined locations in Delhi.

2.0 INTENT OF CONTRACT

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

2.2 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 DPCC and Contract to be concluded between the DPCC and the Contractor.

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

4.0 USE OF CONTRACT DOCUMENTS AND INFORMATION

4.1 The Contractor shall not, without the DPCC'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 DPCC and their authorized personnel and body in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

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

4.3 Any document other than the Contract itself, enumerated hereinabove shall remain the property of the DPCC and shall be returned to the DPCC on completion of the Contractor's performance under the Contract if so required by the DPCC.

5.0 LOCATION

As defined in Scope of Works (S/W) of this document by the DPCC in Delhi.

6.0 LANGUAGE AND CALENDAR

6.1 **Language**

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

6.2 **Calendar**

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

7.0 SITE CONDITION

7.1 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.

7.2 Access to Site

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

8.0 COUNTRY OF ORIGIN

8.1 All the Equipmentsupplied under the Contract shall have their origin in the eligible countries.

8.2 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.

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

9.0 SPECIFICATION OF EQUIPMENT

9.1 Equipment

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

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

9.2 Specification of Equipment

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

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

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

10.0 CODE AND STANDARD

10.1 Code and Standard

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

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

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

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

10.2 Metric System

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

11.0 ELECTRICAL RATINGS

11.1 Electrical Rating

The 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.

11.2 Precautions 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. If any failure, the loss will be incurred by contractor/bidder.

12.0 NAME PLATE

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

13.0 PACKING AND MARKING

13.1 Packing

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

13.2 Marking

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

13.3 Packing List

Contents of each package and/or the Equipment shall be itemized on a detailed list showing the exact weight, and extreme outside dimensions of length, width and height of each package and/or the Equipment. One copy of the detailed packing list indicating 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.

14.0 SHIPMENT

14.1 Shipment

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

14.2 Shipping Documents

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

14.3 Unloading and Custom Clearance

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

14.4 Inland Transportation

The Contractor shall be fully responsible for the delivery of all the Equipment to the Sites.

The Contractor shall arrange at his option and cost for the transportation from the port of entry to each Site for the equipment of foreign origin.

Transportation of Radioactive material if any shall be carried out by the contractor.

14.5 Handling and Storage

The Contractor shall protect the Equipment from any damage and avoid overloading. Particular attention shall be given to the perishable Equipment and those which must be kept dry, cool or from exposure to direct sunshine and moisture.

In case a part of the DPCC'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 DPCC for temporary occupation and protect facilities against any damages. Charges payable for this facility to the DPCC for this shall be fixed by the DPCC.

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 DPCC 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 DPCC.

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 schedule specified here above.

17.0 PROJECT FORMATION

17.1 Owner

Member Secretary, Delhi Pollution Control Committee

The authorized personnel of DPCC for the Project who is responsible for any coordination with the Contractor is:
In-charge Air Laboratory,
Delhi Pollution Control Committee,
5th Floor, ISBT Building Complex, Kashmere Gate,
Delhi-110006, India.

18.0 WARRANTY / O&M CONTRACT

18.1 All the CAAQMS' shall be under O&M Contract from the date of commissioning of the CAAQMS. The detail terms and conditions and scope of work during O&M Contract Period shall be as specified in the Scope of Work i.e. Section-II of this document.

18.2 However, the Contractor shall warrant to the DPCC that the Equipment to be supplied under the Contract is new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract.This warranty includes all spare parts and services to keep the instruments and equipment in operating condition. In case O&M is not awarded / terminated the equipment shall remain warranted for 10 years from date of commissioning of the station.

The Contractor shall further warrant to the DPCC 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.

18.3 **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.

18.4 **In Case of Faulty Equipment**

If any part of the Equipment breakdowns or fails due to faulty or improper design, materials, workmanship, manufacture, fabrications or instructions, or fails to meet the requirements of the Specifications, then the Contractor or his O&M partner shall promptly notify the manufacturer in writing of any claims arising under this clause.

Contractor or his O&M partner shall ensure that within the period specified in Scope of Work for O&M Contract in Section-II of the document and with all reasonable speed, the repair or replacement of the defective Equipment or improper parts thereof is carried out at the Contractor's expenses.

In the event that any part of the Equipment becomes defective due to no fault of the Contractor, such as voltage fluctuations, misuse and negligence, the Contractor will be indemnified by the DPCC in respect of repair thereof.

18.5 **Manufacturer's Warranty**

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

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 and training involved with the Works naming the DPCC as the beneficiary, in the manner specified in the SCC, until issuance of taking over certificate.

20.0 INSTALLATION

20.1 All the Equipment shall be installed and brought into suitable conditions for operation by the Contractor at the Sites designated by the DPCC. 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 3.0 of S/W in order to install the Equipment in adequate conditions for operation.

All matters omitted from this Clause which may reasonably be incurred to be obviously necessary for the proper installation and operation of the Equipment shall be deemed to be included in this installation works, and the Contractor shall be held responsible for any errors or defects which the Contractor may make due to such omissions thereof.

20.2 Only the best installation practices are to be applied, and all the installation works must be done to the satisfaction of the DPCC 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.

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

20.4 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 and laboratories where the Equipment are to be installed so as to make good arrangement for installation and utility assembly in consultation with the DPCC.

21.0 INSPECTION AND TEST

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

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

21.3 If any inspected or tested Equipment fail to conform to the Specifications, the DPCC 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 DPCC.

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

- Performance Sheet Certificate of all analyzer/UPS/1.2 mm pre-coated GI Sheet of container, NIST traceability for gas Aluminum cylinders/Permeation tube
- Certificate of Traceability
- Verification of System Completeness.
- Product Certificate

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

The DPCC's right to inspect, test and, where necessary, reject the Equipment after the Equipment's arrival in India shall in no way be limited or waived by reason of the Equipment having previously been inspected, tested and passed by the DPCC prior to the Equipment's shipment from the country of origin.

22.0 TRAINING

22.1 The Contractor shall provide the DPCC staff with the training as specified in S/W for the Equipment & Technical Specification.

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

23.0 COMPLETION

23.1 Taking Over

Upon successful completion of delivery, installation, inspection and training of the Equipment to and at the designated Sites and O&M of the CAAQMS for the period specified in SCC, the Contractor shall notify the DPCC in writing that all the Works under the Contract have been completed at least 30 days before expiry of O&M Contract period.

Immediately after completion of O&M Contract period as specified in SCC, the DPCC 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 DPCC. 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 DPCC.

25.0 PAYMENT

25.1 Payment

The method, terms and conditions of payment to be made to the Contractor under this Contract shall be specified in SCC.

The Contractor's request(s) for payment, as appropriate, the Equipment delivered and the Works performed and fulfilment of other obligations stipulated in the Contract shall be made to the DPCC in writing, accompanied by documents specified in SCC. The payment shall be made promptly by the DPCC after submission of required documents along with acceptance certificate.

26.0 PRICES

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

27.0 ASSIGNMENT

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

28.0 DELAYS IN THE CONTRACTOR'S PERFORMANCE

28.1 Delays in the Contractor's Performance

Delivery of the Equipment and performance of the Works shall be made by the Contractor in accordance with the time schedule specified in the SCC.

28.2 Notification of Delay

If at any time during performance of the Contract, the Contractor and/or the Manufacturer should encounter conditions impending timely delivery of the Equipment and performance of the Works, the Contractor shall promptly notify the DPCC 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 DPCC 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 DPCC by amendment of the Contract.

28.3 Liability of Liquidated Damages

Except as provided under Clause 39.0 i.e. "Liquidated Damages" 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 32.0 i.e. "Suspension of Work" of GCC hereunder, unless an extension of time is agreed upon pursuant to Sub-clause 28.2 "Notification of Delay" hereabove without the application of Liquidated damages.

29.0 SUSPENSION OF WORK

The Contractor shall not suspend the whole or any part of the Works without notice to the DPCC in writing. The Contractor thereupon shall do all possible endeavors to reduce any expenses or costs resulting from the suspension. Such suspension shall not nullify the Contract.

30.0 TERMINATION FOR DEFAULT

30.1 Termination for Default

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

1) If the Contractor fails to perform any or all of the Works within the period specified in Clause 11.0 of SCC, or extension thereof granted by the DPCC pursuant to Clause 28.0 and other related clauses of GCC.

or

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

30.2 Liability for Excess Cost for Unperformed Work

In the event the DPCC terminates the Contract in whole or in part pursuant to Sub-clause 32.0and other related clauses of GCC here after the DPCC 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 DPCC for any excess costs for such similar equipment/ works**.** However, the Contractor shall continue performance of the Contract to the extent not terminated.

31.0 FORCE MAJEURE

31.1 Notwithstanding the provisions of Clauses 29.0, 30.0 and 32.0 in GCC, the Contractor shall not be 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.

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

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

32.0 TERMINATION FOR INSOLVENCY

The DPCC at any time terminates the Contract by giving written notice to the Contractor if the Contractor becomes bankrupt or otherwise insolvent. In this event, termination will be without

compensation to the Contractor, provided that such, termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the DPCC.

33.0 TAXES AND DUTIES

a) Concessional Customs Duty shall be applicable on the equipment being imported. Necessary exemption certificate shall be issued by DPCC and applicable Custom Duty shall be paid by bidder.
b) DPCC is also exempted from paying Excise Duty. Necessary exemption certificate shall be issued by the DPCC.
c) GST, Local taxes i.e. entry tax, octroi, etc. shall be paid by the bidder.
d) GST and Service Taxes as applicable on incidental services like Installation, Commissioning and Training and O&M service etc. shall be payable extra by DPCC.

34.0 INJURY AND DAMAGE

34.1 Injury or Death of Persons

The Contractor shall be liable for and shall indemnify the DPCC 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 DPCC or of any person for whom the DPCC is responsible.

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

34.2 Damage to Property

The Contractor shall be liable for and indemnify the DPCC against, and insure and cause any Manufacturers and subcontractors to insure against, any expense, liability, loss claim or proceedings in respect of any damage whatsoever to any real or personal property for any one occurrence in so far as such damage arises out of or in the course of or by reason of the carrying out of the Works and is due to any negligence, omission or default of the Contractor or any person for whom the Contractor is responsible or any Manufacturers and subcontractors or person for whom the Manufacturers and subcontractors are responsible.

35.0 ROYALTY AND PATENTS

35.1 The Contractor shall pay all royalties and licenses fees for the use of any patented item, whether it may be an invention, method, arrangement, article, process or appliance used in connection with the performance of the Contract. The Contractor shall indemnify and save harmless the DPCC 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 or sale of any of the inventions, methods, arrangements, articles, processes or appliances used in connection with the performance of this Contract infringes any patent or such other rights. The Contractor

shall, at the request of the DPCC, defend the DPCC against any suit brought to enforce any such claim at the Contractor's expense.

35.2 In case any such patented item used on or in conjunction with the Works is in suit held to constitute and infringement of its use enjoined, the Contractor shall either secure for the DPCC the right to continue using the said item by suspension of the enjoinment, by procuring for the DPCC 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 theDPCC's approval remove the said enjoined item and refund to the DPCC the sums paid thereof.

36.0 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.

37.0 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 Delhi shall have exclusive jurisdiction in all matters arising under this Contract.

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

38.0 NOTICES

Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by cable, telex, facsimile, email 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.

39.0 LIQUIDATED DAMAGES

If the Contractor fails to perform the Works within the period specified in Clause 11.0 of SCC, the DPCC shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in SCC. Once the maximum is reached, DPCC may consider termination of the Contract pursuant to Clause 32.0 i.e. 'Termination for Insolvency' of GCC.

SECTION VI

SPECIAL CONDITIONS OF CONTRACT (SCC)

SECTION VI

SPECIAL CONDITIONS OF CONTRACT (SCC)

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SPECIAL CONDITIONS OF CONTRACT (SCC)

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

1.0 CLIMATE CONDITION

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

2.0 CONSUMABLES AND SPARE PARTS

2.1 **Supply of Consumables and Spare Parts**
The Contractor shall provide the consumables and spare parts as per requirement of Operation &Maintenance of CAAQMS Stations.

2.2 **After-Sales Service**
The Contractor shall guarantee the availability of all consumables, spare parts, maintenance and repair work for each Equipment and IT hardware (server, communication links etc.) and requisite software along with equipment at cost basis for at least ten (10) years O&M period as specified in Clause 7.0 of SCC, unless otherwise specified in the Specifications.

Bidder should submit certificates from the manufacturers in support of available service centersand availability of spares parts and consumables in India as per Attachment-2B of Section III.

3.0 NAME PLATE (GCC CLAUSE 12.0)

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 DPCC

4.0 MARKING (GCC SUB-CLAUSE 13.2)

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

1) Consignee : <Address of DPCC>, India

2) Name of the Works : Supply and O&M of Continuous Ambient Air Monitoring Stations (CAAQMS) for DPCC at……
3) Name of the Project : Supply and O&M of Continuous Ambient Air Monitoring Stations (CAAQMS) for DPCC at……
4) Contract Number
5) Contractor's Name& Ph. Number
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 DPCC

5.0 SHIPMENT (GCC CLAUSE 14.0)

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

5.1 **Notification and Submission of Documents**

Upon shipment, the Contractor shall notify DPCC and the Insurance Company by providing the following details of the shipment:

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

5.2 The Contractor shall mail the following document to the DPCC, with a copy to the Insurance Company:

(1) Equipment of Foreign Origin

(i) Four (04) copies of the Contractor's invoice showing the Equipment's description, quantity, unit price and total amount

(ii) Original and Four (04) copies of the negotiable, clean, on-board bill of lading marked freight prepaid and four (04) copies of non-negotiable bill of lading;

(iii) Four (04) 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 DPCC at least one week before arrival of the Equipment at the port or place of arrival and if not received, the Contractor will be responsible for any consequent expenses.

Partial shipment and transshipment is allowed.

(2) Equipment to be Supplied from within India

Upon delivery of the Equipment to the transporters, the Supplier shall notify the DPCC and mail the following documents to the DPCC:

(i) Four (04) copies of the Supplier's invoice showing the Equipment's description, quantity, unit price and total amount.

(ii) Acknowledgment of receipt of goods from the consignee i.e. receipted delivery note, railway receipt (RR), or lorry receipt (LR)

(iii) Supplier's and/or Manufacturer's Warranty Certificate

(iv) Factory Test & Inspection Certificate issued by the Competent Authority

(v) Insurance Certificate

(vi) Certificate of Country of Origin

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

6.0 WORKS SCHEDULE (GCC CLAUSE 16.0)

6.1 Equipment to be Supplied from Foreign Country

Delivery Period for all the packages shall be **Thirty (30) days from the date of notification of award**. It relates to completion of delivery on CIF (designated Sea Port / Air Port) basis for equipment of foreign origin. Further transportation to the site where the CAAQMS's is to be installed and commissioned shall be completed by the contractor **within Fifteen (15) days from the date of arrival of equipment at** port of de-embarkment.

6.2 Equipment to be Supplied from India

All the equipment **shall be received** at Continuous Ambient Air Quality Monitoring Station Site, **within 30 days from the date of notification of award** and are to be installed and **commissioned within Fifteen (15) days from date of receipt at site**.

6.3 Commissioning and other incidental services

All the equipment of the awarded package shall be commissioned **within 45 days from the date of notification of award including** all the incidental servicesi.e. training etc.

6.4 O&M Contract

The contractor shall carry out Operation & Maintenance of Air Monitoring Stations for a period of **ten (10) years from the date of commissioning** of the station.

7.0 WARRANTY / O&M CONTRACT (GCC CLAUSE 18.0)

7.1 Period of O&M Contract

The complete CAAQMS shall be under Operation & Maintenance (O&M) 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 (O&M) Contract. The Contractor shall, in addition, comply with the performance guarantees if specified under the Contract. If, for reasons attributable to the Contractor, these guarantees are not attained in whole or in part, the Contractor shall make such changes, modifications, and/or additions to the Equipment or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own costs and expenses and to carry out further performance test.

8.0 INSURANCE (GCC CLAUSE 19.0)

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 DPCC on "All Risks" basis, including war risks and strikes, naming the DPCC 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 20.0)

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

10.0 INSPECTION AND TEST(GCC CLAUSE 21.0)

10.1 Unpacking Inspection

Unpacking inspection shall be performed by the Contractor to inspect whether all the items and quantity of the Equipment have been delivered in conformity with the Equipment and packing list without any damage during the shipment.

The Contractor shall submit the unpacking inspection report to the DPCC.

10.2 Site Inspection

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

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

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

10.3 **Performance Test**

The Contractor shall carry out the performance test to inspect and witness the function of each of the equipment supplied under the awarded package at site.

Performance test shall be carried out in accordance with relevant clause of S/W for all the Equipment supplied.

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

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

In case of results of such performance test found to be unsatisfactory by the DPCC, same shall be promptly remedied by the Contractor.

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

The Contractor submits the performance test report to the DPCC.

11.0 COMPLETION (GCC CLAUSE 23.0)

The supplier has to install and commission CAAQMS along with training to DPCC Lab personnel **within period of 45 days from date of issue of notification of award**, if it is not completed within 45 days Liquidated Damages (LD) clause will be applicable as per clause 16.0 of SCC.

12.0 SUBMISSION OF DOCUMENTS (GCC CLAUSE 24.0)

12.1 **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 DPCC indicating the following items:

a) Equipment supply program and Equipment Layout Plan (if applicable)

b) Design drawings and utility list, if required.

c) Subcontractor list for installation work of the Equipment, if not already specified in the Techno-Commercial Bid.

d) Program for factory, pre-shipment, unpacking, and site inspections and performance test.

e) Installation program including personnel organization chart of the Contractor.

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

12.2 Other Documents

The Contractor shall submit the following documents within thirty (30) days after the Notification of Award.

Item	Number of Documents to be submitted to DPCC per station
Catalogues, Product Data and test reports	02
Installation Manuals	02
List of consumables and spare parts	02
Manufacturer's Specifications	02
Training Program	02

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

Item	Number of Documents per station	Time of Submission
Inspection Report	02	At the time of completion of factory, pre-shipment unpacking and site inspections (if applicable)
Training Manual	06	At the time of commencement of installation of Equipment
Operation & Maintenance (O&M) Manual	06	At the time of commencement of installation of Equipment
Training Program	01	At the time of completion of installation of Equipment
Report of Performance Test	01	At the time of completion of Performance Test
Video CD (Optional)	01	By the time of commencement of training
List if Equipment Supplied	02	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 DPCC.

13.0 PAYMENT (GCC CLAUSE 25.0)

13.1 Method of Payment

The payment shall be made in the currency specified in the contract for equipment.

Other payment shall be made through NEFT/Cheque only.

