

TENDER DOCUMENT

TENDER NO.: S-CEM/IP/1080/GTE/100-01/2019-2020

SUB: Supply, installation, Commissioning, Performance testing and validation of RF Shielded Anechoic Chamber

DUE ON

29.11.2019 : 14.00 Hrs.



SOCIETY FOR APPLIED MICROWAVE ELECTRONICS
ENGINEERING AND RESEARCH

(An Autonomous R&D Institution under the Ministry of Electronics &
Information Technology, Govt. of India)

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NOTICE INVITING TENDER(NIT)
(Submission of Tender in Two Bid Format)

Sealed Tenders are invited under Two Bid format (Technical & Commercial) from reputed Manufactures/ Indian agent of foreign principals for the supply of item mentioned below.

Sl. No.	Item Description	Quantity	Earnest Money Deposit (EMD)			
			(In Indian Rupees)	US (\$)	Euro (€)	Sfr (CHF)
1.	3m RF Shielded Anechoic Chamber and Shielded conducted susceptibility room	One	20, 00,000/-	27855	25710	27999
			Cost of Tender			
			(In Indian Rupees)	US (\$)	Euro (€)	Sfr (CHF)
			2,500/-	35.33	32.15	35.00

Tender Documents can be downloaded from SAMEER-CEM website<<http://cem.sameer.gov.in>> and CPPP website<<https://eprocure.gov.in/cppp/>>

IMPORTANT DATES

SAMEER-CEM,Chennai invites bids from interested parties for **Supply, installation, commissioning , performance testing and validation of RF Shielded Anechoic Chamber as per the schedule mentioned below.**

Tender Schedule

Tender Reference No.	S-CEM/IP/1080/GTE/100-01/2019-2020
Date and time of publishing and downloading of bid document	16 th October, 2019
Date of Pre-Bid Meeting	31 st October 2019 at 11:00 Hrs. in Conference Hall of SAMEER-CEM,2nd Cross Road, Taramani, Chennai - 600 113
Last date and time of submission of bids	29 th November 2019 at 14:00 Hrs
Date, time and Place of opening of Technical Bid.	29 th November,2019 at 15:00 Hrs. at SAMEER-CEM,2nd Cross Road,Taramani,Chennai - 600 113
Date and time of opening of financial Bids	To be announced later
Validity of Tender	180 days
EMD	Rs.20,00,000/- (Rupees twenty lakhs only)
Cost of Tender	Rs.2500/- (Rupees two thousand and five hundred only) Non-refundable.

IMPORTANT TO NOTE

1. Any queries regarding the tender should be addressed to Head- Administration, SAMEER-CEM, 2nd Cross Road, Taramani, Chennai - 600 113 (either through letter or through e-mail:-ramamoorthi.sameer@nic.in or purchase.chn.sameer@nic.in or contact no.044-22544020/22544061 up to 1 day before pre-bid meeting.
2. All communication, addendum/corrigendum related to this tender will be issued only on the SAMEER-CEM website cem.sameer.gov.in and CPPP.
3. Programme Director, SAMEER-CEM reserves the right to reject any or all the bids without assigning any reason.
4. The Date and time mentioned in the tender schedule shall be strictly adhered .
5. The bids will be opened in the presence of bidders/representatives. If any unscheduled holiday occurs on the date of submission/opening, then next working day shall be prescribed as date of submission/opening. Prospective bidders are requested to submit their offers in **Two-Bid format** only as per tender documents.
6. Requests for postponement of date and time of submission and opening of bids will not be entertained.
7. Fax/e-mail bids will not be accepted
8. Late/Delayed bids shall not be opened

Note-Changes suggested by prospective bidder in Pre-Bid meeting may be incorporated in the tender document at the sole discretion of the tender inviting authority and for which corrigendum will be issued separately and uploaded only on the SAMEER-CEM website cem.sameer.gov.in and CPPP.

**INSTRUCTIONS TO BIDDER (ITB) FOR SUBMISSION OF BID etc.,
AND TERMS & CONDITIONS**

SECTION-A ELIGIBILITY/QUALIFICATION CRITERIA

1. Eligible Bidders

1.1 Bids are invited from manufacturers or their Indian agent of foreign principals specifically authorized by the manufacturers, to quote on their behalf for this tender. The manufacturers or their Indian agent of foreign principals shall have designed, manufactured, tested and supplied the RF shielded anechoic chamber similar to the type specified in the "Technical Specification". Such chamber must be of the most recent series/models, incorporating the latest improvements in design.

1.2 Either the Indian Agent on behalf of the Principal/OEM or Principal/OEM itself can bid, but both cannot bid simultaneously for the same item/product in the same tender.

1.3 If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/ product.

1.4 In case a foreign bidder who does not have an agent in India quotes, then the foreign bidder shall have to furnish a certificate to the effect that the bidder is or will be represented by an agent in India and will be able to carry out the supply, maintenance, repair obligations etc. during the warranty and post-warranty period. In case of non-availability of Indian agent, the foreign bidder shall ensure a mechanism at place for carrying out the supply, maintenance, repair obligations etc. during the warranty and post-warranty period. And also, provide their service visit plan for mandatory visits and breakdown visits.

1.5 Details of service support facilities that would be provided after the warranty period should be submitted in the Service Support Details Form.

1.6 The Bidder will assume total responsibility for the fault-free operation of the chamber, application software, if any, and maintenance during the warranty period and provide necessary maintenance services and availability of spares for ten years after end of warranty period if, required.

1.7 In order to assess the financial solvency of a firm, The Programme Director, SAMEER-CEM may seek a report from the bankers of the technically evaluated lowest quoting firm in order to assess if the firm is financially capable of executing the purchase order/work successfully.

1.8 Bidders who meet the criteria given above are subject to be disqualified, if they have made untrue or false representation in the forms, statements and attachments submitted in proof of the qualification requirements or have a record of poor performance, not properly completing the contract, inordinate delays in completion or financial failure, etc.,

1.9 If before/after the placement of the Purchase Order it is found/noticed that the supplier has been black-listed/debarred then such supplier will be dropped from the tendering process as technically not suitable to quote or order will be cancelled. Thus, black-listed/debarred firms are requested not to participate in our tendering process.

1.10 Any additional bid participation criteria/eligibility conditions etc. mentioned in the Technical Specification sheet will also form and part of the Qualification Requirements along with those mentioned in this chapter.

SECTION-B: THE BIDDING DOCUMENTS

2. Cost of Bid Document

Tender document can be purchased from the Accounts Section of SAMEER-CEM located at CIT Campus, 2nd Cross Road, Taramani, Chennai - 600 113 between 10.00 AM and 5.00 PM, on cash payment of Rs. 2500/- (Rupees two thousand five hundred only) on all days except Saturdays, Sundays and public holidays. If the tender document is downloaded from our website <<http://cem.sameer.gov.in>>or <<https://eprocure.gov.in/cppp>>, then Tender fee should be paid along with Technical Bid (EMD & Tender Fee should be paid separately)

3. Contents of Bid Document

The goods required, bidding procedures and contract terms are prescribed in this bid document. The Bidder is expected to examine all instructions, forms, terms, conditions and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and shall result in rejection of the bid.

4. Amendment to Bid Document

4.1 At any time prior to the deadline for submission of bids, SAMEER-CEM may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the Bid Document by amendment. Such amendments shall form an integral part of bid documents and it shall amount to an amendment of relevant clauses of the Bid Document.

4.2 The prospective bidders are required to keep a watch on the SAMEER-CEM website <<http://cem.sameer.gov.in>> for any amendment to the tender document or clarifications to the queries raised by the bidders in till 01 (one) day prior to the opening of the tender. SAMEER-CEM reserves the right to reject the bids if the bids are submitted without taking into account these amendments/ clarifications. Further, bidders will be fully responsible for downloading the tender document and amendments thereto if, any for their completeness.

4.3 In order to allow prospective bidders to take reasonable time in which to effect the amendment into account in preparing their bids, SAMEER-CEM, at its discretion, may also extend the deadline for the submission of bids.

SECTION - C. PREPARATION OF BIDS

5. Language of Bid

The Bid prepared by the Bidders and all correspondence and documents relating to the bid exchanged by the bidder shall be written in English language only.