13.2 **Terms and Conditions of Payment**

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

(a) Payment for goods and services (excluding O&M charges):

(i) Fifty (50) percent value of the Contract Price for Goods and Services (excluding O&M) shall be payable after successful installation (to be certified by DPCC) of CAAQMS.

(ii) The next Fifteen (15) percent value of the Contract Price of Goods and Services (excluding O&M) shall be payable after satisfactory commissioning and training (to be certified by DPCC).

(iii) The next Fifteen (15) percent value of the Contract Price of Goods and Services (excluding O&M) shall be payable after satisfactory (to be certified by DPCC) completion of the Operation & Maintenance (O&M) work of the first year.

(iv) BalanceTwenty (20) percent (i.e. 2.22% for each year = 20%)valueof the Contract Price of Goods and Services (excluding O&M) shall be payable after satisfactory(to be certified by DPCC)completion of the Operation & Maintenance (O&M) work for the subsequent 9 years.

(b) Payment of Operation and Maintenance (O&M) charges:

O&M cost of each year shall be paid after end of every quarter in equal instalments based on submission of required air quality report 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 26.0)

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 DPCC.

15.0 PERFORMANCE SECURITY

The amount of Performance Security shall be as follows:

(i) 10% of the value of contract for supply part valid till 90 days after the successful installation and commissioning of all 06 CAAQMS.

(ii) 10% of the value of contract for O&M services valid up to 90 days beyond O&M Period of 10 years

(iii) CPB for supply part shall be released after submission of CPG for O&M services.

The Performance Bank Guarantee shall be in favour of Delhi Pollution Control Committee, Delhi.

16.0 LIQUIDATED DAMAGES (GCC CLAUSE 39.0)

16.1 **Rate**

The Contractor shall pay to the DPCC as liquidated damages a sum equivalent to half (0.5) percent of the contract price (supply portion) of each station for per week of delay in commissioning of each station.

16.2 **Maximum Deduction**

The total liquidated damages on account of delay in supplies payable to the DPCC shall not in any case exceed ten (10) percent of the Contract price of supply portion only (Excluding O&M charges).

16.3 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 (Scope of Work) of this document.

17.0 NOTICES (GCC CLAUSE 39.0)

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:

Owner:

Member Secretary, Delhi Pollution Control Committee

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

In-charge Air Laboratory,
Delhi Pollution Control Committee,
5th Floor, ISBT Kashmere Gate Building,
Delhi, India-110006

ATTACHMENT – 1A

FORM OF BANK GUARANTEE FOR PERFOMANCE SECURITY
(FOR SUPPLY OF EQUIPMENT)

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

Bank Guarantee No.: ……..

Ref. No. : …….. Date : ……..

To,
Member Secretary,
Delhi Pollution Control Committee,
5th floor, ISBT Kashmere Gate Building
Delhi-110006
Contact Person: Dr. Nandita Moitra, In-charge Air Lab (M. No. 9717593521)

Dear Sirs,

THIS AGREEMENT is made on the ……day of…….2025 between <Name of the Bank and Address>(hereinafter called "the Guarantor") of the one part and Delhi Pollution Control Committee, Delhi, India (hereinafter called "DPCC") of the other part.

WHEREAS

(1) This agreement is supplemental to a contract number <Contract Number> (hereinafter called "the Contract") made between the <Name and Address of the Contractor> (hereinafter called "the Contractor") of the one part and the DPCC of the other part whereby the Contractor agreed and undertook to execute the works of Supply and O&M of 06 nos. Continuous Ambient Air Quality Monitoring Stations (CAAQMS) for DPCC as against the Contract for the sum <Amount in Contract Currency in figures > (<Amount in Contract Currency in words >) being the Contract Price; and
(2) The Guarantor has agreed the due performance of the Contract in the manner hereinafter appearing.

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

(a) If the Contractor (unless relived from the performance by any clause of the Contract or by statute or by the decision of a tribunal of competent jurisdiction) shall in any respect fail to execute the Contract or commit any breach of his obligations thereunder then the Guarantor will indemnify and pay the DPCC the aggregate sum of <Amount of Guarantee shall be 10% of the said value of the Contract – in figures and words>, such sum being payable in the types and amount of currencies in which the Contract Price is payable, provided that the DPCC or his Authorized Representative has notified the Guarantor to that effect and has made a claim against 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 DPCC, with or without the consent of the Guarantor, or by any alteration in the obligations undertaken by the Contractor, or by any forbearance on the part of the Contractor, whether as to payment, time, performance, or otherwise, any notice to the Guarantor of any such arrangement, alteration, or forbearance is hereby expressly waived.

This guarantee shall be valid **up to forty-five(45) days** after the date of expiry of one year O&M period as specified in the Contract.

Give 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 - 1B

PROFORMA FOR BANK GUARANTEE TO BE FURNISHED BY O&M PARTNER

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

Bank Guarantee No. : ……..

Ref. No. : …….. Date : ……..

In consideration of Delhi Pollution Control Committee (DPCC) (hereinafter referred to as "the Employer" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s…… with its Head Office at……. (hereinafter referred to as "the Contractor") a Contract forSupply and Operation & Maintenance of 06 nos. Continuous Ambient Air Quality Monitoring Stations (CAAQMS) vide Contract No. …….dated……. and the same having been unequivocally accepted by the Contractor resulting in a "Contract", which award is on the strength of Form of Certificate by the O&M Partner in India for carrying out the O&M of CAAQMS' dated…… (hereinafter referred to as "Undertaking") given by M/s <O&M Partner> having its registered office at ……. (hereinafter called "O&M Partner"), and the Contractor having further executed with <O&M Partner> a Sub-Contract dated……and the same having been unequivocally accepted by the O&M Partner resulting in a Sub-Contract Agreement for ……. (hereinafter called "Sub-Contract Agreement") and <O&M Partner> having agreed to provide a Performance Guarantee amounting to 10% of the Total Contract Price in addition to the Contract Performance Security to be provided by the Contractor to the employer on the terms and conditions specified in the "Undertaking".

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

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

The Bank also agrees that the Employer at his option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against Contractor or O&M Partner and not withstanding any security or other guarantee that the Employer may have in relation to Contractor's or O&M Partner's liabilities.

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

Date this …… Day of…….2025…….at…….

WITNESS:

<Signature>
<Name>
<Official Address>

<Signature>

<Name & Designation>

<Bank's Seal>

Authorised vide Power of Attorney No. ……

<Date>

(@) The date will be ninety (90) days after the end of the complete O&M Period.

Note:

1. The stamp papers of appropriate value shall be purchased in the name of the guarantee issuing bank.
2. The Bank Guarantee from a Bank in the list of banks in the Attachment-13 to Section-III of bid document.

ATTACHMENT – 2

FORM OF CONTRACT AGREEMENT FOR SUPPLY AND OPERATION & MAINTENANCE OF CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS (CAAQMS)

This Supply and Operation & Maintenance Agreement ("Agreement") is madeon this ……. day of……2025 by and between:

Delhi Pollution Control Committee, with Office at 5th floor, ISBT Kashmere Gate Building, Delhi, India-110006 which term shall include permitted assigns and successors (Hereinafter called as "DPCC" 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 (O&M) of 06 nos. Continuous Ambient Air Quality Monitoring Station (CAAQMS) located in Delhi

and M/s……. had submitted their bid against the aforesaid invitation to bid and the Owner has accepted the bid of M/s……. and has decided to entrust the job of Supply and Operation & Maintenance (O&M) of the six (06) nos. Air Monitoring Stations located at Delhi to the Contractor vide Letter of Award ref……. dated……. At a total Contract Price for Complete Scope of Work of <Contract Price in Figures and Words> (Hereinafter called "the Contract Price").

Whereas the Contractor has accepted the Letter of Award issued by the Owner in writing vide its letter n.……. dated…… and has furnished Contract Performance Security for an amount of Rs……./- <Amount in Words> and which is initially valid up to ……. And the Owner has accepted the said Contract Performance Security.

Whereas, Contractor is having expertise in the business inter alia, of supplying and Operation & Maintenance (O&M) of Air Monitoring Stations and the owner has engaged the Contractor to supply and perform operation & 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 WITNESS AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz:
   1) Scope of Works;
   2) Financial Bid;
   3) Technical Specifications;
   4) General Conditions of Contract (GCC);

5) Special Conditions of Contract (SCC);
6) The Notification of Award(s)

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 listed above.

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

4. The DPCC 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 or e-mail. Notices to either party shall be given at such address or addresses as such party shall specify from time to time by written notice to the other. In the absence of such notice to the contrary, notice to the DPCC shall be properly addressed to:

   Member Secretary,
   Delhi Pollution Control Committee,
   5th floor, ISBT Kashmere Gate Building
   Delhi-110006

   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 DPCC's Authorized Representative
……..……..
Signature of the Contractor

Signed, Sealed and Delivered by the said
……..
(For the DPCC) 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 DPCC 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……..
   c) Description of the equipment……..
   d) Package No.……
   e) Quantity……
   f) Bill of Lading…… dated……..
   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:

S. No.	Description	Amount to be recovered

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

4. The Contractor has fulfilled his contractual obligations 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 from the date of intimation by the Purchaser in respect of the installation of the stations.

   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 station have been delayed on act of the Contractor, the extent of delay should always be mentioned.

OR

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

a)
b)
c)
d)

5. The amount of recovery, on account of non-supply of accessories and spares is given under Para No.2

6. 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……

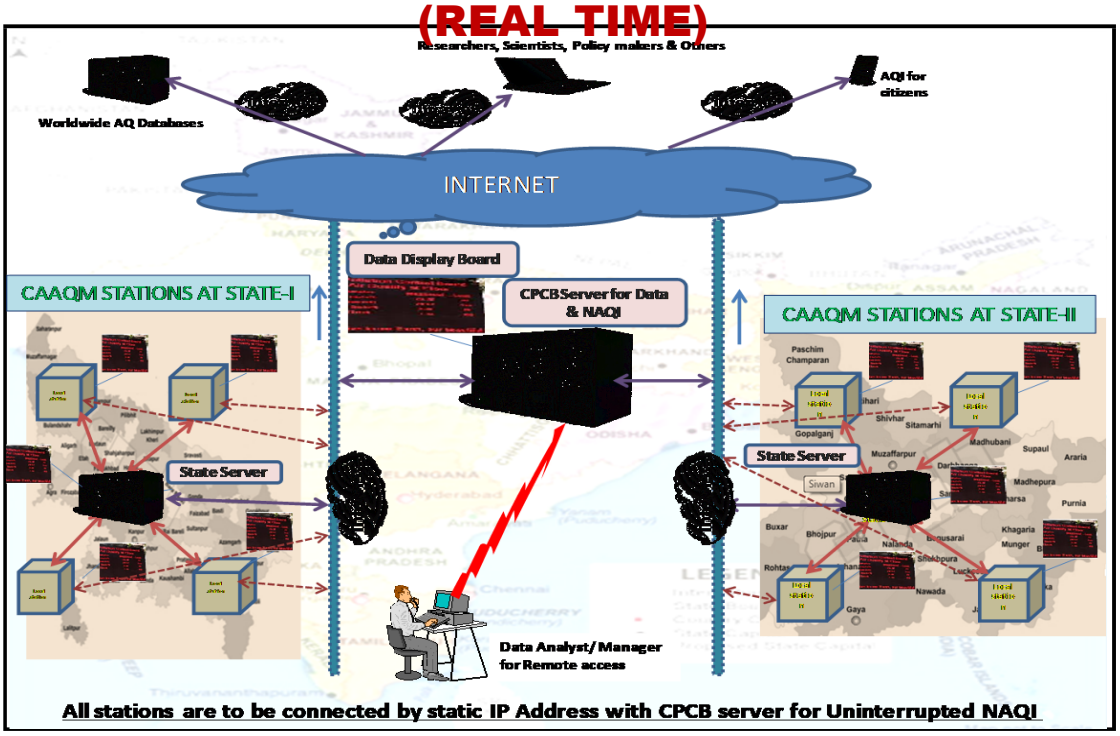
Name……..

Designation with stamp……..

SECTION VII

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS FOR CONTINUOUSAMBIENTAIRQUALITY MONITORING (CAAQM) STATION (REAL TIME)



CentralPollutionControlBoard
EastArjunNagar,Shahdara
Delhi - 110032.

(July,2019)

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MINIMUM REQUIREMENTS FOR A CAAQM STATION

The equipment's are intended for one Continuous Ambient Air Quality Monitoring (CAAQM) Station. The system should be completely functional. Any balance of material not specified but required for the purpose must be supplied by the vendors.

Multiple CAAQM Stations can be connected with one server, SPCBs/PCCs may assess their IT requirement based on the available infrastructure ('Rack Server', 'UTM Device', 'Switch' and 'Day & Night Display Board at SPCB/PCC')

S. No.	Item / Analyzer Name	Total Quantity
1	Monitoring Station foundations	Actual
2	Air Conditioner, Split Type, Wall mounted along with voltage stabilizer (2x2 Ton, 1x1 Ton) at the CAAQM Station	Three
3	On line UPS (1x10KVA, 1 hr. back up and 1x5KVA, 2 hr. back up) at the CAAQM Station	Two
4	Sampling System having 10 port manifold	One
5	19" Rack cabinet to accommodate all analyzers & systems	Three
6	Continuous Ambient Oxides of Nitrogen ($NO/NO_2/NO_x$) Analyzer	One
7	Continuous Ambient Ammonia (NH_3) Analyzer	One
8	Continuous Ambient Sulphur Dioxide (SO_2) Analyzer	One
9	Continuous Ambient Ozone (O_3) Analyzer	One
10	Continuous Ambient Carbon Monoxide (CO) Analyzer	One
11	Continuous BTEX Monitor / Analyzer	One
12	Multi calibration System for Gas calibration and Meteorological, Flow and Electronic Calibration	One set
13	Automatic $PM_{2.5}$ Particulate Matter Monitor	One
14	Automatic PM_{10}Particulate Matter Monitor	One
15	Meteorological Sensors for Wind Direction, Wind Speed, Ambient Temperature, Rainfall, Relative Humidity, Solar Radiation and Telescoping Crank-up Meteorological Tower	One set
16	**IT PERIPHERLS:**	
	(a) Data Acquisition System (DAS): One for each CAAQM Station	One
	(b) Computer System for DAS: One for each CAAQM Station	One
	(c) Computer System for AQI: One for each CAAQM Station	One
	(d) Laser Printer ColourMFP : One for each CAAQM Station	One
	(e) Server Rack: One for each SPCB*	One
	(f) Rack Server: One for each SPCB*	One
	(g) Access Point: One for each SPCB*	One
	(h) UTM: One for each SPCB*	One
	(i) 24Ports CISCO Switch: One for each SPCB*	One
	(j) Central Management Software with License w.r.t Data Acquisition: One for each SPCB*	One
	(k) Remote Calibration & Validation Software: One for each SPCB*	One
	(l) Remote Connectivity Tool/Software: One for each SPCB*	One
17	Data display Board Transmission Device (two nos.)	Two

S. No.	Item / Analyzer Name	Total Quantity
	(One for Data Display Board near to the station and another for data display at the SPCB display board*)	
18	Day & Night Visible Data Display Board (Near to the station)	One
19	Day & Night Visible Data Display Board at the respective SPCB-H.O.*	One
20	Continuous Automatic Monitoring Stations with Sampling line, Internal fitting, Instruments racks, Electrical fittings and Gas line fittings, Tools (electrical and mechanical), Data display system, Recommended spares in a Housing Container	One set
21	Lease Line for Internet AND Broadband (for Station) AND Data Card as mode Communication system (for display Board)	One set
22	RCC foundation, pillars misc. works including Caging, civil & electrical work (for CAAQM stations as well as Data Display Boards)	Actual
23	Security Cabin	Actual

TECHNICAL SPECIFICATIONS

1. CAAQM STATION – HOUSING / CONTAINER

1.1. Housing / Container: It 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. Three Nos. 19" racks shall be installed inside the station so that the analyzers are easily accessible from front & back for calibration and maintenance.

1.1.1. **Dimensions:**

Inside length: 4200 mm
Inside width: 3500 mm
Inside height: 2500 mm
(As per the Drawing given)

1.1.2. **Frame:** All the material used for the construction of the floor, frame, roof frame etc, the 4 corner posts and 8 integrated, reinforced container corners should be of metal. The exterior panel of the container shall be made of pre-coated MS Sheet of approved colour shade. All other steel parts should be hot dipped galvanized having minimum rate of galvanization of 275 gram per square meter (IS277). All joints of like metal such as steel-to-steel or aluminium-to-aluminium shall be protected against corrosion by liberal application of joining compound. All joints of dissimilar metals such as steel to aluminium shall be protected against corrosion due to galvanic action by liberal application of dielectric compound as well as jointing compound on both mating surfaces. For lifting / fixing the container, International Standard eyebolts should be provided at the corners.

1.1.3. **Panelling:** The outer panelling will be of 1.2 mm of Pre-coated MS sheet to withstand external impacts and abrasions. Outer side of the MS Sheet i.e. exposed face of the sheet, shall be permanently colour coated with silicon modified polyester coating of dry film thickness (DFT) 20 micron (min.) of approved colour shade over primer. Inner face of the sheet shall be provided with suitable pre-coating of minimum 7-micron off-white colour. The inner panelling will be of PVC coated 2 mm thick aluminium sheet, fixed over an inlay of 4 mm marine plywood. 100 mm thick polyurethane insulation will be used between the outer and inner walls (Pre-coated MS sheet and Marine plywood) as insulating material. Z spacers if required shall be made out of at least 2 mm thick galvanized steel sheet of grade 275 as per IS:277.

1.1.4. **Floor:** The floor will be laid in frame of 600 x 600 mm centre to centre with 50 x50 x 6 mm MS angle. The floor surface will be of 19 mm marine plywood covered with robust quality Vinyl flooring, 2 mm thick of approved colour. The floor should be of acid and alkaline resistant, waterproof, easily cleanable / washable. Bottom plate of thickness 2 mm hot dipped galvanised MS Plate shall be provided.

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

1.1.6. **Electric Power Supply Box:** Three-phase (3 Ø) electrical wiring will be laid in ducts. Copper wiring of appropriate gauge will be used. The terminal board should be mounted in a central power distribution box. Over voltage protection for each phase shall be provided along with the lightning arrestor. 2 numbers Emergency cut off switch & Thermostat switch (max 35°C) for power disconnection, 6 free sockets and 3 fluorescent lamps for lighting will be provided.

The station shall be properly grounded with chemical earthing or as per BIS Standards with proper plate and only copper strip at least on 2 corners (diametrically opposite). One three-phase energy meter (Digital Type) shall be installed. Weatherproof cubicles / enclosure for housing of MCB / TP&N Switch of main power termination (outside shelter) and weatherproof telephone junction box for terminations of telephone line are to be provided.Proper earthing for telescopic mast of meteorological system shall be provided. There should be conduction between the telescopic mast of the meteorological system and the station. The guy ropes or wires shall be provided for supporting the mast.

List of Consumables:

All Fuses	:	02 set
Lightning arrestor	:	02 set
Emergency Switch	:	02 pcs
Thermostat	:	01 pc

1.1.7. **Partitioning for Calibration Gas Cylinders, Meteorological Mast and UPS:**

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

Air conditioners shall be mounted on proper rust proof supporting structures with rubber blocks to avoid vibration of structures. Proper caging / grill should also be provided for the safety of ACs. Sun shades for external AC units shall be provided with fabricated pre-coated MS sheet (same as monitoring station) with supporting arrangements. AC unit's external piping shall be placed in GI trays. Cable trays fixed on exterior wall shall be covered with pre-coated MS sheet, of same colour shade of monitoring station. Roof top sheet to be levelled and sloped properly. Rain water spout shall be fixed at top with rain water down pipe at two corners. The external lights of the station should be Solar operated.

1.1.8. **Station Furnishing:**

(i) 19" racks – 03 Nos.
(ii) Fire extinguishers – 02 Nos. (Clean Agent – 2 KG each)
(iii) Furniture:

a) Material – Furniture made of water-resistant laminated board.
b) Cupboard – As per drawing
c) Working table – Powdered coated MS frame size 1400 x 900 x 750 mm (w x d x h) and top 19 mm thickness board
d) Revolving tilting chair – 02 Nos.

(iv) Miscellaneous

a) The exhaust gases from the analyser should be collected and discharged by a common exhaust pipe and vented.
b) Folding aluminium ladder for roof access (Length…. with 1 feet width steps)
c) Sensor for measuring the inside temperature of the station and Display
d) Hygrometer for measurement of Humidity inside the station and Display
e) Mounting bracket for the ladder
f) No smoking stickers
g) Vacuum cleaner with minimum 100 Watts power
h) Tool Kit having following tools:
    1. One screw driver set
    2. One Digital multi-meter (Philips, Micro or equivalent make)
    3. One box spanner set
    4. One D spanner set
    5. One watch maker set
    6. One Hammer set
    7. One precision screw driver set
    8. One pliers set
    9. One Tong tester
    10. One Soldering Iron with stand
i) One Emergency LED Cluster Light
j) Sign boards alongwith logo of Central Pollution Control Board, Delhi / State Pollution Control Board, 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 Hindi or local language to be inscribed. The Signs boards to be mounted on the station with proper spacers.

1.1.9. **Container Foundation (RCC)**

L x W :6000 x 6000 mm

Height :300 mm from ground

Pillars: Nine concrete pillars of 300 mm above the ground level and below the ground level with 200 x 200 mm beam and between pillar bricks to be used for filling the space(concrete ratio of 1:2:4). Outer wall of the foundation to be plastered with 1:4 Cement:Sand ratio and same has to be painted with weather proof coat.

Top of the platform: RCC 150 mm with concrete ratio of 1:1:2 and to plaster and painted with weather proof paint.

Staircase: RCC Steps to approach the main door of the container and the UPS / Gas room door in the side to be provided and each step should not be more than 150 mm

1.1.10. **Security Cabin**

A 4 feet x 4 feet wooden / Panelled security cabin with chair and small folding table for security guard with covered overhead selves to be provided separately with the station container.

2. SPLIT AIR CONDITIONER

2.1. SPLIT AIR CONDITIONER (2.0 TON CAPACITY)

2.1.1. Type &Capacity: 2 Nos. split type, 2-ton cooling only capacity Inverter AC, roof/wall mounted of 5-star rating with an automatic timer. Separate Automatic Voltage stabilizer will be provided with each unit.

2.1.2. The indoor units should be running alternately at an interval of four hours with timer control and the temperature inside the station should be maintained at 25°C inside during all the time including peak summer months.

a. Cooling Capacity :7000 W
b. Star Rating : BEE 5-star Inverter with Cooper Coil
c. Indoor Noise Level : 40-50 dB(A) (cooling)
d. Control Type : Remote
e. Compressor : Inverter
f. Refrigerant : Eco Friendly
g. Feature : filter clean Indicator, defrosting Sensor
h. Power supply : 230Volts ± 10Volts AC and 50 Hz±3%
i. Standard Warranty
j. Remote : LCD Wireless.

2.2. SPLIT AIR CONDITIONER (1.0 TON CAPACITY)

2.2.1. Type & Capacity: 1 Nos. split type, 1 ton cooling only capacity Inverter AC, roof/wall mounted of 5-star rating with an automatic timer. Separate Automatic Voltage stabilizer will be provided with each unit.

2.2.2. 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°Cinside during peak summer months.

a. Cooling Capacity :3400 W
b. Star Rating : BEE 5-star Inverter with Cooper Coil
c. Indoor Noise Level : 40-50 dB(A)
d. Control Type : Remote

e. Compressor : Inverter
f. Refrigerant : Eco Friendly
g. Feature : filter clean Indicator, Pre-coated Aluminium fins etc.
h. Power supply : 230Volts ± 10Volts AC and 50 Hz±3%
i. Standard Warranty
j. Remote : LCD Wireless.

3. ONLINE UNINTERRUPTED POWER SUPPLY (UPS)

3.1. ONLINE UPS 10 kVA, CAPACITY (Three-Phase I/P &Single-Phase O/P, with 01 hours backup) (for Air Conditioner)

Three-phase 10 kVA UPS along with Automatic Delayed Restoration Device (ADRD) with 1 hour backup in full capacity should be provided for the smooth operation of one 2-Ton capacity split AC at the station. Automatic Phase Sequencer Device has tobe installed along with the UPS.

3.1.1	Capacity		10.0 kVA
3.1.2	Technology		PWM using IGBT / MOSFETS
3.1.3	Crest Factor		More than 3:1
3.1.4	Input	Voltage	415 V AC
		Voltage Range	± 25%
		Frequency	50 Hz ± 3%
3.1.5	Output	Voltage	230 V AC
		Voltage regulation	± 1%
		Frequency	50 Hz
		Frequency regulation	± 0.01%
		Waveform	Pure sine wave
3.1.6	Battery	Battery type	Sealed maintenance free
		Back up time	1 Hour at full load
		Battery Capacity	For required backup time
		Recharge time	5 hrs to 90% after complete discharge
3.1.7	Distortion		Less than 1% on linear load
3.1.8	Power factor		0.9 to 1
3.1.9	Indicator		L.E.D. – Battery Charge, Load level, on Line, over load, on battery, replace battery
3.1.10	Alarm		Audible alarm for batterybackup, battery low, and fault
3.1.11	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 drain after cut-off
3.1.12	Overload Capacity		110% for continuous load
3.1.13	Efficiency		More than 90%

3.1.14	Environment	Operating Temperature	0 – 50°C
		Operating Humidity	10% to 95% (Non condensing)
		Audible Noise	Less than 45 dB (at 1 meter)

3.2. ONLINE UPS 5 kVA, CAPACITY (Single-Phase I/P &Single-Phase O/P, with 02 hours backup) (01 for Analysers& 01 for Server at Central Station)

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

3.2.1	Capacity		5.0 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	230 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 complete 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, on Line, over load, on battery, replace battery
3.2.10	Alarm		Audible alarm for batterybackup, 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 drain 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°C
		Operating Humidity	10% to 95% (Non condensing)
		Audible Noise	Less than 45 dB (at 1 meter)

4. CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYSERS for SO_2, NO-NO_2-NO_x, NH_3, CO, O_3, and BTEX

4.1. (General Specifications for all Analysers)

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

4.1.2. The front panel preferably have ON / OFF Switch.

4.1.3. The display of the entire important status signal viz. Sample flow, temperature, concentration, range selection, manual / auto mode, zero / span mode and all error messages should be on front panel.

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

4.1.5. The analyzers must function properly in Indian conditions without any defect between 0 – 40°C ambient temperature, 10 – 95% relative humidity and in high ambient dust levels. The data capture rate should not be less than 90% of operational time.

4.1.6. The Manufacturer shall provide comprehensive hands-on training for operational & preventive maintenance for one week in the respective State for three persons per station.

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

CALIBRATION GAS CYLINDER

4.1.8. **The supplier has to supply the calibration gas cylinder (highly polished aluminum 10 liters water capacity), along with SS Regulator, traceable to NIST for each components (SO_2, NO, CO, NH_3, Benzene & Toluene) along with SS regulator for the multipoint calibration.** The synthetic air and N_2 cylinder (99.99% purity with certificate) should be in Carbon Steel cylinder of 47 Liters water capacity along with SS Regulator.

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

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

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

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

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

- Parts (I) should comprise installation, operational and troubleshooting details;
- Parts(II)should have details about preventive, routine and corrective maintenance;
- Parts(III)should comprise details of all electrical, electronic and pneumatic circuit diagrams, details of each spare parts, catalogue No. etc. and details of each electronic card / PCB's; and
- Parts (IV)Schematic diagram for possible repair & maintenance.
- Parts (V) Standard Operating Procedure (SOP) for each analyzer.
- Parts (VI) List of equipments and other accessories along with contact details of supplier.

4.1.14. Digital Output:

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

4.1.15. Quality Control and Standard

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

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

i. Operating procedures for all analyzers and meteorological sensors

ii. Calibration procedures
iii. Calibration schedule
iv. Maintenance procedures
v. Maintenance schedule
vi. Data validation procedures
vii. Quality Assurance procedures
viii. Sample quality assurance documentation
ix. Sample Air Quality Report

The calibration procedures for analyzers shall conform to US EPA methodologies and shall include daily calibration checks, bi-weekly precision checks and linearity checks every six weeks. All analyzers shall undergo full calibration in every three months. Data obtained from these calibration checks and copies of associated Quality Assurance and calibration documentation, shall be submitted to the Buyer along with the Air Quality Data.

Air Quality Data shall be submitted to the Buyer on Real Time basis through automated system and on a monthly basis in the form of an Air Quality Report. This report shall includetabular and graphic information on gas and dust concentrations as well as meteorological data for each site. The data shall be reported in the form of 15-minute averages and shall also include daily, weekly and monthly averages, minimum, maximum, standard deviations, total data captured and percent data capture. It should also have stat validationmechanism and delayed data check mechanism. The Air Quality Report shall also include wind roses where wind speed and direction are measured.

4.2. SAMPLING SYSTEM

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

Gases sampling system:

4.2.1. Height of the sampling system :Approx. 1.0 meter above the roof
4.2.2. Roof entry cut out : Stainless Steel
4.2.3. Conduit : Stainless Steel
4.2.4. Inner sampling system : Borosilicate glass
4.2.5. Sampling head : Stainless Steel
4.2.6. Manifold : 10 port for tubes 6 x 1 mm, self-tightening
4.2.7. Sample air flow sensor : Uni-directional sample air flow measuringdevice should be installed at the sampling system to measure the flow of ambient air through sampling system. The output of signal should be connected to

computer to ascertain the continuous flow of sample from ambient air. The suction pump operational status should also be connected to the computer as a separate channel.

4.3. 19" RACK

Suitable19" Rack cabinet to accommodate all analyzers, calibrators, Zero air generators, data logger etc. The dimension of the rack without doors, with aluminum section and rear of 2 mm steel sheet, one removable roof plate, fitted with 4 filling eyebolts. Four roof fixing screws included in package to replace the lifting eyebolts. One gland plate threepart, one pair of 475mm (19") mounting angles depth adjustable in 25 mm pitch pattern fitted on two fixing angles approximately 150 mm unit from the front standard. To accommodate panel width of 19" size: Width = 600 mm, Height = 1400 mm and Depth = 800 mm. The 19" racks should be screwed to the floor of the station with anti-vibration pads. All nuts and bolts shall be cadmium coated.

5. CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYSERS for SO_2, NO-NO_2-NO_x, NH_3, CO, O_3, and BTEX

5.1. AMBIENT SULPUR DIOXIDE (SO2) ANALYSER

5.1.1	Principle	UV Fluorescence
5.1.2	Measurement	SO_2 in Ambient Air
5.1.3	Display	Digital
5.1.4	Ranges	Auto ranging 0-200 ppb
5.1.5	Lower Detectable Limit	1 ppb
5.1.6	Noise Level	0.5 ppb
5.1.7	Zero Drift	<1ppb/24Hrs.with automaticzero compensation
5.1.8	Span Drift	<1 ppb in 24 hrs.
5.1.9	Linearity	± 1% of full scale
5.1.10	Response Time	120 sec or less
5.1.11	Calibration	PleaseseeMulti-calibrationsection (S. No. 7) and also calibration section inGeneral Specifications(4.1.7 to 4.1.9)
5.1.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
5.1.13	Digital Output	Multiple drop RS 232, USB port /TCP/IP, Ethernet
5.1.14	Approval	USEPA/TUV approved Analyzer

5.2. AMBIENT OXIDES OF NITROGEN (NO-NO_2-NO_X) ANALYSER

5.2.1	Principle	Chemiluminescence
5.2.2	Measurement	NO-NO_2-NO_X in Ambient Air
5.2.3	Display	Digital
5.2.4	Ranges	Auto ranging 0-2000 ppb
5.2.5	Lower Detectable Limit	1 ppb
5.2.6	Noise Level	0.5 ppb
5.2.7	Zero Drift	< 1 ppb/24 Hrs.
5.2.8	Span Drift	< 2% in 15 days of full scale
5.2.9	Linearity	± 1% of full scale
5.2.10	Response Time	120 sec or less
5.2.11	Calibration	Pleasesee Multi-calibration section (S. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).
5.2.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
5.2.13	Digital Output	Multi drop RS 232 port, USB port /TCP/IP, Ethernet
5.1.14	Approval	USEPA/TUV approved Analyzer

5.3. AMBIENT AMMONIA ANALYSER (NH_3)

5.3.1	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)
5.3.2	Measurement	NH_3 in Ambient Air
5.3.3	Display	Digital
5.3.4	Ranges	Auto ranging 0-1000 ppb
5.3.5	Lower Detectable Limit	1 ppb
5.3.6	Noise Level	0.2% of reading
5.3.7	Zero Drift	<5 ppb /24 Hrs.
5.3.8	Span Drift	< 2% in 15 days of full scale
5.3.9	NH_3/NO converter	Quartz at approx. 1000 °C
5.3.10	Linearity	± 1% of full scale
5.3.11	Response time	<300 second
5.3.12	Rise / fall Time (95% of the final value)	< 30 Sec
5.3.13	Calibration	Pleasesee Multi-calibration section (S. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).
5.3.14	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA /4 – 20 mA a Digital output
5.3.15	Digital Output	Multi drop RS 232 port, USB port /TCP/IP, Ethernet
5.3.16	Approval	USEPA/TUV approved Analyzer

5.4. AMBIENT CARBON MONOXIDE (CO) ANALYSER

5.4.1	Principle	Non Dispersive Infra-Red (NDIR) with Gas Filter Correlation/ Cross Flow Modulation Method
5.4.2	Measurement	CO in Ambient Air
5.4.3	Display	Digital
5.4.4	Ranges	Auto ranging 0 - 100 ppm.
5.4.5	Lower Detectable Limit	0.1 ppm
5.4.6	Noise Level	0.05 ppm with time constant ± 30 seconds
5.4.7	Zero Drift	< 0.2 ppm/7 days
5.4.8	Span Drift	< 1% full scale in 24 hrs.
5.4.9	Linearity	Continuous ± 1%
5.4.10	Response Time	60 seconds or less
5.4.11	Calibration	Please see Multi-calibration section (S. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).
5.4.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
5.4.13	Digital Output	Multiple drop RS 232port, USB port /TCP/IP, Ethernet
5.4.14	Approval	USEPA/TUV approved Analyzer

5.5. AMBIENT OZONE (O_3) ANALYSER

5.5.1	Principle	UV Photometric / Chemiluminescence
5.5.2	Measurement	O_3 in Ambient Air
5.5.3	Display	Digital
5.5.4	Range	Auto ranging 0 - 500 ppb
5.5.5	Lower Detectable Limit	1.0 ppb
5.5.6	Noise level	±0.5 ppb
5.5.7	Zero Drift	< ½% per month
5.5.8	Span Drift	< 1% per month
5.5.9	Linearity	Continuous ± 1%
5.5.10	Response Time	30 seconds or less
5.5.11	Calibration	With built-in Zero and span generator and also seeMulti-calibration section (S. No. 7)
5.5.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
5.5.13	Digital Output	Multiple drop RS 232 port, USB port /TCP/IP, Ethernet
5.5.14	Approval	USEPA/TUV approved Analyzer

5.6. AMBIENT BTEX ANALYSER

5.6.1. GENERAL

A complete analyzer system comprising of sampling pump, transfer line, 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. Continuous unattended measurement system of individual BTEX should work without external cryogenic cooling. System should have protocol compatible to communicate & transfer data to DAS. Raw data storage capacity without erase minimum for three month or more. The system should be delivered with all necessary spares, consumables, tubing etc. for making it functional.

5.6.2. TECHNICAL SPECIFICATIONS

A single stage membrane Pump collect ambient sample automatically an inbuilt adsorption trap. Subsequent, the sample will be dissolved and injected on wide bore capillary gas chromatographic separation. Sample volume controlled by thermal mass flow controller (dust protected). Sample flow range may be 20 -100 ml/min or more (adjustable). Sample volume should be between 400 ml – one liter or more of ambient air over a 10-15 min sampling cycle. All sample transfer tubing should be in stainless steel and flow & pressure sensor to be preferred with digital display.

5.6.3. DETECTOR

Photo Ionization Detector **(PID)** or other equivalent detector as per EPA/EU/TUV/MCERT approved specifications, 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.

5.6.4. MINIMUM SPECIFICATIONS

5.6.4.1	Principle	Based on gas Chromatographic separation and Photo Ionization Detector (PID)
5.6.4.2	Measurement	Benzene, Toluene, Ethyl-benzene, m,p-Xylene and O-Xylene.
5.6.4.3	Display	Digital
5.6.4.4	Range	0 - 100 ppb (0.32 – 325µg/m^3)
5.6.4.5	Lower Detectable Limit	0.2 ppb (0.65µg/m3) for 15 min cycle for Benzene
5.6.4.6	Temperature Range	5 – 35°C or more
5.6.4.7	Repeatability	Retention Time:<0.1% RSD Concentration:<1.0% RSD
5.6.4.8	Typical Cycle Time	Total Cycle Time should not exceed 15min i.e. Sample Collection Time -15 min approx. Analytical Time- 15 min approx.
5.6.4.9	Sample Volume	1 liter for 15 min cycle.
5.6.4.10	Desorption tube	Carbotrap
5.6.4.11	Pre concentration	Carbopack
5.6.4.12	Calibration	The Analyzer should be capable to calibrate through Multi Calibration System also. Please see Multi-calibration section (S. No. 7) And also calibration section in General Specifications (4.1.7 & 4.1.9).
5.6.4.13	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
5.6.4.14	Digital Output	Multi drop RS 232 port, USB port /TCP/IP, Ethernet
5.4.4.15	Approval	USEPA/TUV/ MCERT approved BTEX Analyzer

6. CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYSERS (PARTICULATES)

6.1. CONTINUOUS PM_{10}MONITORING ANALYSER (β-RAY ATTENUATION)

Based on the principle of β-ray attenuation, 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 PM_{10}.