6. Documents Comprising the Bid

6.1 The bid is required to be submitted **in two Bid Format(Technical & Commercial bid)**. The bidders shall submit their bids in sealed covers (Tender No. & Due date must be compulsorily mentioned on the envelope containing the bid)

6.2 Detailed Specifications, Catalogues, List of users & Technical Details, Technical Compliance Sheet, Pre-Installation Requirements, payment terms, warranty terms etc., must be submitted along with technical bid.

6.3 Technical Bid shall include the following

- (i) EMD as specified in the invitation to bids
- (ii) MSME/NSC Certificate If,EMD waiver is claimed
- (iii) Tender fee as specified in the invitation to bids
- (iv) Service Support Details Form
- (v) Deviation Statement Form
- (vi) Technical Specification Compliance Statement Form
- (vii) Manufacturer's Authorization Letter
- (viii) Bidder's Performance Statement Form
- (ix) Equipment Data sheet/Technical specification
- (x) Tender document (Page No.3 to 16) duly signed by the bidder with company seal

7. Prices

7.1 The Bidder shall indicate the unit price and total price of the item it proposes to supply under the order and enclose it with the price bid. SAMEER-CEM is a Govt funded R&D centre. Please consider quoting special prices applicable to R&D institutions as per your company policies.

7.2 Full Prices in Foreign Currency or in Indian Rupees may be given in the bid for

- i. **3m** Ferrite tiled hybrid Shielded Anechoic Chamber with **1.2m** quiet zone -1no.
- ii. Shielded Control room - 1 no.
- iii. Shielded Amplifier room - 1 no.
- iv. Conducted Susceptibility Lab shielded room - 1 no.
- v. Associated Equipments

7.3 Prices indicated shall be entered separately in the following manner (*For Indigenous and Imported Items*):

- i. The price of the items shall be quoted on F.O.R (delivered at SAMEER-CEM, Chennai).
- ii. **Taxes: SAMEER-CEM** is registered with Department of Scientific Industrial Research (DSIR), for the purpose of availing custom duty exemption in terms of Government amendment to 24/2007-customs dated 1st March, 2007. {approx. 9.356 % duty is applicable under this notification (5 % Basic + 4 % SAD + cess) and central excise duty exemption in terms of Government Notification no. 10/97-central excise amended to 16/2007-central excise dated 1st March, 2007.
- iii. Please mention the applicable taxes (GST etc.) clearly. If quoted rates are inclusive of such taxes, pl. indicate the percentage (%) of such taxes to be charged by you.
- iv. We don't issue any 'Form C' or 'Form D'.
- v. If there is no explicit mention of taxes in offer, then quoted price will be *deemed inclusive* of such taxes. **No other charges except those mentioned clearly in the price bid will be paid.**
- vi. Packing, forwarding, documentation, freight and insurance charges and installation charges must be clearly mentioned separately. Vague terms like "packing, forwarding, transportation etc., would be extra" without mentioning the specific amount/percentage of these charges will NOT be accepted. Such offers shall be treated as incomplete and will be rejected.

8. Training

The supplier should provide detailed onsite training at SAMEER-CEM Chennai at free of cost, after installation and commissioning of the said chamber and shielded conducted susceptibility room at SAMEER-CEM. This training shall be to the satisfaction of SAMEER-CEM Scientists.

9. Installation

Installation, commissioning, performance testing and validation (*by the third party*) of RF Shielded Anechoic Chamber will be the sole responsibility of the Supplier / Indian Agent. Installation with all infrastructural works have to be done by the supplier. The bid must include pre-requisite for installation of the chamber and shielded conducted susceptibility room at SAMEER-CEM. Bidders shall also indicate in their offer the total expected time required for installation/commissioning and testing of chamber. However, the successful bidder shall arrange and complete the installation of the chamber within 60 days from the date of arrival of the chamber at SAMEER-CEM

10. Warranty

a) Bidders (OEM/ Agents) must submit offers with at least **10 (ten) years comprehensive and onsite warranty** after successful installation of the chamber in all respects at Site, i.e., SAMEER-CEM, Chennai (**which would be considered for the tender evaluation purpose**). During this warranty period ,if performance of chamber degrades due to deterioration of materials like absorbers, shielding panels etc., should be replaced at free of cost.

b) The successful installation date along with the date to be reckoned for start of the warranty period needs to be certified by the vendor & the user scientist after third party validation. **The warranty offered should be unconditional and the vendor should agree to replace or repair the at their cost. The spare parts for the repair during warranty period have to be provided by the vendor.**

c) Warranty of all other subsystems and accessories such as CCTV system, turntable, audio communication system, fire detection system, power line filters etc., will be for a period 3years.

d) All costs /expenses incurred towards repair/service during warranty period (like courier/Freight, Insurance, Customs etc) shall be reimbursed/borne by supplier / manufacturer to SAMEER. Alternatively, supplier / manufacturer shall take up the total responsibility of courier/Freight, Insurance, Customs etc. for repair/service during warranty period.

11. Validation of the chamber by third Party :

Tests and Validation shall be carried out by the third party nominated by the bidder. Test and validation shall be conducted by a reputed ISO/IEC 17025 accredited calibration/testing laboratory as per the standards mentioned in the technical bid (*clause No.20*). While appointing the third party validation Agency, the bidder shall pass instruction to the appointed third party validation Agency to comply and respond to the advice/queries made by SAMEER-CEM directly with the validation agency in connection with the validation. The third party agency must submit the inspection certificate in Original together with the Declaration Certificate (as per Format mentioned in Annexure-VI) to SAMEER-CEM.

12. Delivery Period:

a) In case of **foreign suppliers, the firm delivery period is 180 days after opening irrevocable Letter of Credit (LC) by sight**. No part shipment is permitted.

b) In case of **Indigenous suppliers, the firm delivery period is 180 days after issue of Purchase Order**. Delivery is to be made at SAMEER-CEM, Chennai. Delivery must be on FREIGHT PAID BASIS for despatch by Road.

c) The bidder must provide information regarding mode of shipment whether it is by **Air/Sea/Road/Rail**.

13. Bid Currencies

Prices shall be quoted in Indian Rupees (INR) or in freely convertible foreign currency preferably in USD (\$), Euro (€), Yen (¥), GBP (£) and SFr (CHF).

14. Documents Establishing Bidder's Eligibility and Qualifications

The bidder shall furnish, as part of its bid, documents establishing the bidder's eligibility to bid and their qualification to perform the contract if the bid is accepted.

15. Documents Establishing Goods' Eligibility and Conformity to Bid Document

15.1 The documentary evidence of the chamber eligibility shall consist of a statement on the **country of origin** of the goods and services offered which shall be confirmed by a **certificate of origin at the time of shipment**.

15.2 Specifications are basic essence of the product. It must be ensured that the offers are strictly as per our tendered specifications. At the same time, it must also be kept in mind that merely copying our specifications in their quotation shall not make firms eligible for consideration. The documentary evidence of conformity of the chamber to the Bid Document may be in the form of literature, drawings and data, and shall consist of:

- (i) A detailed description of the essential technical and performance characteristics of the 3 RF Shielded Anechoic Chamber and Shielded conducted susceptibility room
- (ii) A list giving full particulars, including available sources and current prices, of spare parts, special tools, etc., necessary for the proper and continuing functioning of the chamber for a period of 10 years, following commencement of the use of the goods by the Purchaser; and
- (iii) An item-by-item commentary on the SAMEER-CEM Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications.

16. Period of Validity of Bids

Bids must remain valid for at least **180 days** after the date of bid opening prescribed by **SAMEER-CEM**. A bid valid for a shorter period may be rejected by the Purchaser as non-responsive.

16.1 In exceptional circumstances, SAMEER-CEM may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing (fax or e-mail). The bid security shall also be suitably extended, if applicable.

17. Patent Right & IPR Laws:

The supplier shall indemnify SAMEER-CEM against all third-party claims of infringement of Patent, Trademark or Industrial Design Rights arising from the use of Goods or any part thereof in the Purchaser's country (INDIA). The vendor should be sure about his claim on the ownership of technology and total compensation in the event of a claim should be paid to the buyer in case of patent infringement.