6.1.1	Principle	β-ray attenuation
6.1.2	Particle Size Cut Off	0 - 10 Microns
6.1.3	Measuring Range	0 – 1000 µg/m^3
6.1.4	Resolution	1% of the measurement range
6.1.5	Lower Detection Limit	< 4.8µg/m^3(1 hour)
6.1.6	Detector	Plastic Scintillator/GMCounter/Silicon-Semiconductor base
6.1.7	Air Flow Rate	16.7 Liters / minute
6.1.8	Filter Material	Glass Fiber Filter
6.1.9	Display	LED / LCD
6.1.10	Sampling Head	Dynamic heated sampling line with proper outer insulation for measurement of PM_{10}, with adjustable temperature 20-70 °C
6.1.11	Calibration	Reference membrane facility should be provided for calibration of analyzer
6.1.12	Compatibility	Analyzer should be compatible with protocols of DAS system to be used in station
6.1.13	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
6.1.14	Digital Output	Multi drop RS 232 port USB port /TCP/IP /Ethernet
6.1.15	Roll Length	Minimum 20 meters
6.1.16	Measurement cycle time	1 hour
6.1.17	Approval	USEPA/TUV approved Analyzer

6.2. CONTINUOUS $PM_{2.5}$MONITORING ANALYSER (β -RAY ATTENUATION)

Based on the principle of β-ray attenuation, 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 $PM_{2.5}$.

6.1.1	Principle	β-ray attenuation
6.1.2	Particle Size Cut Off	0 –2.5 Microns
6.1.3	Measuring Range	0 – 1000 µg/m^3
6.1.4	Resolution	1% of the measurement range
6.1.5	Lower Detection Limit	< 4.8µg/m^3(1 hour)
6.1.6	Detector	Plastic Scintillator/GMCounter/Silicon-Semiconductor base
6.1.7	Air Flow Rate	16.7 Liters / minute
6.1.8	Filter Material	Glass Fiber Filter

6.1.9	Display	LED / LCD
6.1.10	Sampling Head	Dynamic heated sampling line with proper outer insulation for measurement of $PM_{2.5}$, with adjustable temperature 20-70 °C
6.1.11	Calibration	Reference membrane facility should be provided for multipoint calibration of analyzer
6.1.12	Compatibility	Analyzer should be compatible with protocols of DAS system to be used in station
6.1.13	Roll Length	Minimum 20 meters
6.1.14	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA
6.1.15	Digital Output	Multi drop RS 232 port USB port /TCP/IP, Ethernet
6.1.16	Measurement cycle time	1 hour
6.1.17	Approval	USEPA/TUV approved Analyzer

Note: ***A distance of around 1.5 meter should be maintained between two sampling heads of $PM_{2.5}$ and PM_{10} samplers.***

7. MULTICALIBRATOR

Calibration system should provide for the calibration of the ambient air quality monitoring analysers (Gas).

7.1. MULTI POINT GAS CALIBRATION SYSTEM

1. The Gas Calibration System should be capable to do the following:
   (i) Multipoint calibration using automatic dilution system for the calibration of SO_2, NO, CO, NH_3 and BTEX analyser.
   (ii) Auto calibration (user selectable).
   (iii) Generate zero air of 99.9% purity (High Performance Zero Air Generator to be provided).
   (iv) Having facility for O_3Generator for stable and repeatability calibration.
   (v) Gas Phase Titration (GPT) with O_3 generator having 100% converter efficiency for conversion of NO to NO_2.
   (vi) Calibration using permeation tubes for which at least two chambers based Permeation system has to be provided.
   (vii) The Permeation System should be capable to accept permeation tubes up to 6cm in length and 2cm in diameter with user selectable temperature setting of 40°C and 50°C.
2. System should be 19” rack mountable.
3. System should be DAS compatible for remote calibration from Central Server.
4. The system should also have facility for multipoint calibration of Ozone analyzer.

7.2. METEOROLOGICAL, FLOW AND ELECTRONICS CALIBRATION

The supplier should provide calibration devices or calibration check devices for all the meteorological parameters namely temperature, wind speed, wind direction, relative humidity, solar radiation, rain fall as per the specifications of the manufacturers.

8. METEROLOGICAL SYSTEM

8.1. 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. The specifications are as follows:

(A) WIND SPEED

8.1.A.1	Range (Operation)	0-60m/sorbetter
8.1.A.2	Sustainability	Upto75m/sec
8.1.A.3	Accuracy	±0.5m/secorbetter
8.1.A.4	Resolution	0.1m/sec
8.1.A.5	Sensor Type	Ultrasonic
8.1.A.6	Threshold	0.5m/secorless
8.1.A.7	Response time	10secorbetter

(B) WIND DIRECTION

8.1.B.1	Range	0–359degree
8.1.B.2	Accuracy	±3degreeorbetter
8.1.B.3	Resolution	1degree
8.1.B.4	Sensortype	Ultrasonic
8.1.B.5	Threshold	0.5m/secorless
8.1.B.6	Responsetime	10secorbetter

(C) AMBIENT TEMPERATURE

8.1.C.1	Range	-10°Cto60°C
8.1.C.2	Accuracy	±0.2°Corbetter(withradiationshield)
8.1.C.3	Response	10secondsinstillair
8.1.C.4	Resolution	0.1°C
8.1.C.5	Sensortype	Resistancetype
8.1.C.6	Responsetime	10secorbetter

(D) RELATIVE HUMIDITY

8.1.D.1	Range	0 to 100% RH
8.1.D.2	Accuracy	± 3.0 % or better
8.1.D.3	Resolution	1%
8.1.D.4	Sensortype	Capacitive / Solid State
8.1.D.5	ResponseTime	10 sec or better

(E) SOLAR RADIATION

8.1.E.1	Range	0 to 1500 W/m^2 or better
8.1.E.2	Accuracy	± 5.0 % or better
8.1.E.3	Resolution	5W/m^2
8.1.E.4	Sensor type	Silicon Photo diode

(F) RAINFALL

8.1.F.1	Range	0.2 mm/hr to 100 mm/hr
8.1.F.2	Accuracy	± 5% or better
8.1.F.3	Resolution	0.2 mm
8.1.F.4	Sensor type	Tipping bucket rain gauge or any other suitable sensor
8.1.F.5	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:

8.1.G.1	Extended Height	10 meters
8.1.G.2	Retracted Height	2 metres
8.1.G.3	Wind load Limit	0.7896 sq. m. (8.5 sq. ft.) at 50 mph
8.1.G.4	Number of Sections	4
8.1.G.5	Construction material	Galvanised steel or aluminium

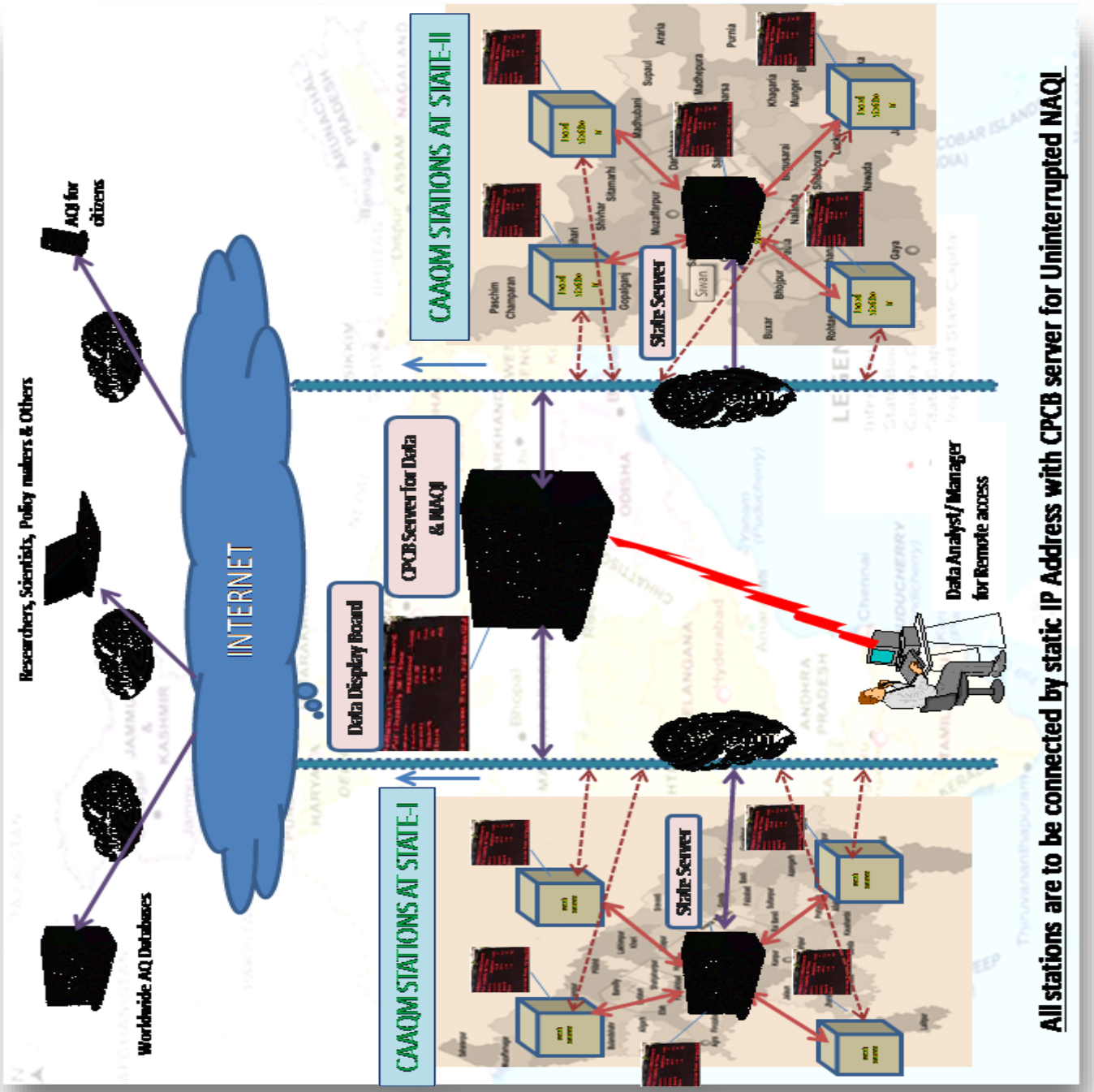
Note:

(i) Humidity and temperature sensors are to be supplied with weather and thermal radiation shield made of anodized aluminum and sensor should be supplied with all necessary cables, connector and mounting arrangements as required.

(ii) All the meteorological sensor should be certified/ traceable to World Meteorological Organization (WMO) and software should also have certification from the appropriate international agency.

9. DATA ACQUISITION AND COMMUNICATION SYSTEM

9.1. Typical Architecture for Data Connectivity



- This architecturedefines 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, parallely.
- Data display system at all locations display Pollutant, Meteorological and NAQI data on real time basis of all connected CAAQM Stations.

9.2. Data Acquisition and Handling System at Station

Type I: System comprises of data logger having DAS and station computer.
Or
Type 2: System comprises of station computer with DAS facilities.

Data logger/DAS with 8 analog, 24 digital inputs. Ability to log channels at different intervals and should have capability of averaging and displaying real time data and averaged data over a period of 1 min, 15 min, ½ hr, 1 hr, 4 hrs, 8 hrs, 24 hrs, 1 month and year. Communication between data logger and station computer should be using standard USB/RS232/RS485/Ethernet Connector. The data logger should have internal battery with charger and if it is PC based UPS serves the purpose.

The data logger/DAS should support LAN and Internal GSM modem/ Wifi for data transfer to central server. Station computer for data logging will be in addition to workstation computer required for calculating AQI, and will be of same or better specifications that of work station computer.

The supplier is supposed to install Computer System alongwith DAS of suitable high-end specification as per the design & specifications of DAHS. Real Time Data to be simultaneously transmitted from station computer to Central Servers at respective SPCB and CPCB.

Computer:
Brand new Computer of reputed make like HP, Dell, Lenovo, Compaq, IBM, Acer, Apple, Microsoft of configuration mentioned in the item “Work Station Computer for AQI” or better and compatible with DAHS to be supplied.

Presently network is envisaged for 250 such stations.

9.3. WORKSTATION COMPUTER for AQI

This has to be installed at CAAQM station for the preparation of AQI along with the station computer.
This PC would be controlled through remote mechanism with CPCB for the purpose of installation & maintenance of AQI Software. The supplier will maintain the Computer System (Hardware, OS, etc.). The specifications (can be better suiting to latest specifications and performance along with compatibility) are as follows:

9.3.1	**CPU**	Intel ® Core i7 8th generation or higher
9.3.2	**Memory**	8 GB DDR-IV, or better
9.3.3	**Ethernet ports**	Integrated intel ® Ethernet LAN 10/100/1000
9.3.4	**PCI Slots**	Two PCIex16 half height
9.3.5	**Optical Drive**	DVD R/W Internal
9.3.6	**HDD's**	3.5" 1TB, SATA drives
9.3.7	**Power Supply**	Standard suitable power supply
9.3.8	**Key board**	Optical Keyboard same as OEM
9.3.9	**Mouse**	Standard Optical Mouse same as OEM
9.3.10	**I/O ports**	Minimum 6 USB (at least 4 ports of 3.0)
9.3.11	**Monitor**	22" Wide or higher LED FHD Color Monitor
9.3.12	**Wireless adapter**	USB Wireless adapter x 1 no.
9.3.13	**OS support**	Open source Linux CentOS
9.3.14	**Warranty**	Warranty on site OEM warranty – comprehensive
9.3.15	**Type**	Desktop (Flat)/Tower

9.4. MANAGEABLE CISCO SWITCH (RACK MOUNTABLE)
Ethernet switch with LAN and WAN ports.

24 port managed fast/ gigabit EthernetCisco Switch with LAN and WAN ports (Atleast 04 PoE Ports) of latest series for installation at respective SPCBsORbetter

9.5. REMOTE MONITORING TOOL/ SOFTWARE

Remote calibration & validation management software and its licenses for the entire project duration for stations computer and central servers located at SPCBs and CPCB.

Data Acquisition Software (DAS) & its licenses to be provided for Central Servers at each SPCB and CPCB.

The remote connectivity tool/software like Teamviewer with License, procurement, installation & up-dation for the complete duration for each SPCB & CPCB, is to be done by the supplier.

9.6. 21U BLACK INDUSTRIAL RACK

This is to be installed at Central Server location (at respective SPCB's Head Office and CPCB-Delhi).

S. No.	Specifications	QTY / site
9.6.1	**19" Industrial Rack, 21U, Color Black consisting of:-**	**1**
9.6.2	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
9.6.3	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
9.6.4	Fan 230V, 90 CFM to be mounted on Rear Door.	4
9.6.5	AC Main Channel vertical two nos., 12x 5/15 Amps Sock RT-AQMP Make: Anchor with 32 Amps MCB make : Northwest or better	2
9.6.6	Horizontal Cable Manager	20
9.6.7	Vertical Cable Manager	10
9.6.8	Copper based Electrical Grounding / Earthing Strip. Provision for Fifteen (15) points.	1 Set
9.6.9	Each set of: a) Castor with Brake – 2 Nos. b) Adjustable screw legs –4 Nos. OR c) Base frame – 1 No.	1 Set
9.6.10	Light provision activation in the rack up on opening of the front/rear door.	1
9.6.11	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.

9.7. RACK SERVER

This is to be installed at Central Sever location (at respective SPCB's Head Office and CPCB-Delhi) along with the 21U Industrial Rack.

S. No.	Specifications	
9.7.1	CPU	Single CPU, Intel Xeon Quad Core E51620V3 3.50 GHz or higher, 10MB Cache per socket or higher. The Mother Board should support Dual Sockets. (Can be better suited to latest specifications, performance and compatibility)
9.7.2	Memory	32 (32 GB Support for each CPU) DDR-4, 1333/1600/1866/2133MHz, upgradable to 128 GB
9.7.3	Mother Board	Intel motherboard having compatibility to configuration desired

9.7.4	HDD	3*500GB SAS or better
9.7.5	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
9.7.6	PCI Slots	Provision for 2 *PCIexpress 2 *PCIe X2 or more slots to accommodate additional FC/Gigabit Cards Graphics Adaptors
9.7.7	Optical Drive	DVD R/W 16X Drive or better, External USB based
9.7.8	Form Factor	2U rack model with rail kit or better
9.7.9	Key board	Standard Optical wireless Keyboard
9.7.10	Mouse	Standard Optical Wireless Mouse
9.7.11	I/O ports	2 *USB ports, front & 2USB port Back,1 VGA Port, 1 external SAS, 1* Serial
9.7.12	Monitor	22” Wide LCD TFT Colour monitor
9.7.13	RAID Controller	RAID 5 minimum
9.7.14	Wireless adapter	USB Wireless adapter x 2 nos.
9.7.15	Antivirus	Standard Antivirus (McAfee / Norton / Trend Micro) for duration of 3 years
9.7.16	Redundant Power Supply & Fans	Redundant Power Supply 1+1, Redundant Fans
9.7.17	Warranty	Warranty is comprehensive 24x7 on site including spares for 3 / 3 / 3 years with 4 hours support
9.7.18	OS	Compatible OS should be provided.