18. Right to Information Act.2005

The bidder may indicate if any information in his tender includes information of commercial

confidence, trade secrets or intellectual property, the disclosure of which would harm the competitive position of their company.

19. Format of Bid

The tenders are invited on two bid systems i.e. the qualifying bid (technical bid including tender fee and EMD) and then the price bid:

19.1 The tender form for Technical bids shall be complete in all respects should be submitted in sealed cover superscripted – **“Technical Bid – Supply, Installation, Commissioning , Performance testing and Validation of RF Shielded Anechoic Chamber.**

19.2 The tender form for price bid shall be complete in all respects should be submitted in sealed cover superscribed – **“Price Bid –Supply, Installation, Commissioning , Performance testing and Validation of RF Shielded Anechoic Chamber”**

19.3 The above two sealed covers should be put together in another big cover/envelope which should be sealed with wax. The cover shall be superscribed as “Tender No:....., dated: & Name of Tender **“Supply, Installation, Commissioning , Performance Testing and Validation of RF Shielded Anechoic Chamber”** and addressed to

The Programme Director,
Society for Applied Microwave Electronics Engineering and
Research(SAMEER) -
Centre for Electromagnetics, CIT Campus, 2nd Cross Road, Taramani,
Chennai - 600 113, Tamil Nadu, India.

Further, the sentence “NOT TO BE OPENED” before due date and time of tender opening, should also to be indicated on this envelope. If the outer big envelope is not sealed and marked properly as above, SAMEER will not take any responsibility for its misplacement, premature opening etc. The bid document shall be submitted in the above mentioned address latest **by 14.00 hrs. on 29.11.2019**

20. The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to bind the Bidder to the Contract. All pages of the bid, except for un-amended printed literature, shall be initialled /endorsed by the person or persons signing the bid.

20.1 Any interlineations, erasures or overwriting shall be valid only if the person or persons signing the bid initial them.

20.2 The Bidder shall furnish information on commissions or gratuities, if any paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract as per the bid form.

SECTION - D. SUBMISSION OF BIDS

21. BID SECURITY (EARNEST MONEY DEPOSIT):

21.1 The bidders shall furnish as part of the bid, a Bid Security (EMD) for an amount of Rs.20,00,000/- (Rupees twenty lakhs only) in the form of Demand Draft/ Banker Cheque from any nationalized Bank in favour of **“SAMEER - Centre for Electromagnetics” payable at Chennai.** The EMD will bear no interest whatsoever. The EMD & Tender fee should be enclosed with the Technical Bid.

21.2 The bid security is to protect SAMEER against the risk of bidder's conduct, which warrant the bid security's forfeiture.

21.3 In case the Bidder claims for waiver of EMD, the bidder shall provide documentary proof of being registered with the National Small Industries Corporation (NSIC)/MSME or the concerned Ministry or Department as per Rule 170 (i) of GFR 2017 of Government of India. The registration must remain valid till the Bid Validity period.

21.4 Bids without Earnest Money or documentary evidence for waiver of the same as indicated above shall be summarily rejected as non-responsive.

21.5 Unsuccessful bidder's EMD will be returned within 30 days from the date of placement of order to the successful bidder.

21.6 The EMD of successful bidder will be retained as Retention Money and the same will be returned after submitting the Bank guarantee.

21.7 No interest is payable on the EMD.

21.8 The bid security(EMD) may be forfeited:

- (a) If a bidder withdraws his bid during the period of bid validity or makes modifications to his tender which are not acceptable to SAMEER-CEM
- (b) If the bidder fails to sign the contract and does not furnish the performance security.
- (c) Failure to full fill the contract terms & conditions

21.9 Fax or e-mail bids will be rejected.

22. Deadline for Submission of Bids

22.1 Bids must be received at SAMEER-CEM in the address specified not later than the time and date specified in the NIT. In the event of the specified date for the submission of Bids being declared a holiday for SAMEER-CEM, the Bids will be received up to the appointed time on the next working day.

22.2 SAMEER-CEM may, at its discretion, extend this deadline for submission of bids by amending the bid documents.

23. Late Bids

Any bid received after the deadline for submission of bids prescribed by SAMEER-CEM, will be rejected and/or returned to the Bidder.

24. Modifications and Withdrawal of Bids

The Bidder may modify or withdraw its bid after the submission of bid provided that written notice of the modification or withdrawal is received by SAMEER-CEM prior to the deadline prescribed for submission of bids.

24.1 No bid may be modified subsequent to the deadline for submission of bids.

24.2 No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the bid form. Withdrawal of a bid during this interval may result in the Bidder's forfeiture of its bid security

SECTION- E: OPENING AND EVALUATION OF BIDS

25. Opening of Bids

25.1 SAMEER-CEM through its "TENDER OPENING COMMITTEE (TOC)" will open bid in the

presence of Bidders/representatives who choose to attend, as per the schedule given in invitation to bids.

25.2 Bidders interested in participating in the bid opening process, should depute their representatives along with an authorization letter to be submitted to SAMEER-CEM (Tender Opening Committee) at the time of bid opening as mentioned in the NIT.

25.3 The Bidders' representatives who are present shall sign the bid opening attendance sheet evidencing their attendance. In the event of the specified date of Bid opening being declared a holiday for SAMEER-CEM, the Bids shall be opened at the appointed time and location on the next working day.

25.4 The bidder's names, bid modifications or withdrawals, specifications, and the presence or absence of requisite bid security and such other details, TOC at its discretion, may consider appropriate, will be announced at the bid opening meeting.

26. Bids that are received late shall not be considered for further evaluation, irrespective of the circumstances.

26.1 If any correction in the price quoted in the tender in words and/or figures shall be encircled in red ink by the bidders/representative and signed. The members of the tender opening committee shall endorse this.

27. Clarification of Bids

27.1 To assist in the examination, evaluation and comparison of bids, the Purchaser may, at its discretion ask the bidder for any clarification(s) of its bid/offer. The request for clarification and the response shall be in writing and no change in the prices or substance of the bid shall be sought, offered or permitted. **However, no post Bid clarifications at the initiative of the Bidder shall be entertained/considered.**

27.2 Any clarification and confirmation from the vendor after opening of the bid should not result in modification of their original offer in order to suit or meet the tendered specifications which would not be considered and accepted. Technical evaluation will be done strictly as per the details mentioned by the vendor in original offer with respect to the tendered specifications of SAMEER-CEM.

27.3 Any item not quoted in their original offer will not be accepted even though the bidder is willing to provide the materials + the unmentioned items at the same cost.

27.4 Any confirmation/clarification/modification by the bidder against the letter from SAMEER-CEM for communicating them the technical points of rejection would not make the firm technically suitable and their offer will stand as technically rejected. **Technical evaluation will be done strictly as per original offer submitted by the vendor with respect to the tendered specifications of SAMEER-CEM.**

28. Preliminary Examination

28.1 The TOC will examine the bids to determine whether they are complete, whether required tender fee and EMD have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

28.2 The TOC shall examine the bids to confirm that all documents and technical documentation as requested have been provided, and to determine the completeness of each document submitted

- (a) All the tenders received will first be scrutinized to see whether the tenders meet the basic requirements as incorporated in the NIT. The tenders, which do not meet the basic requirements, are to be treated as unresponsive and ignored. The following are some of the

important points, for which a tender may be declared as unresponsive and to be ignored, during the initial scrutiny:

- (i) The Bid is unsigned.
- (ii) The Bidder is not eligible.
- (iii) Tender fee and EMD are not submitted.
- (iv) The Bid validity is shorter than the required period.
- (v) The Bidder has quoted for goods manufactured by a different firm without the required authorization letter from the manufacturer/OEM.
- (vi) Bidder has not agreed to give the required performance security.
- (vii) The goods quoted are sub-standard, not meeting the required specification etc.
- (viii) Against the schedule of Requirement (incorporated in the tender enquiry), the bidder has not quoted for the entire requirement as specified in that schedule.
- (ix) The bidder has not agreed to some essential condition(s) incorporated in the tender enquiry.

29. Prior to the detailed evaluation, the TOC will determine the substantial responsiveness of each bid to the bidding documents. For purposes of this clause, a substantive responsive bid is one, which conforms to all terms and condition of the bidding documents without material deviations, reservations or omissions. A material deviation, reservation or omission is one that:

- (a) affects in any substantial way the scope, quality or performance of the items and Related Services specified in the Contract; or
- (b) limits in any substantial way, inconsistent with the Bidding Documents, the Purchaser's rights or the Bidder's obligations under the Contract; or
- (c) If rectified, would unfairly affect the competitive position of other bidders presenting substantially responsive bids.

29.1 The TOC determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

29.2 If a bid is not substantially responsive, it will be rejected by the TOC and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation or omission.

30. Non-conformities between the figures and words of the quoted price

30.1 Any discrepancy between quoted prices in figures and that in words, if noted will be sorted out in the following manner:

(a) If there is a discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the TOC there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in

figures shall prevail subject to (a) and (b) above.

30.2 If there is such discrepancy in a bid, the same is to be conveyed to the bidder with target date on the above lines and if the bidder does not agree to the observation of the TOC, the tender is liable to be ignored and its Bid Security may be forfeited.

31. Non-conformity, Error and Omission

31.1 Provided that a Bid is substantially responsive, the TOC may waive any non-conformities or omissions in the Bid that do not constitute a material deviation.

31.2 Provided that a bid is substantially responsive, the TOC may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the bid related to documentation requirements. Such omission shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

32. Examination of terms & Conditions, technical Evaluation

32.1 The TOC shall examine the Bid to confirm that all terms and conditions specified in the tender document have been accepted by the Bidder without any material deviation or reservation including the terms & conditions mentioned.

32.2 Prior to the detailed evaluation, the TOC determine the *substantial responsiveness* of each bid to the Bid Document as mentioned. Deviations from or objections or reservations to critical provisions such as those concerning Bid Security/ Performance Security, Warranty, Taxes& Duties will be deemed to be a material deviation. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

32.3 TOC shall evaluate the technical aspects of the Bid submitted to confirm that all requirements specified in Schedule of Requirement of the Bidding Documents have been met without any material deviation or reservation.

32.4 If, after the examination of the terms and conditions and the technical evaluation with respect to the tendered technical specification of SAMEER-CEM, the Purchaser determines that the Bid is not substantially responsive in accordance with ITB, it shall reject the Bid.

32.5 SAMEER-CEM may waive any minor informality, non-conformity, or irregularity in a bid, which does not constitute a material deviation, provided such a waiver, does not prejudice or affect the relative ranking of any Bidder.

32.6 After downloading, the language of standard clauses etc. mentioned in this 'Bid Document' should not be tampered with/ changed/modified in any manner whatsoever. If any such modification etc. comes to our knowledge at any stage, the bid shall be rejected immediately and EMD shall also be forfeited.

33. Evaluation & Comparison of Bids.

33.1 Conversion to Single Currency: -To facilitate evaluation and comparison, the TOC will convert all bid prices expressed in the amounts in various currencies in which the bid prices are payable to Indian Rupees at the selling exchange rate established by the Reserve Bank of India <www.rbi.org> prevailing rate on the date of opening the Price bid.

33.2 For the bids surviving the technical evaluation which have been found to be substantially responsive shall be evaluated and compared.

33.3 To evaluate a Bid, the TOC shall only use all the factors, methodologies and criteria defined below. No other criteria or methodology shall be used.

34. PROCESS OF EVALUATION (BETWEEN INR QUOTE & FOREIGN CURRENCY QUOTE): -**(a) For goods manufactured in India: -**

1. The price of the item shall be quoted on the basis F.O.R destination (delivered at SAMEER-CEM), as specified in the bidding document.

(i) GST and other taxes like excise duty etc., which will be payable on the goods of the contract is awarded. SAMEER-CEM is not entitled for issuing C&D form.

(ii) All Charges involved for inland transportation, insurance, Road Permit if required for delivering the goods at the desired destination i.e., F.O.R, SAMEER-CEM, Chennai, Tamil Nadu.

(iii) The installation, training, accommodation and travel charges if any

(b) The goods manufactured in abroad: -

(i) The price of the items shall be quoted on the basis of CIP (Destination Port) as specified in the bidding document.

(ii) Installation & Training charges if any.

(iii) In case, where the foreign principal quotes and he does not have an agent in India then the foreign service engineer visits and AMC charges should be provided. The foreign service engineer's visit during installation would be added for the purpose of cost comparison and selection

35. PROCESS OF EVALUATION: (BETWEEN TWO OR MORE FOREIGN CURRENCY QUOTE):-

SAMEER-CEM shall evaluate the bids for deciding a technically suitable lowest quoting would be on CIP (Destination Port).

35.1 If the bidder quoted certain optional items, these items should not be taken into consideration for the evaluation of the bid unless the specifications of the optional item quoted by the bidder are part of original indented specification.

36. Contacting SAMEER-CEM

36.1 No bidder shall contact SAMEER-CEM or concerned scientist on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded. If the bidder wishes to bring additional information to the notice of SAMEER-CEM, it should do so in writing.

36.2 Any effort by a bidder to influence SAMEER-CEM in its decisions on bid evaluation, bid comparison or contract award may result in rejection of the Bidder's bid.

SECTION-F: PAYMENT TERMS**37. Payment Terms**

37.1 Payment for Indigenous supplier: 100% payment would be released after satisfactory installation as certified by the user Scientists, subject to submission of Performance Bank Guarantee (PBG) for 10% of the purchase order value, covering the period of Warranty+60days.

a) Successful bidder is requested to furnish the following details for making payment.

- (i) 11digit core banking Account Number.
- (ii) Type of Account (Saving/Current)

- (iii) Name of Account Holder
- (iv) Name of Bank & Branch
- (v) IFSC Code Number
- (vi) MICR Number

37.2 Payment for Foreign Suppliers:

70% (seventy percent) of the payment will be released by Irrevocable Foreign Letter of Credit (BY SIGHT) against the supply of items and related accessories. Balance 30% will be released after satisfactory installation, commissioning testing and validation of the chamber at site after adjusting liquidated damages, if any. The above payment is subject to submission of Performance Bank Guarantee (PBG) by the vendor for 10% of the purchase order value covering the period of warranty + 60 days within 21 days of placement of purchase order and before opening Irrevocable Letter of credit.

37.3 Commission for Indian Agent

Bidders must clearly indicate in their offer whether they have any Agent in India. If so, bidders must furnish the names and addresses of their agents and state clearly whether agents are authorised to receive any commission. The rate of commission amount must be indicated, which will be payable only in non-convertible Indian currency. Unless otherwise specified it will be assumed that Agency commission has been included in the offered price. If there is no mention about the commission amount, it will be assumed that no commission is involved against this purchase. Commission to Indian Agents shall be released only after successful installation & commissioning by the Bidder/Indian agent.

37.4 No outright advance payments will be made to the firms. Any advance will be against a bank guarantee of equivalent value.

(i) No extra charge will be paid by SAMEER-CEM,. Supplier shall take care for all transit risks for the safe delivery of the item.

(ii) The L/C will be confirmed at the suppliers cost, if requested specifically by the supplier. **All bank charges abroad shall be to the account of the beneficiary i.e. supplier and all bank charges in India shall be to the account of the opener i.e. purchaser.** If L/C is requested to be extended/ reinstated for reasons not attributable to the purchaser, the charges thereof would be to the suppliers' account. Payment of local currency portion shall be made in Indian Rupees within thirty (30) days of presentation of claim supported by a certificate from the Purchaser declaring that the Goods have been delivered and that all other contracted Services have been performed.

SECTION - G: PENALTY CLAUSE

38. Penalty clauses: -

38.1 Penalty (Liquidated Damages) @ **0.5%** of basic price per week will be deducted from Manufacturer's/ Indian Agent's Bill for delay in Delivery & Despatch beyond Delivery dates (as extended by SAMEER-CEM in Purchase Order and Letter of Credit Schedule). Maximum deduction for failing to deliver within SAMEER-CEM approved delivery period & extensions will be limited to **5%** of Ex-works Value (equivalent in Indian Rupees) for non-fulfilment of delivery deadlines and any other contractual obligations as per Purchase Order. Once the maximum is reached, SAMEER-CEM may consider termination of the Contract.