9.8. WIRELESS ACCESS POINT (AP)

This is required along with server at respective central station (SPCBs and CPCB)

S. No.	Type of Access Point	Stand alone
9.8.1	Deployment	Indoor
9.8.2	Mounting	Ceiling/ Wall
9.8.3	Antenna Type	Internal
9.8.4	Number of Radios	Dual
9.8.5	Frequency Band	2.4GHz, 5.0GHz, 2.4GHz & 5.0GHz
9.8.6	Supported Wi-fi Standards	802.11 a/b/g/n/ac
9.8.7	Wireless Speed Up to (Mbps)	800
9.8.8	Max Wireless Signal Range in Mts	20
9.8.9	Channel Width (MHz)	80
9.8.10	Maximum Data Rate (MBps)	800
9.8.11	Supported Encryption	WEP, WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, EAP-TLS.,WEP,WPA-PSK,WPA-TKIP,802.11,EAP-TLS,WPA AES
9.8.12	Receiver Sensitivity in db	-99
9.8.13	Transmit power (tx)(dBm)	3
9.8.14	Radio Resource Management such for power channel, coverage hole detection and performance	Available
9.8.15	Support for Load Balancing between 2-	Available

	4 Ghz and 5 Ghz	
9.8.16	Support for Configurable Carrier Threshold	Available
9.8.17	Device Management	Web-based Configuration Interface (GUI)
9.8.18	Support for Mesh Networking	Available
9.8.19	Support for QoS for Voice over Wireless	Available
9.8.20	Support for MU-MIMO	Available
9.8.21	Number of MIMO supported & Spatial Streams	2 x 2 : 2
9.8.22	Number of WLAN (SSID) per AP	16
9.8.23	Maximum clients Nos	100
9.8.24	Support for Autonomous access-point option	Available
9.8.25	Number of 10/100/1000 port	1
9.8.26	mGig support	Available
9.8.27	Support for Beam forming	Available
9.8.28	Support for QoS and Video Call Admission Control capabilities	Available
9.8.29	Support for Rogue access point detection	Available
9.8.30	WPC certified	Yes
9.8.31	Wi-Fi CERTIFIED	Yes
9.8.32	Powering options (Such as AC/DC, 802/3af PoE, 802/3at PoE+), specify	802.3af PoE
9.8.33	Power POE (Watt)	11
9.8.34	Environmental Standard : plenum-rated (UL2043) for Indoor and IP67 for Outdoor	Yes
9.8.35	Operating Temperature Range (°C)	0-40
9.8.36	Operating Humidity (%RH)	95
9.8.37	Dimension (mm x mm x mm)	13.8 * 13.5 * 3.3
9.8.38	Weight (grams)	220
9.8.39	On Site OEM Warranty (Years)	5 Years

9.9. UTM (UNIFIED THREAT MANAGEMENT) DEVICE

This is required at respective SPCBs 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

9.10. PRINTER SPECIFICATIONS

COLOUR Laser Jet Multi-Function Printer (Print-Scan-Copy)

- Print speed black : 25 ppm
- Print Speed Colour : 5 ppm
- Scanner
- Resolution : 1200 x 1200 dpi
- Processor speed 1200 MHz Print or better
- Paper handling input, standard 250-sheet input tray or better
- 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

9.11. CONNECTIVITY FOR DATA TRANSFER

A) <u>LEASED LINE CIRCUIT</u>

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. 04 nos. of Real IPs to be obtained alongwith the Lease Line Circuit. Router equipped with 01 WAN Port and minimum 08 LAN Ports is to be procured alongwith the Leased Line Circuit.

B) <u>BROADBAND</u>

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

C) <u>GSM /Hotspot Connectivity</u>

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

10. DATA ACQUISITION SOFTWARE FOR STATION (CAAQM)

The software captures data from all channels in the system and stores in the station Computer.

(i) Data Acquisition

a) Frequency of data acquisition
   (i) User selectable 1,5,30,60,120 second averaging duration online digitally.
   (ii) Minimum frequency will be subject to capability of analyzer cycle.

b) Channel size
   (i) 32 Channels or more supported
   (ii) Expandable to 64 channels, if required in future

c) Data input
   Either Analog (0-1 volt/0-10 volt/2-20mA/4-20mA)or Digitalto configure with the PC. The condition is that system should remotely operatable.

d) User configurable channels, stations and equipment 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 $\mu g/m^3$ etc.

g) Software should be equipped to configure the analyzers with it, irrespective of company make and communication protocol of the analyzer and the output mode i.e. Analog or Digital (RS 232) of the instrument.

h) The output should be provided in user defined units.

(ii) Data Collection

a) Average data over user selectable time (1,5,30,60 seconds time interval) period.

b) Operational status, Error status, calibration status and calibration values observed from the analyzer should be captured and should be made available along with the data with a frequency of maximum five minutes.

c) System should collect of the diagnostics of the instrument comprising actual diagnostics parameters and their values at least once in every five minutes to check the state of the health analyzer.

d) Calibration parameters
   (i) Provision to entering zero calibration, span calibration values of gas cylinder/permeation to devices
   (ii) Provision for collecting zero calibration, span calibration values(pre calibration & post calibration) in to the database for further analysis.
   (iii) Provisions to collect electronic system pre calibration & post calibration values from the analyzer to ascertain the percentage deviation/ correction applied during each calibration and record it in database at station & Central computer.

(iii) 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) Current data should be stored as per ISO-7168-1:1999I format and should be available in folder named as c:\Data\ at an interval of 15 minutes. As an example c:\data\01.05.2015.xml. the file will be appending without double data entry and as per ISO format.
e) Data should also be stored for last two years in E:\data\Year\Month\day i.e. e:\data\2015\05\01.05.2015.xml ….
f) If data encryptionis done, then 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 AQI software, procedure should be available without any licensing. AQI calculating Software will be provided by CPCB/SPCB.

(iv) Data Display (Statistical analysis of data)

a) Main window for real time display of all measured parameters with status of all analyzers/sensors.
b) In 4-in-4 graphs and4-in-1 graph formats
c) In tables of 4-in-1 format
d) Real time multi-graphs over user selectable time period i.e. 6.00 AM to 6.00 AM etc.
e) Display of graphic & tabular display of the current data.
f) Graphical form should comprise of 4-4 graphs, 4-1 graphs in user defined format (1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly; user definable time series)
g) Tabular form should comprise of 4 channel list in user defined format (1, 5, 10, 15, 30 min, 1hour, 4, 8, 24 hour, 30 days and yearly; user definable time series)
h) Station instruments basic configuration etc. should be visible on screen continuously.
i) Statistical analysis tools like regression analysis, co-relation analysis and other analysis as per industry standards in the field of environment should be available and if not the firm should develop these for CPCB within a time frame of six months.
j) The system should have procedures for normal analysis tools like calculation of data with respect to a threshold value, average, minimum, maximum, calculation of violating value with respect defined values(National Air Quality Standards) for defined period for the database etc.
k) Data analysis of diagnostics parameters

l) Data analysis of Pre calibration and post calibration data (if facility not available, should be developed within six months)
m) Data analysis of corrections applied of each calibration cycle (if facility not available should be developed within six months)

(v) Data Backup

a) There should be defined data backup procedure through which data can be extracted from station computer in simple text format/excel/ ISO format(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.

(vi) 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.
c) There should be provision of two databases one is raw database and another corrected database.
d) Validation of data through calibration database Pre calibration & post calibration values collected.

(vii) 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 and data should be excluded from the database
d) Calibration database need to be formed, stored and transmitted to central server.
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.

(viii)Location of station

a) Fixed and Mobile Stations location to be recorded and North correction feature should be available.
b) Latitude and longitude of stations be recorded

(ix) Data transfer to Central

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

a) User selectable time frame for transmission of data to central server.
b) Diagnostics (actual diagnostics parameter values recorded each time in the station), configurations(station channel configurations), alarms(generated alarms) should be transmitted.

(x) Data transfer to Display Boards at Public Site

Software should have provisions to connect data output including current pollutants concentration, AQI, advertisement, etc. to thedisplay boards (LEDs), to be installed at public site. For the purpose Data display device has been recommended in the document.

11. DATA ACQUISITION SOFTWARE AT THE CENTRAL STATION AT EACH SPCB & CPCB

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

A (i) 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 from all locations maximally within 5minutes duration or at user defined time intervals.
d) Data along-with diagnostics and calibration details should be transmitted at central from all connected locations.
e) Should support dialup systems, broadband connectivity, wireless connectivity, 2G or 3G or any new technology which shall be in place during project time should be compatible and if not, need to developed by the system provider up- to project duration without additional charges.
f) Should have the remotecontrol facilities for calibrations (Zero & Span) of instruments and measuring range modifications.
g) Should have facility for displaying data communication error reports, image management which should be recorded and should be available for display.

(ii) Data Display at Central Station

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 i.e. 6.00 AM to 6.00 AM etc.
d) Display of graphic & tabular display of the current data like simple 3D line and column chart, 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, 30 min, 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 (minimum 12 directional) with user defined time limits.
i) Calculate vector mean of wind direction.
j) Programmable downloading of data.

k) Comparison of data w.r.t. Standards in Graphical form and tabular form with information of 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 ID, date & time, on monthly basis.
o) Data validation trail recording.

(iii) Data Export

a) Data export in ISO7168 format is required to be done automatically.
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.

(iv) Data Import

a) In case of communication medium fails there should a mechanism to shift the data into Pen drive (Physical medium for data collection) physically and a procedure to import the same on central software.

(v) 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.

(vi) Delayed data checks & Validation of data at Central Software at SPCB

a) After instruments perform the calibration the results obtained should be recorded and should be transmitted to central computer and stored.
b) 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 to the user for 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.
c) Software utility should be provided through which validation of data could be done at SPCB and the validated data files be synced with database at CPCB.
d) The utility should provide date wise access to the data available in the station computer in the editable form alongwith provision to record events/remarks and should store in the database in the station computer as “Validated Data”. However, the raw data should remain intact.

e) Validated files should also be stored in the stations computer in a folder at C:\Data\stationName\Datevalid.txt (Ex: C:\Data\NehruNagar\21062019valid.txt). This file format should be same as csv file format as mentioned at Annexure-I.

(vii) Data Display at CAAQM Locations and SPCB Offices

(a) AtCAAQMStation:
A display board will have to be supplied & installed by the supplier at each CAAQM Station or nearby to it (may be few kilo meters) for which space to be provided by CPCB/SPCB/PCC etc.

(b) At SPCB Offices:
A display board will have to be supplied & installed by the supplier at each SPCB Office for which space to be provided by CPCB/SPCB/PCC etc.

(c) CPCB/SPCBintendstoshowthecontent:
(i) InformationfromExternalSources
(ii) InformationdrawnfromInternaldatabases
(iii)AdvertisementintheformofText,Slides,Charts,Videos etc.
(iv)Live Feeds

(d) ContentManagementSystem

Content Management for Data Display Boards is to be managed both locally &Centrally. Hence, the supplier is requested to provide software for local (at CAAQMS) & Central content management (at CPCB & SPCB). The central software should be capable to operate simultaneously at SPCB and CPCB. There could be two different softwares at SPCB & CPCB to manage contents of display boards of CAAQM Station & SPCB Office.

Therefore, Display Board Data Transmission Device (DBDTD) should be capable to collect the content from local station, SPCB Central Software and CPCB Central Software manually through scheduling procedure for different durations (Minutes, Hours, Days, Weeks, Months, Years etc.), zone-wise, state-wise, group-wise, device-wise, content-wise separately as there will be of different contents to be displayed at different locations.

The central software should have the capability of Remote machine status monitoring & management. It should be capable to provide on-screen display of remote display board (live screen of display board).

Establishing the required connectivity by using necessary devices (either through LAN, Wi-Fi, GSM etc.) between the DBDTD and CPCB & SPCB to run the content seamlessly is within the scope of the supplier.

(viii) Remote Procedures (if not available facility should be developed by the firm)

a) Central software should have capability to allow to connect any station computer through remote.
b) Central software administrator should be able to go for remote calibration of any of the systems.
c) Software should be capable to operate remote stations configurations.
d) Control panel window should be available for controlling each analyzer that means each analyser should be controllable separately through remote software being provided with the software system.
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 at SPCB location should be active.

(ix) Data Reports Generation

a) To prepare reports hourly, weekly, monthly, yearly in user defined interval and formats.
b) Mean, Median, Percentile, Maximum, Standard deviation, Frequency analysis and Maximum Frequency analysis.
c) <u>Data Comparison</u>
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.
d) <u>Data Comparison on different time scale</u>
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.
e) Data reports, calibration reports and status reports with user time periods.
f) Historic multi-curves / graphs over user selectable time period.
g) 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.).
h) Diurnal variation, standard deviation, regression and other statistical parameter reporting possibilities with various available mathematical methods.
i) If required separate report generation procedures have to be developed for which firm will be responsible for project duration.

j) Daily report from each station should be generated and sent through email for hourly data of each parameter (including meteorological parameters, diagnostics of instruments and calibration of instruments if performed during that day) automatically format for which can be mutually agreed upon.
k) Data should be downloadable in Excel Sheet, CSV format through user selection.
l) Provision should be there to use raw as well as validated data for generation of all types of graphics including windroses and pollution roses.

B. SECURITY

a. Software should be totally secured with protection against virus, malware etc.
b. Security device like firewall for VPN Tunneling should be installed.

C. OTHER TECHNICAL CONDITIONS

1. Compatible Hardware required for data transmission through Data Display Connection Device has to be installed.
2. Should support the latest formats of Windows 32 bit or 64 bit. Any new patches developed or upgraded software during project duration should be provided without additional cost.
3. Manual of complete system should be provided.
4. Firm should provide the hardware required for data acquisition along with all the software's required like OS, Networking software, Remote functionality software and should maintain hardware and software for project duration.
5. All softwares like OS, Data Acquisition Software, Remote Calibration Software, Content Management Software etc. used for the entire project, should be either open source or with license. Copy of licenses should be provided to SPCB/CPCB.

12. DISPLAY BOARD DATA TRANSMISSION DEVICE

S. No.	Item Description	Specifications
12.1	PROCESSOR	Intel® Corei5 equivalent Or Better
12.2	Memory	6 GB, Memory slots for Micro SD or fullsize SD card slot with Memory support for at-least 8 GB
12.3	Ports	a. One HDMI b. LAN Port for Ethernet Network Connection c. Minimum of 3 USB Port with support for USB2.0 or USB 3.0.
12.4	OS Support	Linux, or Windows OS
12.5	Communication Options	a. LAN Communication b. Wifi Communication – Wifi Hotspot enabled/ GPRS Comm. Enabled
12.6	Power Supply	5 to 12 V DC through 220V 50Hz AC Supply adapter or USB driven.
12.7	Size	Mechanical Chassis Size not to exceed 10” x 6”x 6” with stand alone tower/box.
12.8	Operating Environment	Operating Temperature 0°C to + 50°C Humidity upto 90%
12.9	Device Support	05 Years
12.10	Antivirus	It should be secured. If Windows, then licensed anti-virus should be there during the project duration.
12.11	General	Supplier will configure and deploy the communication mechanism. Complete manual of the device should be provided.
12.12	Accessories	01 Meter HDMI Cable
12.13	Internet	To be provided by the vendor either through GSM SIM or through Wifi Enabled Dongles.
12.14	Display Board should show	Last data saved.
12.15	Display Board should show	Last updated time should be displayed
12.16	Software	The vendor is responsible to provide software which can download the data from Station computer, AQI, Advertisements etc. store it and display on the Display Board seamlessly.

13. DAY LIGHT & NIGHT VISIBLE TRUE COLOR DATA DISPLAY SYSTEM

(A) LOCATION NEAR TO CAAQM STATION

S. No.	Item Description	Specifications
13.A.1	Size and Display System (H x W) feet and Pixel	4 x 8 feet, P6, 6mm (+/- 05mm) pixel pitch
13.A.2	Visibility Range	~10 Meters (Day time)
13.A.3	Brightness	7000 NIT or higher
13.A.4	Display of Colour Elements	SMD 3535 or better
13.A.5	Minimum Life span of the system	LED Life 100000 Hours
13.A.6	Viewing angle	Viewing angle of 140°Horizontal/140°Vertical
13.A.7	Operating and Non-operating Temperature	-15°C to 55°C
13.A.8	No of Color	281 trillion Colors, 256 brightness level dimming capability
13.A.9	Data processing	16-bit data processing, 100 % Digital
13.A.10	Scan rate and refresh frequency	Scan Ratio 1:1 and with minimum 1920 Hz refresh frequency
13.A.11	LED internal and External Cabinet type	Internal LED frame should be made of Aluminium and External cabinet should be factory made without pin holes, LED Display should be serviceable from front and back.
13.A.12	Color Temperature - Adjustable	4500 - 9000 K range
13.A.13	Input Power Requirement/ Consumption	220 V, 50/60Hz, Power consumption 200 W (maximum)/m2
13.A.14	Display Board Mounting	Structure based upon location. Uni-Pole (05 meters) arrangement or Handing is in the scope of supplier.
13.A.15	General	The system should also have the facility to display the environmental picture through video camera/vcr/cd player etc. for public awareness.
13.A.16	Power Cable Laying	Depending upon location, cabling is to be done by the firm.
13.A.17	Device at Display Board to pick up data from stations and transmit it to LED Display	Display data connectivity device/system with GSM SIM has to be installed nearby LED board which will pick up data from station computer through Internet. LED to be placed away from through Internet. LED to be placed away fromthe station premises.
13.A.18	Certification	BIS
13.A.19	IP Rating	Display Module IP67, Cabinet IP65

(B) LOCATION AT STATE POLLUTION CONTROL BOARD (SPCB)

S. No.	Item Description	Specifications
13.A.1	Size and Display System (H x W) feet and Pixel	4 x 8 feet, P6, 6mm (+/- 05 mm) pixel pitch
13.A.2	Visibility Range	~10 Meters (Day time)
13.A.3	Brightness	7000 NIT or higher
13.A.4	Display of Colour Elements	SMD 3535 or better
13.A.5	Minimum Life span of the system	LED Life 100000 Hours
13.A.6	Viewing angle	Viewing angle of 140° Horizontal/140° Vertical
13.A.7	Operating and Non-operating Temperature	-15°C to 55°C
13.A.8	No of Color	281 trillion Colors, 256 brightness level dimming capability
13.A.9	Data processing	16-bit data processing, 100 % Digital
13.A.10	Scan rate and refresh frequency	Scan Ratio 1:1 and with minimum 1920 Hz refresh frequency
13.A.11	LED internal and External Cabinet type	Internal LED frame should be made of Aluminium and External cabinet should be factory made without pin holes, LED Display should be serviceable from front and back.
13.A.12	Color Temperature - Adjustable	4500 - 9000 K range
13.A.13	Input Power Requirement/ Consumption	220 V, 50/60 Hz, Power consumption 200 W (maximum)/m2
13.A.14	Display Board Mounting	Structure based upon location. Uni-Pole (05 meters) arrangement or Handing is in the scope of supplier.
13.A.15	General	The system should also have the facility to display the environmental picture through video camera/vcr/cd player etc. for public awareness.
13.A.16	Power Cable Laying	Depending upon location, cabling is to be done by the firm.
13.A.17	Device at Display Board to pick up data from stations and transmit it to LED Display	Display data connectivity device/system with GSM SIM has to be installed nearby LED board which will pick up data from station computer through Internet. LED to be placed away from through Internet. LED to be placed away from the station premises.
13.A.18	Certification	BIS
13.A.19	IP Rating	Display Module IP67, Cabinet IP65

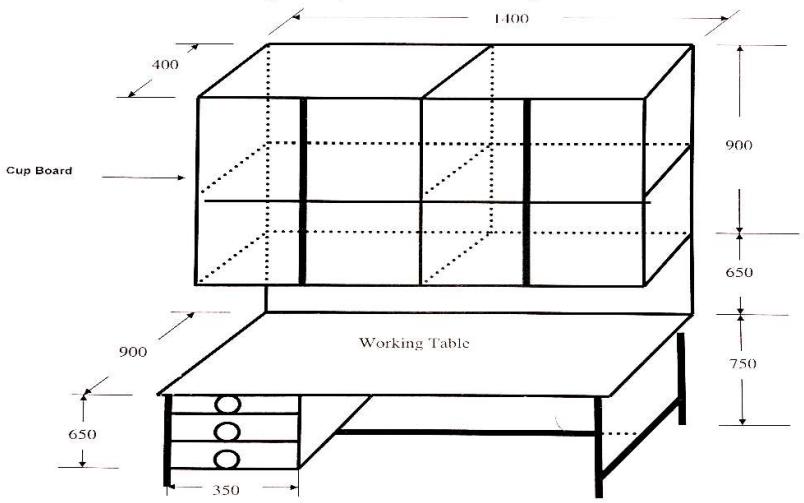
14. ANNEXURE

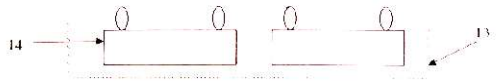
(A) Drawing of a CAAQM Station

- ”Roof Mounted Split AC” may be considered as “Roof/Wall Mounted Split AC”, if applicable in the diagram below.