38.2 Delay in Installation beyond contractual deadline will result in forfeiture of EMD and Performance Bank Guarantee.

38.3 For any clarification, please mail at purchase.chn.sameer@nic.in

38.4 Corrigenda: Corrigenda, if any, to this tender will be published on our website <http://cem.sameer.gov.in>. The bidders are advised to check our website before submitting the bid.

38.5 PERFORMANCE GUARANTEE

The successful bidder has to give Performance Bank Guarantee (PBG) in the form of Demand Draft / Fixed Deposit Receipt from an Indian Nationalised bank / a counter Letter of Credit (LC) from our bankers (in case of foreign order), for 10 % of Order Value. Performance Bank Guarantee should remain valid for a period of sixty days beyond the warranty period.

38.6. SAMEER-CEM Clearing Agent in India for imported consignment

M/s.BalmerLawrie& Co Ltd.,
628, Anna Salai, Teynampet,
Chennai-600 018, Tamil Nadu, India
Phone 91-44- 24302463 - 24348104
E-mail: thiyagarajan.j@balmerlawrie.com , baskar.m@balmerlawrie.com
Mobile: 9940015440 / 9551324005

38.7 Delivery & Documents:

Details of Shipping and other Documents to be furnished by the Supplier are

(i) For Goods manufactured within India

Within 24 hours of dispatch, the supplier shall notify SAMEER-CEM the complete details of dispatch and also supply following documents by registered post / speed post and copies thereof by FAX or e-mail.

(ii) For Goods manufactured abroad

- i) Supplier's original invoice giving full details of the goods including quantity, value, and so on;
- ii) Packing list;
- iii) Certificate of country of origin of the goods to be given by the seller or a recognized chamber of commerce or another agency designated by the local Government for this purpose;
- iv) Certificate of pre-dispatch inspection by the purchaser's representative; if applicable
- v) Manufacturer's test certificate and guarantee;
- vi) Certificate of insurance;
- vii) Bill of lading/airway bill/rail receipt or any other dispatch document, issued by a Government agency (like the Department of Posts) or an agency duly authorized by the concerned Ministry/Department, indicating:
 - a) Name of the vessel/carrier;
 - b) Bill of lading/airway bill;
 - c) Port of loading;
 - d) Date of shipment;
 - e) Port of discharge and expected date of arrival of goods; and
 Any other document(s) as and if required in terms of the contract.

Note:

1. The nomenclature used for the item description in the invoices(s), packing list(s) and the delivery note(s) etc. should be identical to that used in the contract. The dispatch particulars including the name of the transporter should also be mentioned in the Invoice(s)

2. The above documents should be received by the Purchaser before arrival of the Goods and, if not received, the Supplier will be responsible for any consequent expenses

38.8 Insurance:

(i) The goods supplied under the contract, shall be fully insured in a freely convertible currency against loss or damage. Insurance liabilities will be as per the basis of delivery point/INCOTERMS in case of imported items, the supplier shall arrange and pay for air/marine insurance making, SAMEER-CEM as beneficiary.

38.9 Pre-bid meeting

To provide a level playing field, pre-bid meeting will be held at the address mentioned in the tender schedule for clarifying issues/clearing doubts, if any, about the specifications and other allied technical/commercial details of the chamber and its related accessories projected in the bidding document. The date, time and place of the pre-bid meeting are indicated in the tender schedule. Bidders are requested to submit written queries in advance of the meeting either through e-mail <ramamoorthi.sameer@nic.in, purchase.chn.sameer@nic.in> or registered speed post to the address mentioned above. After the meeting, the techno-commercial requirements may be revised if, considered necessary by way of a formal corrigendum and shared with all the prospective bidders.

COVER-I

TECHNICAL SPECIFICATIONS (FOR 3M EMC CHAMBER)

1. Scope:

The vendor shall execute the task as a **turnkey project** for **supply, install, commission, performance testing & validation** of following Shielded Anechoic Chamber and Associated shielded auxiliary/Laboratory rooms within SAMEER Centre for Electromagnetics at Chennai, Tamilnadu to carry out EMI/EMC tests for various electronic equipment/systems:

- **3m** Ferrite tiled hybrid Shielded Anechoic Chamber with **1.2m** quiet zone -1no.
- Shielded Control room - 1 no.
- Shielded Amplifier room - 1 no.
- Conducted Susceptibility Lab shielded room - 1 no.
- Associated Equipments

Note: *The successful vendor need to coordinate with other sub-systems vendors (viz. Air conditioning, Electrical, instrumentation and Civil) while integration of the Chamber.*

2. Technical and General Requirements for 3m shielded Anechoic Chamber:

Sr. No	System Requirement	Description
1.	Dimensions of Chamber	<p>3m Ferrite tiled hybrid shielded Anechoic Chamber: External shield to shield dimension of Anechoic Chamber LxWxH [m]: 8 x 6 x 4.5 (±5%)-rectangular or square design</p> <p>Shielded Control Room: External shield to shield dimension of Control Room LxWxH [m]: 5 x 2.5 x 3(±5%)</p> <p>Shielded Amplifier Room: External shield to shield dimension of Amplifier Room LxWxH [m] : 5 x 2.5 x 3(±5%)</p> <p>Conducted susceptibility lab shielded room External shield to shield dimension of shielded Room LxWxH [m] : 6.5 x 6 x 3(±5%)</p>
2.		3m Ferrite Tiled Hybrid Shielded Anechoic Chamber
2.1	Purpose of use and Applicable Standards	<p>To perform full compliance EMI and EMS measurements according to the most commonly used international standards.</p> <p>EMI Measurements: To conduct Radiated & Conducted</p>

		<p>Emission measurements according to the following standards:</p> <p>MIL -STD-461 F/G: Full compliance at 1m measurement distance in the frequency range from 10 kHz to 40 GHz.</p> <p>EMS Measurement:</p> <p>To conduct Radiated & Conducted Immunity tests according to the following Standards:</p> <p>MIL -STD-461 F/G: Full compliance at 1m test distance in the frequency range from 2 MHz to 40 GHz.</p> <p>EN/IEC 61000-4-3 2006: Full compliance at 3m test distance in the frequency range from 80 MHz to 6.0GHz.</p> <p>AUTOMOTIVE EMI/EMS MEASUREMENT:</p> <p>CISPR 25,ISO 11452,2014/30/EC: Automotive testing (component level)</p>
2.2	Applicable standards for chamber evaluation	IEEE299, EN 50147-1, ANSI C 63.4, CISPR 16-1-4 Ed.3, EN /IEC 61000-4-3, CISPR 25
2.3	Test Distance from EUT	<ul style="list-style-type: none"> 7cm and 1.0 m as per MIL-STD-461 F/G, 1m as per CISPR 25 and 3m as per IEC 61000-4-3.
3.	Technical Specification of EM Shielding in Anechoic Chamber	
3.1	Structural Framework	<ul style="list-style-type: none"> The shielded chambers should be modular and self-supporting (independent from host building). The whole system shall be supported by free standing steel structural frame and conforms to the Uniform Building Code (UBC) and internationally accepted Institute of Steel Construction (SIC) standards. The entire chamber can be easily dismantled and reinstalled without performance losses and most of the critical components like shielding panels, ferrite tiles, pyramidal absorbers, Turn Table, Antenna Mast, CCTV and other accessories should be reusable. Prior to chamber design and installation, vendor should measure the actual dimension of the building, irrespective of the dimensions provided in these specifications. Before installation, the vendor shall interact with SAMEER representatives, check and approve the place of the building hosting the chamber.
3.2	Electromagnetic Shielding Systems: (Modular PAN type)	<ul style="list-style-type: none"> The quality of shielding integrity is to be maintained in such a way that it does not degrade in joints and seams. No patchwork is permissible to achieve the specified shielding effectiveness. RF shielding is to be provided with high grade hot

		<p>rolled galvanized steel sheet of thickness ≥ 2.0 mm for the floor, walls and ceiling. This should meet the EN10142 standard, Quality as per DX51D+Z or any equivalent international standard. Corrosion protection Zinc layer of suitable thickness is to be provided. Thickness of galvanization should be min. $275\text{g}/\text{m}^2$ by chemical passivation according to DIN/EN 10143 standards. Hot zinc spray is to be applied on to the corners after welding/ grinding.</p> <ul style="list-style-type: none"> The PAN folds should be made inside the chamber so that smooth finish is available at the outside. 																								
3.3	Floor inside the Chambers	<ul style="list-style-type: none"> The floor of the chamber preferably built as elevated raised floor(300mm to 400mm high) with a perfect ground plane in line with all the doors threshold and the turntable surface. This floor should accept 2 Tons/sqm loads on an area defined as the heavy load area from entry door to turn table. The remaining area should be capable to handle 1 ton/sqm. The ground plane on top should be at least 2mm hot galvanized steel. The raised floor will have all cables running below the ground plane in dedicated electrical ducts from Wall penetration panels till floor connection panels. The whole system remains dismountable and modifiable for future requests. 																								
3.4	Shielding Effectiveness Performance	<p>The shielded anechoic chamber shall be tested in accordance with IEEE-299/EN 50147-1 standard. The shielded anechoic chamber should meet the following levels of shielding effectiveness.</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Field</th> <th>Attenuation</th> </tr> </thead> <tbody> <tr> <td>10 kHz to 100 kHz</td> <td>Magnetic</td> <td>$\geq 60\text{dB}$</td> </tr> <tr> <td>200 kHz to 1 MHz</td> <td>Magnetic</td> <td>$\geq 100\text{dB}$</td> </tr> <tr> <td>14 kHz to 400 MHz</td> <td>Electric</td> <td>$\geq 120\text{dB}$</td> </tr> <tr> <td>400 MHz to 1 GHz</td> <td>Plane wave</td> <td>$\geq 110\text{dB}$</td> </tr> <tr> <td>1 GHz to 10 GHz</td> <td>Plane wave</td> <td>$\geq 110\text{dB}$</td> </tr> <tr> <td>10 GHz to 18 GHz</td> <td>Microwave</td> <td>$\geq 100\text{dB}$</td> </tr> <tr> <td>18 GHz to 40 GHz</td> <td>Microwave</td> <td>$\geq 100\text{dB}$</td> </tr> </tbody> </table> <p>Vendor should arrange testing and certification from reputed, experienced and ISO/IEC 17025 accredited laboratory. The performance of the chamber should not be affected by corrosion, oxidation and mechanical expansion.</p>	Frequency	Field	Attenuation	10 kHz to 100 kHz	Magnetic	$\geq 60\text{dB}$	200 kHz to 1 MHz	Magnetic	$\geq 100\text{dB}$	14 kHz to 400 MHz	Electric	$\geq 120\text{dB}$	400 MHz to 1 GHz	Plane wave	$\geq 110\text{dB}$	1 GHz to 10 GHz	Plane wave	$\geq 110\text{dB}$	10 GHz to 18 GHz	Microwave	$\geq 100\text{dB}$	18 GHz to 40 GHz	Microwave	$\geq 100\text{dB}$
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3.5	Technical Specification of Floor and Ground plane Inside the Chamber and shielded rooms	<ul style="list-style-type: none"> The chamber has to be installed above a PVC membrane in order to avoid any humidity problem. The chamber should accept flatness tolerances of $\pm 3\text{mm}$ on a length of 3m. The electrical grounding connection of the ground plane into the chamber should be made at the whole 																								

		<p>peripheral.</p> <ul style="list-style-type: none"> • Inside the shielded rooms (control room and amplifier room), an elevated floor made of removable antistatic plates, adjustable and protected against ESD has to be provided. The floor inside the shielded rooms shall be capable of handling load of 1000 kg/m². The plates of size 600×600 mm (preferable) are easily removable for any modifications or service.
3.6	Grounding for EM Shielded Anechoic Chamber, EM Shielded Control & Amplifier room	<ul style="list-style-type: none"> • The EMC Chamber and the steel construction supporting the chamber must be isolated from ground,(single point grounding) by using appropriate electrical isolation sheet (dielectric) underneath and the connection of all the air ducts to the honeycombs should be made using canvas cloth. • Each filter box should be also grounded independently to the shielded enclosure.
4	Technical details of Microwave absorbers of Shielded Anechoic Chamber	
4.1	Shielded Anechoic Chamber's Hybrid Microwave Absorbers	<ul style="list-style-type: none"> • The anechoic chamber shall be fully lined with a combination of ferrite tiles and microwave absorbers on all sides to cover the frequency range from 2MHz to 40 GHz. • The four walls and ceiling of the chamber including the doors shall be covered fully with the hybrid microwave absorbers (absorbers fixed over ferrite tiles) to meet MIL-STD 461F/G applications and commercial standard requirements. • The absorbers shall be tested/calibrated and certificate shall be submitted.
4.2	Applicable Standards for microwave absorbers	<ul style="list-style-type: none"> • Performance of hybrid microwave absorbers should meet MIL-STD461F/G applications as well as commercial EMS standards (EN/IEC61000-4-3) must be fulfilled.
4.3	Technical Specifications of Microwave Absorbers	<ul style="list-style-type: none"> • The hybrid Microwave Absorber should provide high performance over the whole frequency range 30MHz - 40 GHz. • The microwave absorbers need to be light weight Pyramidal shaped. They shall not droop or change their physical and electrical characteristics with time or as a result of ambient environment. • The absorbers should not generate any additional dust in the chamber. It should meet with a minimum of ISO clean room class 4 or better. • The vendor should supply the absorbers from the manufacturer having minimum 10 years of experience. • Specifications: • Frequency Range: 30 MHz - 40 GHz

- Guaranteed Product Life: More than 15 years
- Max . service temperature: 90 °C

All Pyramidal absorbers shall be treated/ designed for longer life time, excellent shape retention.

- Guaranteed Reflectivity of absorbers at Normal Wave Incidence should be better than the values given in the following table.

Frequency	Reflectivity (dB)
30 MHz	-17
200 MHz	-20
300 MHz	-20
500 MHz	-20
1 GHz to 40 GHz	-25

- Vendor should provide authenticated certificate for Reflectivity performance of microwave absorber. Performance test report of absorbers for reflectivity measurement shall be enclosed with technical bid.

Factory Acceptance Test at the vendor site has to be provided for the verification of the performance of the absorbers.

- Vendor should provide necessary **assurance certificate** for guaranteed reflectivity performance for more than 15 years.
- **Power handling capability:** The absorbers shall be able to withstand more than 800W/m² (CW signal). Absorbers must withstand 200V/m field strength (CW signal) and intermittent field intensity (Radar pulses) of 500 V/m. Test reports shall be enclosed.
- **Fire Retardant:** Compliant with fire retardant standards **DIN 4102 B2** evaluation according to the report NRL 8093 test levels 1, 2, 3 and reports to be submitted. The fire retardant test report shall not be older than 5 years .
- SAMEER name and logo is to be Printed (on white caps). The size of logo should be at least 3x1.5m LxW
- **Furnishing:** White caps must be provided on the ceiling and wall absorbers to *enhance illumination and aesthetics of anechoic chamber.*
- The absorbers should be tested as per the test methods and equipment requirement specified in IEEE-STD-1128 and **all test reports** are to be in the absorbers shipment. Test lab used for the test of absorbers should be described.