ANNEXURE - I

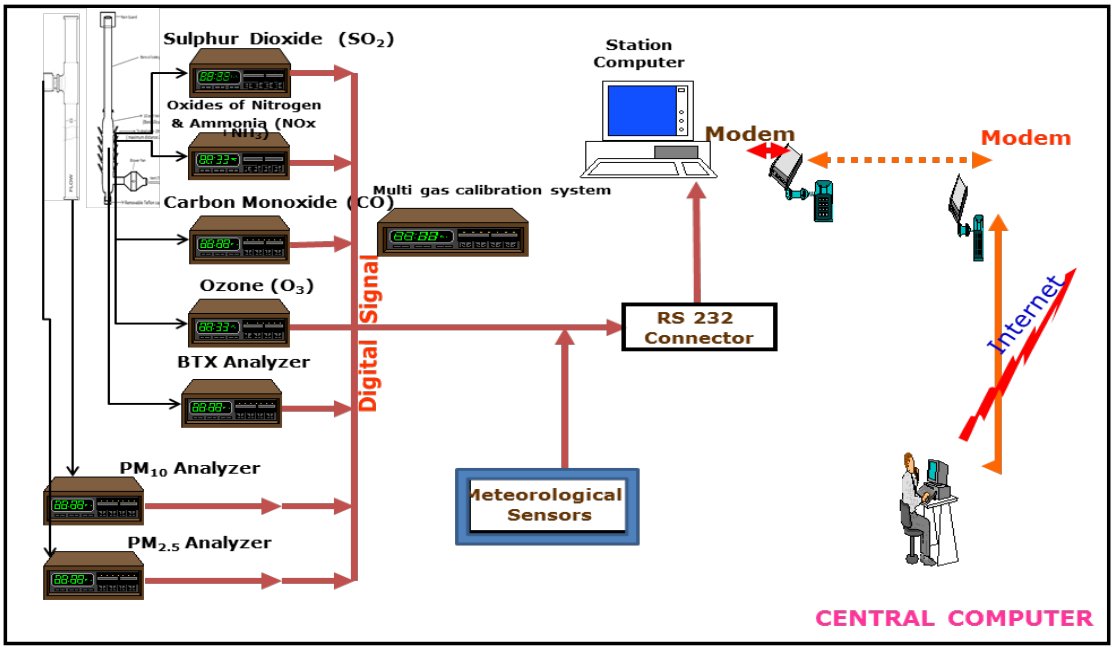
Drawing of Cup Board and Working Table





ANNEXURE - I

(B) Architecture of CAAQM Station



(C) Protocol for Data Transmission from CAAQM Stations

Presently CPCB is operating NAQI network which uses this protocol mentioned below for the data collection at central server to generate NAQI which is made available to the public. The Instrument Supplier will have to generate the data output immediately after installing the CAAQMS at any location in this format so that station gets integrated into the existing system immediately.

However, the proposed procedure given in this document of data management through ISO-7168 format would be applied after proper system checks and setup. In parallel both systems will be operated for nearly six months and finally, ISO based system will be adopted for future data management from CAAQMS in the entire country.

1. Data Format

- Data file on real time basis having 15 minutes average values in a prescribed format attached at Annexure-I should be generated at the station for which Instrument Supplier is responsible.
- File should be updated after every 15 minutes.
- Data intervals like 00:15, 00:30, 00:45, 01:00 should be fixed at the station.
- Station file name should be exactly as the name of the station to be displayed on the web portal. i.e. Sanathnagar, NehruNagar. Here precaution is to be taken that no space between words should be given or no special characters should be used.

- File should be recorded in a folder c: \data \sanathnagardata.txt
- File should allow data appending sequentially.
- Date of last file record appended in the file should be recorded and data afterwards be placed in the data file.
- File appending should continue subject to max 97 lines. First in First out mechanism shall be followed in keeping file size to 97 lines.
- Hence, in the specified folder c:\Data\ there will be a single file which will keep appending as per format attached.
- Duplicate entry of any data should not be made in the file.
- System should have capability to create previous record data file for which user will give the date. This is required to have lost data makeup in the final database, if any.

2. Data Mapping

- Protocol for each parameter is fixed as below :
  1. 15 minutes average value will be provided by the operator of the CAAQMS
  2. Each SPCB will have the parameter as mentioned in the table only. Not even a small gap or space is provided other than the mentioned table above.

3. Standard Parameter Naming Protocol and Conversion factors Table

S. No.	Parameters Name	Parameter Abbreviations	Unit	Conversion factors at 25°C
14.C.3.1	Rack Temperature	Temp	°C	--
14.C.3.2	Carbon Monoxide	CO	mg/m^3	1ppm=1.145mg/m^3
14.C.3.3	Sulphur Dioxide	SO_2	$\mu g/m^3$	1ppb=2.62 $\mu g/m^3$
14.C.3.4	Nitric Oxide	NO	$\mu g/m^3$	1ppb=1.23 $\mu g/m^3$
14.C.3.5	Nitrogen dioxide	NO_2	$\mu g/m^3$	1ppb=1.88 $\mu g/m^3$
14.C.3.6	Oxides of Nitrogen	NO_X	ppb	--
14.C.3.7	Ozone	O_3	$\mu g/m^3$	1ppb=1.96 $\mu g/m^3$
14.C.3.8	Particulate Matter less than 10 micron size	PM_{10}	$\mu g/m^3$	--
14.C.3.9	Wind Speed	WS	m/s	--
14.C.3.10	Wind Direction	WD	Deg	--
14.C.3.11	Ambient Temperature	AT	°C	--
14.C.3.12	Relative Humidity	RH	%	--
14.C.3.13	Barometric Pressure	BP	mm Hg	--
14.C.3.14	Solar Radiation	SR	W/m^2	--
14.C.3.15	Rain Fall	RF	mm	--
14.C.3.16	Vertical Wind Speed	VWS	Degree	--
14.C.3.17	Particulate Matter less than 2.5 micron size	$PM_{2.5}$	$\mu g/m^3$	--
14.C.3.18	Benzene	Benzene	$\mu g/m^3$	1ppb=3.19 $\mu g/m^3$
14.C.3.19	Toluene	Toluene	$\mu g/m^3$	1ppb=3.77 $\mu g/m^3$

S. No.	Parameters Name	Parameter Abbreviations	Unit	Conversion factors at 25°C
14.C.3.20	Xylene	Xylene	$\mu g/m^3$	1ppb=4.34 $\mu g/m^3$
14.C.3.21	Ethyl Benzene	Eth-Benzene		1ppb=4.34 $\mu g/m^3$
14.C.3.22	M+P_Xylene	MP-Xylene		1ppb=4.34 $\mu g/m^3$
14.C.3.23	Methane	CH_4	$\mu g/m^3$	1ppb=0.65 $\mu g/m^3$
14.C.3.24	Ammonia	NH_3	$\mu g/m^3$	1ppb=0.70 $\mu g/m^3$
14.C.3.25	Formaldehyde	HCHO	$\mu g/m^3$	1ppb=1.23 $\mu g/m^3$
14.C.3.26	Mercury	Hg	$\mu g/m^3$	1ppb=8.20 $\mu g/m^3$

Note: 1. Any other parameter can be added with the prior approval of IT Division ONLY.

4. Internet Connectivity

Internet connectivity should be available on 24 x 7 basis for data transmission with an uptime of 99.9%. For this purpose, every CAAQM station should have two kinds of connection:

(i) Lease Line Circuit of at least 01 Mbps capacity
(ii) Broad Band connectivity through telephone line. Both facilities should be configured in ready to use condition. If possible auto failover should be created.

Note : Connectivity through Data card is not acceptable except in any special circumstances, where both of these types of connectivity's are not available. For such case CPCB IT Division shall be consulted before taking a final decision.

5. Other Information

1. Area Map showing station location
2. Latitude, Longitude and altitude of the station
3. Photo of station along with nearby areas
4. One page write-up about the station activities in the vicinity of station including major pollution sources like nearby road, rail, restaurants, generator sets, etc.

Annexure — I

FileName:sanathnagar

1,2,3,4,5,6,7,8,
Station name, Parameter, Date from, Date to, Value, calibrationflag, maint flag, Remark,
Sanathnagar,CO,27-04-201513:00,27-04-201513:15,0.2497,0,0,analyserfaulty,
Sanathnagar,CO,27-04-201513:15,27-04-201513:30,0.2470,0,0,analyserfaulty,
Sanathnagar,CO,27-04-201513:30,27-04-201513:45,0.2470,0,0,analyserfaulty,
Sanathnagar,CO,27-04-201513:45,27-04-201514:00,0.2470,0,0,analyserfaulty,
Sanathnagar,Ozone,27-04-201513:00,27-04-201513:15,59.6710,0,0,flowproblem,
Sanathnagar,Ozone,27-04-201513:15,27-04-201513:30,59.5960,0,0,analyserfaulty,
Sanathnagar,Ozone,27-04-201513:30,27-04-201513:45,59.5960,0,0,analyserfaulty,
Sanathnagar,Ozone,27-04-201513:45,27-04-201514:00,59.5960,0,0,analyserfaulty,
Sanathnagar,NO,27-04-201513:00,27-04-201513:15,0.5922,0,0,analyserfaulty,
Sanathnagar,NO,27-04-201513:15,27-04-201513:30,0.4435,0,0,0,
Sanathnagar,NO,27-04-201513:30,27-04-201513:45,0.4435,0,0,0,
Sanathnagar,NO,27-04-201513:45,27-04-201514:00,0.4435,0,0,0,
Sanathnagar,SO2,27-04-201513:00,27-04-201513:15,3.5233,0,0,0,
Sanathnagar,SO2,27-04-201513:15,27-04-201513:30,3.7278,0,0,0,
Sanathnagar,SO2,27-04-201513:30,27-04-201513:45,3.5233,0,0,0,
Sanathnagar,SO2,27-04-201513:45,27-04-201514:00,3.7278,0,0,0,
Sanathnagar,RT,27-04-201513:15,27-04-201513:30,33.2260,0,0,0,
Sanathnagar,RT,27-04-201513:30,27-04-201513:45,33.2240,0,0,0,
Sanathnagar,AT,27-04-201513:45,27-04-201514:00,33.0960,0,0,0,
Sanathnagar,AT,27-04-201514:15,27-04-201514:30,33.3740,0,0,0,
Sanathnagar,RH,27-04-201513:15,27-04-201513:30,41.3080,0,0,0,
Sanathnagar,PM10,27-04-201513:15,27-04-201513:30,30.3000,0,1,analyserfaulty,
Sanathnagar,PM10,27-04-201513:30,27-04-201513:45,30.3000,1,0,analyserfaulty,

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Pleasenote:

Here 0-zero stand for normal operation of instruments in **calibration flag status**
1-Stands for calibration mode ON and data will not be considered for averaging purpose.
Same is true for Maintenance mode where 0-normal and 1 maintenance mode ON

References:

1. Technical Handbook for Installation, Maintenance,Calibration, Data ConnectivityandDataQualityCheckofContinuousAmbientAirQuality Monitoring System(Real Time)
2. GuidelinesfortheMeasurementofAmbientAirPollutants,Volume-II
3. NationalAmbientAirQualityStandards(2009)

SECTION VIII

CHECKLIST

CHECKLIST-1

Note1 for Bidders:(Bidder shall indicate "Attached at <Page No.> of <Submitted Document No.>" or "Not Attached: <Reasons>", as applicable against each row

Pre-Qualification Requirements (PQR) Checklist

S. NO.	HEAD / DESCRIPTION	BIDDER'S RESPONSE
1	The bidder should be a manufacturer or authorized dealer of items (i.e. Analyzers, Monitors, Calibrators and Sensors), who must have manufactured, supplied, tested and commissioned **minimum five (05) nos.** similar air monitoring stations with minimum five (subject to the condition that all eight parameters should have been incorporated in the eligible projects undertaken by Bidder) tendered parameters [NO-NO_2-NO_X, SO_2, NH_3, CO, Ozone, PM_{10}, $PM_{2.5}$, BTEX] either container-based or otherwise in **last seven (07) years** (reckoned as on date of techno-commercial bid opening) **with CPCB/ State Pollution Control Board/ Semi-Govt. or any State or Central government organizations or Public Sector Undertakings (PSUs)** which should be in continuous operation as on date of techno-commercial bid opening. (**Performance Statements**along with **Attachments 6B, 6C, 6D of Section-III**)	
2	Bids of bidders **quoting as authorized representative of a manufacturer** can also be considered, provided (i)the manufacturer furnishes a legally enforceable authorization certificate in the prescribed form at Attachment2C of Section-III, assuming full guarantee and O&M obligations as per GCC and SCC, for the goods offered; and (ii)the bidder, as authorized representative, supplied, tested, and commissioned minimum 05 nos. of similar air monitoring stations, either container-based or otherwise with CPCB/ State Pollution Control Board/ Semi-Govt. or any State or Central government organizations or Public Sector Undertakings (PSUs) in any one year of the last seven (07) years which should be in continuous operation during last seven (07) years as on date of techno-commercial bid opening. (**Performance Statements**along with **Attachments 6Cof Section-III**)	
3	List of Manufacturers **(Attachment-6 of Section-III)**	
4	For the item(s) not manufactured by the Bidder (i.e. Analyzers, Monitors, Calibrators and Sensors), the **bidder should be authorized by the manufacturer(s)** for these items as per the format **"Form of letter of authorities"** provided as **Attachment 2C of Section III**.	
5	Certificate from Manufacturer stating the **country of origin** of each equipment duly authenticated by competent authority of that country **(as per Attachment-3 of Section-III)**	
6	Copy of Certificate of **Supply of Spares and Consumables** by Manufacturer**(Attachment-4 of Section-III)**	

S. NO.	HEAD / DESCRIPTION	BIDDER'S RESPONSE
7	Copy of Certificate of local branch, sales, residential and representative office(s) of the Bidder in India (Format similar to **Attachment 1 of Section-III**)	
8	Certificate of O&M Partner of the Bidder in India **(Attachment1 of Section-III)**	
9	Form of Letter of Authority by O&M Associate **(Attachment2 of Section-III)**	
10	Performance Statement for Bidder as O&M Operator of the CAAAQMS **(Attachment 6D of Section-III)**	
11	Capability and Experience of O&M Partner along with Curriculum Vitae of persons with required experience **(Attachment 7 of Section-III)**	
12	Form of Bank Guarantee **(Attachment 8 of Section-III)**along with scanned copy of submitted Bid Security/**EMD of Rs. 50 lakhs. If seeking relaxation, furnish** certified copy of their **registration with MSME**. **Note:** EMD has to be submitted in accordance with clauses as mentioned in Section-I of the bidding document.	
13	The bidder must have average annual turnover of minimum Rupees **12 Crore (INR Twelve Crores)** over **last three (03) years**. The annual turnover is to be supported by the **annual report**. Detail of annual turnover shall be furnished as per **Attachment 6A Section-III** along with **Audited Balance Sheets of last 03 years** i.e. 2022-23, 2023-24, 2024-25	
14	Form of Pre-requisites for installation of equipment **(Attachment 9 of Section-III)**	
15	The bidder shall have ISO 9001:2015 certification valid as on last date of submission of bid.**(Copy to be enclosed)**	
16	The bidder should not have been debarred by any Government (State / Central) / Semi Government / Corporation / PSU/ tendering department in India in **last three (03) years** for unsatisfactory past performance, corrupt, fraudulent or any other unethical business practices as specified in Rule 151 of GFR, as on date of NIT. Such abandonment or punishment will be considered as disqualification towards eligibility, A **declaration in the form of affidavit** has to be furnished by prospective bidders along with bid submission.	

Note 2 for Bidders: The document sets submitted as pdf should contain a Table of Contents/Index with detail of Documents in that pdf with corresponding page numbers.

CHECKLIST-2

Notefor Bidders:

1. (Under the head "BIDDER's RESPONSE", the Bidder shall indicate "Complied with <Page No.> of <Submitted Document No.>" or "Non Complied with <Details>" as applicable in each row.
2. The document sets submitted as pdf should contain a Table of Contents/Index with detail of Documents in that pdf with corresponding page numbers. In case of any discrepancy in this Checklist, the specifications mentioned in Section-VII shall be taken into consideration.

Technical Data Sheet Checklist

Code No.: 1			
Equipment Name: Monitoring Station (Container-based) with required foundations			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
1.1	GENERAL	Monitoring Station 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. Three Nos. 19" racks shall be installed inside the station so that the analyzers are easily accessible from front & back for calibration and maintenance.	
1.1.1	Dimensions	Details as mentioned in Section VII of the bid document.	
1.1.2	Frame	Details as mentioned in Section VII of the bid document.	
1.1.3	Panelling	Details as mentioned in Section VII of the bid document.	
1.1.4	Floor	Details as mentioned in Section VII of the bid document.	
1.1.5	Outer Door	Details as mentioned in Section VII of the bid document.	
1.1.6	Electric Power Supply Box	Details as mentioned in Section VII of the bid document.	
1.1.7	Partitioning for Calibration Gas Cylinders, Meteorological Mast and UPS	Details as mentioned in Section VII of the bid document.	
1.1.8	Station Furnishing	Details as mentioned in Section VII of the bid document.	
1.1.9	Container Foundation (RCC)	Details as mentioned in Section VII of the bid document.	
1.1.10	Security Cabin	Details as mentioned in Section VII of the bid document.	