		<ul style="list-style-type: none"> • Moveable Floor Absorber: Supplier has to specify the size and type in order to be fully compliant to the required EMC standards IEC/EN 61000-4-3, Ed.3 and CISPR 16-1-4, Ed.3. and supply the same. <p>Necessary arrangement for movement and storage of absorbers inside chamber shall be provided.</p>
5.	Technical Specifications of EM Shielded Door in Anechoic Chamber, Shielded Control Room and Amplifier Room	
5.1	Double leaf swing door of Anechoic Chamber	<p>Purpose: Movement of EUT.</p> <p>Type: Pneumatically operated Double leaf swing Door fitted with absorbers.</p> <p>Dimension: 1700mmx 2500mm(WxH)\pm50mm tolerance</p> <p>Door Type: Double knife edge shielded door fitted with ferrites and absorbers.</p> <p>LOCK: provision for locking the door shall be provided.</p> <p>Ramp: Suitable ramp shall be provided.</p> <p>Door Features:</p> <p>Micro switch indicating RF-tight open/close status of the door. Inter lock switch for automatic power cutoff of RF power amplifier while door is open. Necessary signal filter should be supplied and installed in Amplifier Room. Outside of the door should be equipped with Electrical displays like "TEST IN PROGRESS",. A manual switch to operate Test in Progress lamp to be provided near door.</p> <p>Door shall be provided with door stopper for holding the Door in open position. Necessary air compressor (with at least 50 litre air tank) to be provided for door operation.</p> <ul style="list-style-type: none"> • Shielding Effectiveness: <p>The doors shall have same shielding effectiveness of the emc chamber as specified above. The door frames should be fitted with Beryllium Copper finger springs to achieve Shielding effectiveness. It should be possible to make maintenance easily using simple spanner tool.</p> <ul style="list-style-type: none"> • Door maintenance kit - 2 no for each Door shall be provided.
5.2	Doors between Anechoic chamber & Control room	<ul style="list-style-type: none"> • Purpose: Required for personnel and Small EUTs movement between the shielded control room and the shielded anechoic chamber. • Door Dimension (WxH): 900 mm x 2100 mm • Door Type: single door of Double Knife Edge shielded door fitted ferrites and absorbers. • Motion: Manual swing door, Manual opening facility from inside and outside the chamber for

		<p>emergency exit should be possible.</p> <ul style="list-style-type: none"> • Door Features: The door leaf shall be fitted with the groove with BeCu finger springs on the door frame to ensure Shielding effectiveness. • The doors should be sized for supporting the absorbers and guaranteed at least 20000 MTBF. • Safety Features: A “Door Open” lamp integrated with Micro switch for automatic cut off of RF power amplifier to be provided. Necessary filter and hardware to be provided and installed. Integration with control software will be responsibility of equipment test system supplier. • Shielding Effectiveness: Same shielding effectiveness of the chamber as specified above. • Door maintenance kit - 2 no for each Door shall be provided.
5.3	Door for Control room	<ul style="list-style-type: none"> • Purpose: Required for personnel entry from outside into the shielded control room • Door Dimension (WxH):1200 mm x 2100 m • Door Type: Single door of Double Knife Edge shielded door with manual swing motion. Opening outside of the room. Manual opening facility from inside the room for emergency exit. • Door Features: Bronze double knife edge extrusion shall be mounted on the door leaf and receiver housing shall be mounted on the door frame. • Micro switch for door status indication shall be provided. Door can be integrated with fire detection system. • Ramp: Suitable ramp shall be provided. • Lock: Provision for lock shall be provided. • Shielding Effectiveness: Same shielding effectiveness of the chamber as specified above. • Door should of rugged construction, suitable for everyday use. • Door maintenance kit - 2 no for each Door shall be provided.
5.4	Door for Amplifier room	<ul style="list-style-type: none"> • Purpose: Required for personnel entry into amplifier room. • Door Dimension (WxH):1200 mm x 2100 mm • Door Type: Double Knife Edge shielded door/ Single leaf door, and manual swing motion. Opening outside of the amplifier room. Manual

		<p>opening facility from inside the amplifier room for emergency exit.</p> <ul style="list-style-type: none"> • Door Features: Single door of double knife edge extrusion shall be mounted on the door leaf and receiver housing shall be mounted on the door frame. • Micro switch for door status indication shall be provided. Door can be integrated with fire detection system. • Provision for locking the door shall be provided. • Ramp: Suitable ramp shall be provided. • LOCK: provision for lock shall be provided. • Shielding Effectiveness: Same shielding effectiveness of the chamber as specified above. • Door should of rugged construction, suitable for everyday use. • Door maintenance kit - 2 no for each Door shall be provided.
5.5	Door for CS Lab Shielded Room	<p>Purpose: Movement of EUT.</p> <p>Type: Double leaf swing Door.</p> <p>Dimension: 1700mmx 2500mm(WxH)\pm50mm tolerance</p> <p>Door Type: Double knife edge shielded door.</p> <p>Door Features:</p> <p>Door shall be provided with door stopper for holding the door in open position. Manual opening facility from inside the Shielded room for emergency exit.</p> <ul style="list-style-type: none"> • Ramp: Suitable ramps shall be provided. • Lock: Provision for lock shall be provided. • Shielding Effectiveness: The doors shall have same shielding effectiveness of the EMC chamber as specified above. The door frames should be fitted with Beryllium Copper finger springs to achieve Shielding effectiveness. It should be possible to make maintenance easily using simple spanner tool. <ul style="list-style-type: none"> • Door should of rugged construction, suitable for everyday use. • Door maintenance kit - 2 no for each Door shall be provided.
6.	Honeycomb Waveguide Air Vents for HVAC (Heating, Ventilation and Air Conditioning) System:	

6.1	Temperature & Humidity inside the Chamber	Honeycomb windows and AC VENTS shall be provided such that the temperature and humidity inside the chamber is maintained according to the values given below. Temp : 25°±3°C Humidity: ≤70%
6.2	Air conditioning and cleanliness requirements	To meet the air conditioning and cleanliness requirements, provision shall be made for AIR CONDITIONING (AC) taking into account the volume of the main chamber, control room, amplifier room, and also the heat load from EUT.
6.3	Ventilation and Pressure compensation	<ul style="list-style-type: none"> • Honeycomb inserts could be used for providing ventilation as well as for pressure compensation. The honeycomb design should combine the highest shielding effectiveness with the lowest resistance to airflow. The honeycomb inserts are to be equipped with a mounting flange to connect with AC ducts. Air supply and exhaust return is to be done through honeycomb air vent panels fitted to the openings on the shielded wall or ceiling. Honeycomb vents should be made of brass or steel core material with suitable Tin coating for superior RF performance and corrosion resistance. • The honeycombs should provide the same or better shielding effectiveness mentioned for the chamber. Test report shall be provided for the shielding effectiveness of the honeycombs. • The honeycombs must be of removable type for cleaning purpose. • Connection / interface of the AC ducts to these honeycomb air vents should be done through dielectric spacing collar to provide electrical isolation and a full protection against vibration which could be transmitted by the AC unit. • Appropriate arrangement for fixing the absorbers around the honeycomb air vents has to be realized to ensure requisite passage of air. Supplier has to work out the location of air conditioning ducts inside the chamber as well as control room and amplifier room to maintain the inside temperature.
6.4	AC Vents	<ul style="list-style-type: none"> • The presence of AC vents should not degrade the shielding Effectiveness performance of the chamber. • Vendor should provide the following information in technical bid : Type, quantity, locations and dimension of honeycomb air vents. The chamber air current, air speed at honeycomb & pressure drop at honeycomb shall also be provided. • Vendor should coordinate with AC installation

		vendor.
7	Shielding Access Panel(AP)	
7.1	Purpose	All coaxial RF cables, electrical power / data / control signals and fiber optics will enter the shielded chambers through access panels ensuring complete interconnectivity and high shielding effectiveness performance.
7.2	Features	<p>The Access Panels shall be of modular bolted system for easy replacement or up gradation. Each Access Panel shall be equipped with RF connectors / Fiber Optic connectors. All connectors should be of precision type.</p> <ul style="list-style-type: none"> • Wall penetration panels should be designed taking into account of the bending radius of cables entering into chamber to avoid breakages. • Wall penetration panels should be easily removable. • Connection Panels should be integrated inside the raised floor of the chamber. • All Cable ducts should be located under the raised floor. • Separate steel or PVC ducts to be provided for high voltage and low voltage cables with cover and should be grounded to avoid coupling effects. • Separate Power duct and direct Coax duct from filters to wall penetration panel and connection panel to be provided.
7.3	Access panels between Anechoic chamber and control room:	<p>1. RF Access panels : 1 Number.</p> <p>List of connectors(of precision type) on each panel:</p> <ul style="list-style-type: none"> • BNC (f), 50 Ohm2 Nos • N (f) TYPE, 50 Ohm..... 4 Nos • K-type connector.....2nos. • Waveguide pipeline, 5 cm diameter..... 2 Nos • Waveguide pipeline, 2.5 cm diameter..... 2 Nos • Fiber optic cable connector..... 6 holes <p>2. Empty RF Access panel for future requirements.....1 No.</p> <p>3. Access panel for Audio, Video & other equipment connections..... 1 No.</p> <p>4. Provision for digital system Camera output connector 4 Nos.</p> <p>5. Audio Communication Set full duplex and high power between the Control Room and the chamber, and shielded intercom system between the Control Room, Amplifier Room and outside to the lab.....2 Nos</p>