Code No.: 2.1			
Equipment Name: Air Conditioner, Split Type, Wall/Roof Mounted			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
2.1	**SPLIT AIR CONDITIONER (2.0 TON CAPACITY)**		
2.1.1	Type & Capacity	Split type, 2-ton cooling only capacity Inverter AC, Wall/Roof mounted of 5-star rating with an automatic timer. Separate Automatic Voltage stabilizer will be provided with each unit.	
2.1.2		The indoor units should be running alternately at an interval of four hours with timer control and the temperature inside the station should be maintained at 25°C inside during all the time including peak summer months. a. Cooling Capacity : 7000 W b. Star Rating : BEE 5-star Inverter with Cooper Coil c. Indoor Noise Level : 40-50 dB(A) (cooling) d. Control Type : Remote e. Compressor : Inverter f. Refrigerant : Eco Friendly g. Feature : filter clean Indicator, defrosting Sensor h. Power supply : 230Volts ± 10Volts AC and 50 Hz ± 3% i. Standard Warranty j. Remote : LCD Wireless.	

Code No.: 2.2			
Equipment Name: Air Conditioner, Split Type, Wall/Roof Mounted			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
2.2	**SPLIT AIR CONDITIONER (1.0 TON CAPACITY)**		
2.2.1	Type & Capacity	Split type, 1 ton cooling only capacity Inverter AC, Wall/Roof mounted of 5-star rating with an automatic timer. Separate Automatic Voltage stabilizer will be provided with each unit.	
2.2.2		The indoor units should be running alternately at an interval of four hours with timer control and the temperature inside the station should be maintained at 25°C inside during peak summer months. a) Cooling Capacity : 3400 W b) Star Rating : BEE 5-star Inverter with Cooper Coil c) Indoor Noise Level: 40-50 dB(A) d) Control Type : Remote e) Compressor : Inverter f) Refrigerant : Eco Friendly g) Feature : filter clean Indicator, Pre-coated Aluminium fins etc. h) Power supply : 230Volts ± 10Volts AC and 50 Hz±3% i) Standard Warranty j) Remote : LCD Wireless.	

Code No.: 3.1				
Equipment Name: Online UPS 10 kVA				
Quantity:			Model:	
S. No.	**DPCC SPECIFICATION**			**BIDDER'S RESPONSE**
3.1	**ONLINE UPS 10 kVA, CAPACITY (Three-Phase I/P & Single-Phase O/P, with 01 hours backup) (for Air Conditioner)**		**Three-phase 10 kVA UPS along with Automatic Delayed Restoration Device (ADRD) with 1 hour backup in full capacity should be provided for the smooth operation of one 2-Ton capacity split AC at the station. <u>Automatic Phase Sequencer Device has tobe installed along with the UPS.</u>**	
3.1.1	Capacity		10.0 kVA	
3.1.2	Technology		PWM using IGBT / MOSFETS	
3.1.3	Crest Factor		More than 3:1	
3.1.4	Input	Voltage	415 V AC	
		Voltage Range	± 25%	
		Frequency	50 Hz ± 3%	
3.1.5	Output	Voltage	230 V AC	
		Voltage regulation	± 1%	
		Frequency	50 Hz	
		Frequency regulation	± 0.01%	
		Waveform	Pure sine wave	
3.1.6	Battery	Battery type	Sealed maintenance free	
		Back up time	1 Hour at full load	
		Battery Capacity	For required backup time	
		Recharge time	5 hrs to 90% after complete discharge	
3.1.7	Distortion		Less than 1% on linear load	
3.1.8	Power factor		0.9 to 1	
3.1.9	Indicator		L.E.D. – Battery Charge, Load level, on Line, over load, on battery, replace battery	
3.1.10	Alarm		Audible alarm for battery backup, battery low, and fault	
3.1.11	Protections	Surge	Surge suppressionmeets BISor International standard	
		Overload	Fuse & current limited	

Code No.: 3.1				
Equipment Name: Online UPS 10 kVA				
Quantity:			Model:	
S. No.	**DPCC SPECIFICATION**			**BIDDER'S RESPONSE**
		Short circuit	Fuse & current limited &cut-off	
		Battery low cut-off	No battery drain after cut-off	
3.1.12	Overload Capacity		110% for continuous load	
3.1.13	Efficiency		More than 90%	
3.1.14	Environment	Operating Temperature	0 – 50 °C	
		Operating Humidity	10% to 95% (Non condensing)	
		Audible Noise	Less than 45 dB (at 1 meter)	

Code No.: 3.2				
Equipment Name: Online UPS 5 kVA				
Quantity:			Model:	
S. No.	**DPCC SPECIFICATION**			**BIDDER'S RESPONSE**
3.2	**ONLINE UPS 5 kVA, CAPACITY (Single-Phase I/P & Single-Phase O/P, with 02 hours backup) (01 for Analysers& 01 for Server at Central Station)**		**Single phase 5 kVA UPS along with Automatic Delayed Restoration Device (ADRD) with 2 hours backup in full capacity should be provided for the smooth operation of Analyzers and peripherals at the station**	
3.2.1	Capacity		5.0 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	230 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 complete 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, on Line, 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 suppressionmeets BISor International standard	
		Overload	Fuse & current limited	
		Short circuit	Fuse & current limited & cut-off	
		Battery low cut-off	No battery drain after cut-off	

Code No.: 3.2				
Equipment Name: Online UPS 5 kVA				
Quantity:			Model:	
S. No.	**DPCC SPECIFICATION**			**BIDDER'S RESPONSE**
3.2.12	Overload Capacity		110% for continuous load	
3.2.13	Efficiency		More than 90%	
3.2.14	Environment	Operating Temperature	0 – 50 °C	
		Operating Humidity	10% to 95% (Non condensing)	
		Audible Noise	Less than 45 dB (at 1 meter)	

Code No.: 4		
Equipment Name: CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYZERS FOR SO2, NO-NO2-NOx-NH3, CO, O3		
Quantity:	Model:	
S. No.	**DPCC SPECIFICATION**	**BIDDER'S RESPONSE**
4.1	**General Specifications for all Analysers**	
4.1.1	The analyzers should be 19" rack mounting model with facilities for fixing the analyzers from front side.	
4.1.2	The front panel preferably have ON / OFF Switch.	
4.1.3	The display of the entire important status signal viz. Sample flow, temperature, concentration, range selection, manual / auto mode, zero / span mode and all error messages should be on front panel.	
4.1.4	The analyzers should operate at operating voltage 230 volts ± 10 volts AC and 50 Hz ± 3% frequency. The power supply input to be protected against spikes from and to the analyzer by an LC filter. The power connection cable should be CEE type complete with 15 Amperes plug adaptable to Indian mains socket.	
4.1.5	The analyzers must function properly in Indian conditions without any defect between 0 – 40°C ambient temperature, 10 – 95% relative humidity and in high ambient dust levels. The data capture rate should not be less than 90% of operational time.	
4.1.6	The Manufacturer shall provide comprehensive hands-on training for operational & preventive maintenance for one week in the respective State for three persons per station.	
4.1.7	The analyzers should complete with calibration system. The calibration system should be delivered along-with respective span gas cylinder and permeation tubes. The span gas concentration should be within 60 – 90% of first measuring range. **The analyzer must have zero point internal calibration system and in agreement with minimum detection limit of each analyzer.** The calibration procedures are to be integrated into the software system for automatic calibration & remote calibration.	
	CALIBRATION GAS CYLINDER	
4.1.8	**The supplier has to supply the calibration gas cylinder (highly polished aluminium 10 liters water capacity), along with SS Regulator, traceable to NIST for each components (SO_2, NO, CO, NH_3, Benzene & Toluene) along with SS regulator for the multipoint calibration.** The synthetic air and N_2 cylinder (99.99% purity with certificate) should be in Carbon Steel cylinder of 47 Liters water capacity along with SS Regulator.	
4.1.9	The analyzers shall be supplied with all ancillaries necessary for operation with pump (preferably in built) and any other items such as charcoal scrubber, Teflon air sample intake filter, drier, Teflon tubing suitable for connection to air sampling manifold. All such items are to be itemized. Dust filter in all the analyzers should be provided before solenoid valve to protect frequent chocking	

Code No.: 4			
Equipment Name: CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYZERS FOR SO2, NO-NO2-NOx-NH3, CO, O3			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
	of solenoid valve.		
4.1.10	The connector systems for out-going signal for recording and the computer terminal should be on back panel with screw type connecting pins.		
4.1.11	All **ambient gas analyzers shall be approved by the USEPA / TUV**. However, **in case of BTEX Analyzer, it shall be approved by USEPA/TUV/MCERT**. For Ammonia Analyzer, specifications as given will be considered. **Method of measurement used shall also comply with the stipulation on National Ambient Air Quality Standards (NAAQS) 2009** (Details of Methods of Measurement is available at MoEF and CPCB websites). All analyzers shall be micro-processor controlled with automatic calibration using an external dilution calibrator and calibration standards. All analyzers should be fully integrated in the rack cabinet, fully calibrated & tested before supply and ready for start-up at the respective sites. Analyzer must exhibit performance equal to or better than values specified in the Calibration & test certificate provided with each analyzer.		
4.1.12	The manufacturer shall specify the cross sensitivity of measurement for all the analyzers.		
4.1.13	Each set of analyzers shall be supplied with two copies of elaborate operation manuals comprising details as below: • **Parts (I)** should comprise installation, operational and troubleshooting details; • **Parts (II)** should have details about preventive, routine and corrective maintenance; • **Parts (III)** should comprise details of all electrical, electronic and pneumatic circuit diagrams, details of each spare parts, catalogue No. etc. and details of each electronic card / PCB's; and • **Parts (IV)** Schematic diagram for possible repair & maintenance. • **Parts (V)** Standard Operating Procedure (SOP) for each analyzer. • **Parts (VI)** List of equipments and other accessories along with contact details of supplier.		
4.1.14	Digital Output	a) Multi drop RS 232 port shared between gas Analyzers, Dust Analyzer ($PM_{2.5}$& PM_{10}), Meteorological Sensors and computer for data, status and control. Communication should have a USB	

Code No.: 4			
Equipment Name: CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYZERS FOR SO2, NO-NO2-NOx-NH3, CO, O3			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
		port, TCP/IP Ethernet connection	
4.1.15	Quality Control and Standard	Data shall be collected and validated according to US EPA standards, using the methodologies included in 40 Code of Federal Regulations. All analyzers shall have current US EPA reference or equivalent method designation and shall be of the latest design. The supplier **shall submit a Standard Operating Procedure for the air quality monitoring stations to the Buyer at the time of bid submission.** This Standard Operating Procedure shall be approved by the Buyer prior to award. The **Standard Operating Procedure shall contain the following:** i. Operating procedures for all analyzers and meteorological sensors ii. Calibration procedures iii. Calibration schedule iv. Maintenance procedures v. Maintenance schedule vi. Data validation procedures vii. Quality Assurance procedures viii. Sample quality assurance documentation ix. Sample Air Quality Report The calibration procedures for analyzers shall conform to US EPA methodologies and shall include daily calibration checks, by weekly precision checks and linearity checks every six weeks. All analyzers shall undergo full calibration in every three months. Data obtained from these calibration checks and copies of associated Quality Assurance and calibration documentation, shall be submitted to the Buyer along with the Air Quality Data. Air Quality Data shall be submitted to the Buyer on Real Time basis through automated system and on a monthly basis in the form of an Air Quality Report. This report shall include tabular and graphic information on gas and dust concentrations as well as meteorological	

Code No.: 4			
Equipment Name: CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYZERS FOR SO2, NO-NO2-NOx-NH3, CO, O3			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
		data for each site. The data shall be reported in the form of 15-minute averages and shall also include daily, weekly and monthly averages, minimum, maximum, standard deviations, total data captured and percent data capture. It should also have stat validation mechanism and delayed data check mechanism. The Air Quality Report shall also include wind roses where wind speed and direction are measured.	
4.2	**SAMPLING SYSTEM**	**A suitable sampling system as specified by USEPA having 10 ports manifold and fitted with a suction pump to draw ambient air. System duly equipped with moisture removal systems should be provided for sampling of ambient air separately for gaseous and dust measurement.**	
	Gases sampling system:		
4.2.1	Height of the sampling system	Approx. 1.0 meter above the roof	
4.2.2	Roof entry cut out	Stainless Steel	
4.2.3	Conduit	Stainless Steel	
4.2.4	Inner sampling system	Borosilicate glass	
4.2.5	Sampling head	Stainless Steel	
4.2.6	Manifold	10 port for tubes 6 x 1 mm, self-tightening	
4.2.7	Sample air flow sensor	Uni-directional sample airflow measuring device should be installed at the sampling system to measure the flow of ambient air through sampling system. The output of signal should be connected to computer to ascertain the continuous flow of sample from ambient air. The suction pump operational status should also be connected to the computer as a separate channel.	
4.3	**19" RACK**	**Suitable19" Rack cabinet to accommodate all analyzers, calibrators, Zero air generators, data logger etc. The dimension of the rack without doors, with aluminum section**	

Code No.: 4			
Equipment Name: CONTINUOUS AMBIENT AIR QUALITY MONITORING ANALYZERS FOR SO2, NO-NO2-NOx-NH3, CO, O3			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
		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 475mm (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.	

Code No.: 5.1			
Equipment Name:AMBIENT SULPUR DIOXIDE (SO2) ANALYSER			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
5.1	**AMBIENT SULPUR DIOXIDE (SO2) ANALYSER**		
5.1.1	Principle	UV Fluorescence	
5.1.2	Measurement	SO_2 in Ambient Air	
5.1.3	Display	Digital	
5.1.4	Ranges	Auto ranging 0-200 ppb	
5.1.5	Lower Detectable Limit	1 ppb	
5.1.6	Noise Level	0.5 ppb	
5.1.7	Zero Drift	< 1 ppb/24 Hrs. with automatic zero compensation	
5.1.8	Span Drift	< 1 ppb in 24 hrs.	
5.1.9	Linearity	± 1% of full scale	
5.1.10	Response Time	120 sec or less	
5.1.11	Calibration	Please see Multi-calibration section (S. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9)	
5.1.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA	
5.1.13	Digital Output	Multiple drop RS 232, USB port /TCP/IP, Ethernet	
5.1.14	Approval	USEPA/TUV approved Analyzer	

Code No.: 5.2			
Equipment Name:AMBIENT OXIDES OF NITROGEN (NO-NO2-NOX) ANALYSER			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
5.2	**AMBIENT OXIDES OF NITROGEN (NO-NO_2-NO_X) ANALYSER**		
5.2.1	Principle	Chemiluminescence	
5.2.2	Measurement	NO-NO_2-NO_X in Ambient Air	
5.2.3	Display	Digital	
5.2.4	Ranges	Auto ranging 0-2000 ppb	
5.2.5	Lower Detectable Limit	1 ppb	
5.2.6	Noise Level	0.5 ppb	
5.2.7	Zero Drift	< 1 ppb/24 Hrs.	
5.2.8	Span Drift	< 2% in 15 days of full scale	
5.2.9	Linearity	± 1% of full scale	
5.2.10	Response Time	120 sec or less	
5.2.11	Calibration	Please see Multi-calibration section (S. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).	
5.2.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA	
5.2.13	Digital Output	Multi drop RS 232 port, USB port /TCP/IP, Ethernet	
5.1.14	Approval	USEPA/TUV approved Analyzer	

Code No.: 5.3			
Equipment Name:AMBIENT AMMONIA ANALYSER (NH_3)			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
5.3	**AMBIENT AMMONIA ANALYSER (NH_3)**		
5.3.1	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)	
5.3.2	Measurement	NH_3 in Ambient Air	
5.3.3	Display	Digital	
5.3.4	Ranges	Auto ranging 0-1000 ppb	
5.3.5	Lower Detectable Limit	1 ppb	
5.3.6	Noise Level	0.2% of reading	
5.3.7	Zero Drift	< 5 ppb /24 Hrs.	
5.3.8	Span Drift	< 2% in 15 days of full scale	
5.3.9	NH_3/NO converter	Quartz at approx. 1000 °C	
5.3.10	Linearity	± 1% of full scale	
5.3.11	Response time	< 300 second	
5.3.12	Rise / fall Time (95% of the final value)	< 30 Sec	
5.3.13	Calibration	Please see Multi-calibration section (S. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).	
5.3.14	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA /4 – 20 mA a Digital output	
5.3.15	Digital Output	Multi drop RS 232 port, USB port /TCP/IP, Ethernet	
5.3.16	Approval	USEPA/TUV approved Analyzer	

Code No.: 5.4			
Equipment Name:AMBIENT CARBON MONOXIDE (CO) ANALYSER			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
5.4	**AMBIENT CARBON MONOXIDE (CO) ANALYSER**		
5.4.1	Principle	Non Dispersive Infra-Red (NDIR) with Gas Filter Correlation/ Cross Flow Modulation Method	
5.4.2	Measurement	CO in Ambient Air	
5.4.3	Display	Digital	
5.4.4	Ranges	Auto ranging 0 - 100 ppm.	
5.4.5	Lower Detectable Limit	0.1 ppm	
5.4.6	Noise Level	0.05 ppm with time constant ± 30 seconds	
5.4.7	Zero Drift	< 0.2 ppm/7 days	
5.4.8	Span Drift	< 1% full scale in 24 hrs.	
5.4.9	Linearity	Continuous ± 1%	
5.4.10	Response Time	60 seconds or less	
5.4.11	Calibration	Please see Multi-calibration section (S. No. 7) and also calibration section in General Specifications (4.1.7 to 4.1.9).	
5.4.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA	
5.4.13	Digital Output	Multiple drop RS 232port, USB port /TCP/IP, Ethernet	
5.4.14	Approval	USEPA/TUV approved Analyzer	

Code No.: 5.5			
Equipment Name:AMBIENT OZONE (O_3) ANALYSER			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
5.5	**AMBIENT OZONE (O_3) ANALYSER**		
5.5.1	Principle	UV Photometric / Chemiluminescence	
5.5.2	Measurement	O_3 in Ambient Air	
5.5.3	Display	Digital	
5.5.4	Range	Auto ranging 0 - 500 ppb	
5.5.5	Lower Detectable Limit	1.0 ppb	
5.5.6	Noise level	± 0.5 ppb	
5.5.7	Zero Drift	< ½% per month	
5.5.8	Span Drift	< 1% per month	
5.5.9	Linearity	Continuous ± 1%	
5.5.10	Response Time	30 seconds or less	
5.5.11	Calibration	With built-in Zero and span generator and also see Multi-calibration section (S. No. 7)	
5.5.12	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA	
5.5.13	Digital Output	Multiple drop RS 232 port, USB port /TCP/IP, Ethernet	
5.5.14	Approval	USEPA/TUV approved Analyzer	

Code No.: 5.6			
Equipment Name:AMBIENT BTEX ANALYSER			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
5.6	**AMBIENT BTEX ANALYSER**		
5.6.1	GENERAL	A complete analyzer system comprising of sampling pump, transfer line, 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. Continuous unattended measurement system of individual BTEX should work without external cryogenic cooling. System should have protocol compatible to communicate & transfer data to DAS. Raw data storage capacity without erase minimum for three month or more. The system should be delivered with all necessary spares, consumables, tubing etc. for making it functional.	
5.6.2	TECHNICAL SPECIFICATIONS	A single stage membrane Pump collect ambient sample automatically an inbuilt adsorption trap. Subsequent, the sample will be dissolved and injected on wide bore capillary gas chromatographic separation. Sample volume controlled by thermal mass flow controller (dust protected). Sample flow range may be 20 -100 ml/min or more (adjustable). Sample volume should be between 400 ml – one liter or more of ambient air over a 10-15 min sampling cycle. All sample transfer tubing should be in stainless steel and flow & pressure sensor to be preferred with digital display.	
5.6.3	DETECTOR	Photo Ionization Detector **(PID)** or other equivalent detector as per EPA/EU/TUV/MCERT approved specifications, 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 10.6 eV. PID sensitivity sensor should be available to check sensitivity.	
5.6.4	**MINIMUM SPECIFICATIONS**		
5.6.4.1	Principle	Based on gas Chromatographic separation and Photo Ionization Detector (PID)	
5.6.4.2	Measurement	Benzene, Toluene, Ethyl-benzene, m,p-Xylene and O-Xylene.	
5.6.4.3	Display	Digital	
5.6.4.4	Range	0 - 100 ppb (0.32 – 325 µg/m^3)	
5.6.4.5	Lower Detectable Limit	0.2 ppb (0.65 µg/m3) for 15 min cycle for Benzene	
5.6.4.6	Temperature Range	5 – 35 °C or more	
5.6.4.7	Repeatability	Retention Time :< 0.1% RSD Concentration :< 1.0% RSD	
5.6.4.8	Typical Cycle Time	Total Cycle Time should not exceed 15min i.e. Sample Collection Time - 15 min approx. Analytical Time - 15 min approx.	
5.6.4.9	Sample Volume	1 liter for 15 min cycle.	
5.6.4.10	Desorption tube	Carbotrap	
5.6.4.11	Pre concentration	Carbopack	
5.6.4.12	Calibration	The Analyzer should be capable to calibrate through Multi Calibration System also. Please see Multi-calibration section (S. No. 7) And also calibration section in General Specifications (4.1.7 & 4.1.9).	
5.6.4.13	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA	
5.6.4.14	Digital Output	Multi drop RS 232 port, USB port /TCP/IP, Ethernet	
5.6.4.15	Approval	USEPA/TUV/ MCERT approved BTEX Analyzer	

Code No.: 6.1			
Equipment Name:CONTINUOUS PM_{10} MONITORING ANALYSER (β-RAY ATTENUATION)			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
6.1	**CONTINUOUS PM_{10} MONITORING ANALYSER (β-RAY ATTENUATION)**	**Based on the principle of β-ray attenuation, particulate sampled through the instrument and collected on fiberglass filter tape. Before and after sampling, b-ray radiation is measured by scintillation / G.M. counter. An internal microprocessor handles all sequences and automatically calculates the concentration of PM_{10}.**	
6.1.1	Principle	β-ray attenuation	
6.1.2	Particle Size Cut Off	0 - 10 Microns	
6.1.3	Measuring Range	0 – 1000 µg/m^3	
6.1.4	Resolution	1% of the measurement range	
6.1.5	Lower Detection Limit	< 4.8 µg/m^3 (1 hour)	
6.1.6	Detector	Plastic Scintillator/ GM Counter/ Silicon-Semiconductor base	
6.1.7	Air Flow Rate	16.7 Liters / minute	
6.1.8	Filter Material	Glass Fiber Filter	
6.1.9	Display	LED / LCD	
6.1.10	Sampling Head	Dynamic heated sampling line with proper outer insulation for measurement of PM_{10}, with adjustable temperature 20-70 °C	
6.1.11	Calibration	Reference membrane facility should be provided for calibration of analyzer	
6.1.12	Compatibility	Analyzer should be compatible with protocols of DAS system to be used in station	
6.1.13	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA	
6.1.14	Digital Output	Multi drop RS 232 port USB port /TCP/IP /Ethernet	
6.1.15	Roll Length	Minimum 20 meters	
6.1.16	Measurement cycle time	1 hour	
6.1.17	Approval	USEPA/TUV approved Analyzer	

Code No.: 6.2			
Equipment Name:CONTINUOUS $PM2_{.5}$ MONITORING ANALYSER (β-RAY ATTENUATION)			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
6.2	**CONTINUOUS $PM_{2.5}$ MONITORING ANALYSER (β - RAY ATTENUATION)**	**Based on the principle of β-ray attenuation, particulate sampled through the instrument and collected on fiberglass filter tape. Before and after, sampling b-ray radiation is measured by scintillation / G.M. counter. An internal microprocessor handles all sequences and automatically calculates the concentration of $PM_{2.5}$.**	
6.2.1	Principle	β-ray attenuation	
6.2.2	Particle Size Cut Off	0 – 2.5 Microns	
6.2.3	Measuring Range	0 – 1000 $\mu g/m^3$	
6.2.4	Resolution	1% of the measurement range	
6.2.5	Lower Detection Limit	< 4.8 $\mu g/m^3$ (1 hour)	
6.2.6	Detector	Plastic Scintillator/ GM Counter/ Silicon-Semiconductor base	
6.2.7	Air Flow Rate	16.7 Liters / minute	
6.2.8	Filter Material	Glass Fiber Filter	
6.2.9	Display	LED / LCD	
6.2.10	Sampling Head	Dynamic heated sampling line with proper outer insulation for measurement of $PM_{2.5}$, with adjustable temperature 20-70 °C	
6.2.11	Calibration	Reference membrane facility should be provided for multipoint calibration of analyzer	
6.2.12	Compatibility	Analyzer should be compatible with protocols of DAS system to be used in station	
6.2.13	Roll Length	Minimum 20 meters	
6.2.14	Analog Output	0 – 1 V, 0 – 10 V, 2 – 20 mA / 4 – 20 mA	
6.2.15	Digital Output	Multi drop RS 232 port USB port /TCP/IP, Ethernet	
6.2.16	Measurement cycle time	1 hour	
6.2.17	Approval	USEPA/TUV approved Analyzer	

Code No.: 7			
Equipment Name: MULTICALIBRATOR			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
7.1	MULTI POINT GAS CALIBRATION SYSTEM	1. The Gas Calibration System should be capable to do the following: (i) Multipoint calibration using automatic dilution system for the calibration of SO_2, NO, CO, NH_3 and BTEX analyser. (ii) Auto calibration (user selectable). (iii) Generate zero air of 99.9% purity (High Performance Zero Air Generator to be provided). (iv) Having facility for O_3 Generator for stable and repeatability calibration. (v) Gas Phase Titration (GPT) with O_3 generator having 100% converter efficiency for conversion of NO to NO_2. (vi) Calibration using permeation tubes for which at least two chambers based Permeation system has to be provided. (vii) The Permeation System should be capable to accept permeation tubes up to 6cm in length and 2cm in diameter with user selectable temperature setting of 40°C and 50°C. 2. System should be 19" rack mountable. 3. System should be DAS compatible for remote calibration from Central Server. 4. The system should also have facility for multipoint calibration of Ozone analyzer.	
7.2	METEOROLOGICAL, FLOW AND ELECTRONICS CALIBRATION	**The supplier should provide calibration devices or calibration check devices for all the meteorological parameters** namely temperature, wind speed, wind direction, relative humidity, solar radiation, rain fall as per the specifications of the manufacturers.	

Code No.: 8			
Equipment Name: METEROLOGICAL SYSTEM			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
8.1	METEROLOGICAL 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. The specifications are as follows	
(A)	**WIND SPEED**		
8.1.A.1	Range (Operation)	0-60 m/s or better	
8.1.A.2	Sustainability	Upto 75 m/sec	
8.1.A.3	Accuracy	± 0.5 m/sec or better	
8.1.A.4	Resolution	0.1 m/sec	
8.1.A.5	Sensor Type	Ultrasonic	
8.1.A.6	Threshold	0.5 m/sec or less	
8.1.A.7	Response time	10 sec or better	
(B)	**WIND DIRECTION**		
8.1.B.1	Range	0 – 359 degree	
8.1.B.2	Accuracy	± 3 degree or better	
8.1.B.3	Resolution	1 degree	
8.1.B.4	Sensor type	Ultrasonic	
8.1.B.5	Threshold	0.5 m/sec or less	
8.1.B.6	Response time	10 sec or better	
(C)	**AMBIENT TEMPERATURE**		
8.1.C.1	Range	-10°Cto 60°C	
8.1.C.2	Accuracy	± 0.2°C or better (with radiation shield)	
8.1.C.3	Response	10 seconds in still air	
8.1.C.4	Resolution	0.1 °C	
8.1.C.5	Sensor type	Resistance type	
8.1.C.6	Response time	10 sec or better	
(D)	**RELATIVE HUMIDITY**		
8.1.D.1	Range	0 to 100% RH	
8.1.D.2	Accuracy	± 3.0 % or better	
8.1.D.3	Resolution	1%	
8.1.D.4	Sensor type	Capacitive / Solid State	
8.1.D.5	Response Time	10 sec or better	
(E)	**SOLAR RADIATION**		
8.1.E.1	Range	0 to 1500 W/m^2 or better	
8.1.E.2	Accuracy	± 5.0 % or better	
8.1.E.3	Resolution	$5W/m^2$	

Code No.: 8			
Equipment Name: METEROLOGICAL SYSTEM			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
8.1.E.4	Sensor type	Silicon Photo diode	
(F)	**RAINFALL**		
8.1.F.1	Range	0.2 mm/hr to 100 mm/hr	
8.1.F.2	Accuracy	± 5% or better	
8.1.F.3	Resolution	0.2 mm	
8.1.F.4	Sensor type	Tipping bucket rain gauge or any other suitable sensor	
8.1.F.5	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:**	
8.1.G.1	Extended Height	10 meters	
8.1.G.2	Retracted Height	2 metres	
8.1.G.3	Wind load Limit	0.7896 sq. m. (8.5 sq. ft.) at 50 mph	
8.1.G.4	Number of Sections	4	
8.1.G.5	Construction material	Galvanised steel or aluminium	

Code No.: 9			
Equipment Name: DATA ACQUISITION AND COMMUNICATION SYSTEM			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
9.1	TYPICAL ARCHITECTURE FOR DATA CONNECTIVITY	Details as mentioned in Section VII of the bid document.	
9.2	DATA ACQUISITION AND HANDLING SYSTEM AT STATION	Details as mentioned in Section VII of the bid document.	
9.3	WORKSTATION COMPUTER FOR AQI	Details as mentioned in Section VII of the bid document.	
9.4	MANAGEABLE CISCO SWITCH (RACK MOUNTABLE)	Details as mentioned in Section VII of the bid document.	
9.5	REMOTE MONITORING TOOL/ SOFTWARE	Details as mentioned in Section VII of the bid document.	
9.6	21U BLACK INDUSTRIAL RACK	Details as mentioned in Section VII of the bid document.	
9.7	RACK SERVER	Details as mentioned in Section VII of the bid document.	
9.8	WIRELESS ACCESS POINT (AP)	Details as mentioned in Section VII of the bid document.	
9.9	UTM (UNIFIED THREAT MANAGEMENT) DEVICE	Details as mentioned in Section VII of the bid document.	
9.10	PRINTER SPECIFICATIONS	Details as mentioned in Section VII of the bid document.	
9.11	CONNECTIVITY FOR DATA TRANSFER	Details as mentioned in Section VII of the bid document.	

Code No.: 10			
Equipment Name: DATA ACQUISITION SOFTWARE FOR STATION (CAAQM)			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
10	DATA ACQUISITION SOFTWARE FOR STATION (CAAQM)	Details as mentioned in Section VII of the bid document.	

Code No.: 11			
Equipment Name: DATA ACQUISITION SOFTWARE AT THE CENTRAL STATION AT EACH SPCB & CPCB			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
11	DATA ACQUISITION SOFTWARE AT THE CENTRAL STATION AT EACH SPCB & CPCB	Details as mentioned in Section VII of the bid document.	

Code No.: 12			
Equipment Name: DISPLAY BOARD DATA TRASMISSION DEVICE			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
12.1	PROCESSOR	Intel® Corei5 equivalent Or Better	
12.2	Memory	6 GB, Memory slots for Micro SD or full size SD card slot with Memory support for at-least 8 GB	
12.3	Ports	a. One HDMI b. LAN Port for EthernetNetwork Connection Minimum of 3 USB Port with support for USB 2.0 or USB 3.0.	
12.4	OS Support	Linux, or Windows OS	
12.5	Communication Options	a. LAN Communication Wifi Communication – Wifi Hotspot enabled/ GPRS Comm. Enabled	
12.6	Power Supply	5 to 12 V DC through 220V 50Hz AC Supply adapter or USB driven.	
12.7	Size	Mechanical Chassis Size not to exceed 10'' x 6''x 6'' with stand alone tower/box.	
12.8	Operating Environment	Operating Temperature 0°C to + 50°C Humidity upto 90%	
12.9	Device Support	05 Years	
12.10	Antivirus	It should be secured. If Windows, then licensed anti- virus should be there during the project duration.	
12.11	General	Supplier will configure and deploy the communication mechanism. **Complete manual of the device should be provided.**	
12.12	Accessories	01 Meter HDMI Cable	
12.13	Internet	To be provided by the vendor either through GSM SIM or through Wifi Enabled Dongles.	
12.14	Display Board should show	Last data saved.	
12.15	Display Board should show	Last updated time should be displayed	
12.16	Software	The vendor is responsible to provide software which can download the data from Station computer, AQI, Advertisements etc. store it and display on the Display Board seamlessly.	

Code No.: 13			
Equipment Name: DAY LIGHT & NIGHT VISIBLE TRUE COLOR DATA DISPLAY SYSTEM			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
(A)	**LOCATION NEAR TO CAAQM STATION**		
13.A.1	Size and Display System (H x W) feet and Pixel	4 x 8 feet, P6, 6 mm (+/- 05 mm) pixel pitch	
13.A.2	Visibility Range	~10 Meters (Day time)	
13.A.3	Brightness	7000 NIT or higher	
13.A.4	Display of Colour Elements	SMD 3535 or better	
13.A.5	Minimum Life span of the system	LED Life 100000 Hours	
13.A.6	Viewing angle	Viewing angle of 140°Horizontal/140°Vertical	
13.A.7	Operating and Non-operating Temperature	-15°C to 55°C	
13.A.8	No of Color	281 trillion Colors, 256 brightness level dimming capability	
13.A.9	Data processing	16-bit data processing, 100 % Digital	
13.A.10	Scan rate and refresh frequency	Scan Ratio 1:1 and with minimum 1920 Hz refresh frequency	
13.A.11	LED internal and External Cabinet type	Internal LED frame should be made of Aluminium and External cabinet should be factory made without pin holes, LED Display should be serviceable from front and back.	
13.A.12	Color Temperature - Adjustable	4500 - 9000 K range	
13.A.13	Input Power Requirement/ Consumption	220 V, 50/60Hz, Power consumption 200 W (maximum)/m2	
13.A.14	Display Board Mounting	Structure based upon location. Uni-Pole (05 meters) arrangement or Handing is in the scope of supplier.	
13.A.15	General	The system should also have the facility to display the environmental picture through video camera/vcr/cd player etc. for public awareness.	
13.A.16	Power Cable Laying	Depending upon location, cabling is to be done by the firm.	
13.A.17	Device at Display Board to pick up data from stations and transmit it to LED Display	Display data connectivity device/system with GSM SIM has to be installed nearby LED board which will pick up data from station computer through Internet. LED to be placed away from through Internet. LED to be placed away fromthe station premises.	
13.A.18	Certification	BIS	
13.A.19	IP Rating	Display Module IP67, Cabinet IP65	
(B)	**LOCATION AT STATE POLLUTION CONTROL BOARD (SPCB)**		

13.B.1	Size and Display System (H x W) feet and Pixel	4 x 8 feet, P6, 6 mm (+/- 05 mm) pixel pitch	
13.B.2	Visibility Range	~10 Meters (Day time)	
13.B.3	Brightness	7000 NIT or higher	
13.B.4	Display of Colour Elements	SMD 3535 or better	
13.B.5	Minimum Life span of the system	LED Life 100000 Hours	
13.B.6	Viewing angle	Viewing angle of 140° Horizontal/140° Vertical	
13.B.7	Operating and Non-operating Temperature	-15°C to 55°C	
13.B.8	No of Color	281 trillion Colors, 256 brightness level dimming capability	
13.B.9	Data processing	16-bit data processing, 100 % Digital	
13.B.10	Scan rate and refresh frequency	Scan Ratio 1:1 and with minimum 1920 Hz refresh frequency	
13.B.11	LED internal and External Cabinet type	Internal LED frame should be made of Aluminium and External cabinet should be factory made without pin holes, LED Display should be serviceable from front and back.	
13.B.12	Color Temperature - Adjustable	4500 - 9000 K range	
13.B.13	Input Power Requirement/ Consumption	220 V, 50/60 Hz, Power consumption 200 W (maximum)/m2	
13.B.14	Display Board Mounting	Structure based upon location. Uni-Pole (05 meters) arrangement or Handing is in the scope of supplier.	
13.B.15	General	The system should also have the facility to display the environmental picture through video camera/vcr/cd player etc. for public awareness.	
13.B.16	Power Cable Laying	Depending upon location, cabling is to be done by the firm.	
13.B.17	Device at Display Board to pick up data from stations and transmit it to LED Display	Display data connectivity device/system with GSM SIM has to be installed nearby LED board which will pick up data from station computer through Internet. LED to be placed away from through Internet. LED to be placed away from the station premises.	
13.B.18	Certification	BIS	
13.B.19	IP Rating	Display Module IP67, Cabinet IP65	

Code No.: 14			
Name: Annexure			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
(A)	Drawing of a CAAQM Station	Details as mentioned in Section VII of the bid document.	
(B)	Architecture of CAAQM Station	Details as mentioned in Section VII of the bid document.	
(C)	Protocol for Data Transmission from CAAQM Stations	Details as mentioned in Section VII of the bid document.	

Code No.: 15, 16			
Name: Annexure-I, References			
Quantity:		Model:	
S. No.	**DPCC SPECIFICATION**		**BIDDER'S RESPONSE**
15	Annexure-I	Details as mentioned in Section VII of the bid document.	
16	References	Details as mentioned in Section VII of the bid document.	

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