		<p>6. Provision for one EMI field probe connection : 1 No</p> <p>7. Feed through 2 multi optic fiber waveguides for 2 x 6 fibers.....2 filters for signal lines (2 lines each)</p> <p>1 Shielded optic converter system for CAN signals</p> <p>1 Shielded optic converter system for LAN 1Gbps</p> <p>1 Shielded optic converter system for RS-232 high speed. The shielded optic converters shall be delivered with built-in battery for flexible setup in the SAC.</p> <p>8. Access panel for various Control signals..... 1 No.</p>
7.4	Access panels between Control room & Amplifier room:	<p>1. RF Access panel 1 No.</p> <p>List of connectors (precision type):</p> <ul style="list-style-type: none"> • BNC (f), 50 Ohm 2 No's • N (f) TYPE, 50 Ohm..... 6 No's • TNC, 50 ohm..... 2 No's • SMA (f), 50 Ohm..... 2 No's • Waveguide connector (Hole diameter 2.5 cm)..... 1No. with caps <p>2. Viewing panel 1 No.</p> <p>3. Empty RF Access panel for future requirements..... 1 No.</p> <p>4. Access panel for various Control signals..... 1 No i.e. GPIB / IEEE 488, LAN, RS-232 etc. (through waveguide pipe penetration)</p> <p>5. Filters for signal lines 2 No's (2 lines each)</p> <p>1 shielded optic converter system for GPIB / IEEE 488, 1 shielded optic converter system for LAN 1Gbps, 1 shielded optic converter system for RS-232 high speed.</p>
7.5	Access panels between Amplifier room and Main chamber	<p>1. RF Access panel (Size: 18 inch x 18 inch) 1 No.</p> <p>List of connectors (precision):</p> <ul style="list-style-type: none"> • BNC (f), 50 Ohm 2 Nos. • N (f) TYPE, 50 Ohm..... 6 Nos • TNC, 50 ohm..... 2 Nos • SMA (f), 50 Ohm..... 2 Nos • 7/16 connector 2 Nos. <p>2. Empty RF Access panel for future requirements... 1 No.</p>

7.6	Access Panel Requirements	<ol style="list-style-type: none"> 1. To provide required quantity with suitable size panels As specified by the equipment supplier at a later stage. 2. To provide different types of connectors on shielding panels as per the requirements of equipment supplier to make interconnections between Controllers, antennas, amplifiers and Test Equipment at later stage during installation of test equipment's. 3. Proposed access panels should be flexible for future up gradation with new connectors. 4. All the cables and connectors must have low loss performance and procured from reputed companies. 5. RFI trap shall be provided for entry of cables into the EMC Chamber.
7.7	Access Hatches (Floor Connection Panel)	<ol style="list-style-type: none"> 3. The floor connection panels shall offer an opening size of 450 x 450 mm and integrate all connectors from the wall penetration panels, as well as all the sockets from the electrical distribution box. The cover plate of Connection panel shall be grounded. No. of connection panels and locations : 04 Nos. <ol style="list-style-type: none"> 1. At 3m distance from TT periphery. 2. At 1m distance from TT periphery. 3. Near MIL Test Bench 4. Near TURN TABLE.
8.	Electrical Installation	<ol style="list-style-type: none"> a). The chamber is to be fitted with a main switch board with appropriate protections (Circuit -breakers). This electrical distribution box should be installed inside/outside of the chamber for easy personal access . The board will be provided such that there is sufficient capacity for the present requirements and the future additions. b). The different networks are to be distributed on sockets with switches to power the EUT and Amplifier rack, Antenna mast, TT, CCTV, illumination system etc. c). The type of sockets, the quantities (to be supplied) and the locations are to be determined during final engineering process by mutual agreement. d). Emergency exit display signs to be provided inside chamber above door. e). Grounding bolts for connection to be available integrated inside the ground plane (at least 2 pieces made of brass bar threaded flush with the ground plane). f). Power outlets at different locations inside the chamber shall be provided according to the requirement.
9	Power Line Filter's configuration	

9.1	Features	<p>All the power lines entering the RF shielded Anechoic Chamber and the RF Shielded Control / Amplifier room should be adequately filtered and shall meet the specified shielding effectiveness of the facility.</p> <p>Real separated lines, single choke filters should be provided.</p> <ul style="list-style-type: none"> • RF sealed case made of stainless steel. • Wire mesh sealed access lid for cabling terminals. • “Single choke for each line” concept, to ensure full insertion loss performance also in case of unbalanced current flow.
9.2	Insertion Loss	<p>All PLFs shall have a performance of at least 100dB insertion loss at full load conditions from 14 kHz to 40 GHz in accordance with MIL- STD-220 A or CISPR 17. Sample test certificate to be submitted along with technical Bid.</p>
9.3	Filter rating for RF Shielded Anechoic Chamber	<ul style="list-style-type: none"> • 415V, 100 Amp/Phase, 50Hz, 3Ø, 4 line..... 2 Nos + 1No.spare shall be provided. • DC Power Supply 500V, 100Amp, 2 line.....1 No+ 1No.spare shall be provided. • 230V, 63 Amp, 50 Hz, 1Ø, 3 line..... 2 Nos +1No. spare shall be provided. • 115V, 32 Amp/Phase, 400Hz, 3Ø, 4 line..... 1 No.
9.4	Filter rating for Control Room	<ul style="list-style-type: none"> • 415V, 63 Amp/Phase, 50Hz, 3Ø, 4 line..... 1 No + 1No. spare shall be provided. • 230V, 32 Amp, 50Hz, 1Ø.....1 No+ 1No. spare shall be provided. • 115V, 32 Amp/Phase, 400Hz, 3Ø, 4 line..... 1 No+ 1No. spare shall be provided. • DC Power Supply 500V, 100Amp, 2 line.....1 No+ 1No. spare shall be provided.
9.5	Filter rating for Amplifier room	<ul style="list-style-type: none"> • 415V, 63 Amp/Phase, 50Hz, 3Ø, 4 line..... 1 No+ 1No. spare shall be provided. • 230V, 32Amp, 50Hz, 1Ø.....1 No+ 1No. spare shall be provided.
9.6	Filter rating for Conducted Susceptibility(CS) Lab Shielded room	<p>415V, 100 Amp/Phase, 50Hz, 3Ø, 4 line..... 2 Nos+ 1No. spare shall be provided.</p> <ul style="list-style-type: none"> • DC Power Supply 500V, 100Amp, 2 line.....1 No+ 1No. spare shall be provided. • 230V, 63 Amp, 50 Hz, 1Ø, 3 line..... 2 Nos+ 1No. spare

		<p>shall be provided.</p> <ul style="list-style-type: none"> • 115V, 32 Amp/Phase, 400Hz, 3Ø, 4 line..... 1 No+ 1No. spare shall be provided.
10	Signal Line Filter's Configuration	
10.1	Configuration	Any communication from outside to inside and vice-versa between chamber and control room must be realized through signal line filters.
10.2	Signal Line filters required	<p>Telephone & other audio communication signal filter, all digital signals, Filters for immunity interlock switches etc.</p> <ul style="list-style-type: none"> • Suitable signal filters for Anechoic Chamber, Control room and conducted susceptibility lab. • Anechoic Chamber: 4 line, Analog telephone filter.....1 no • Control Room: 4 line, Analog telephone filter..... 1 no • Conducted Susceptibility lab(CS Lab): 4 line, Analog telephone filter.....1 no • RF-tight case made of tin-plated sheet steel. • Internet (LAN), Analog/ ISDN telephone filters need to be provided for the control room.
11.	Illumination:	<ul style="list-style-type: none"> • LED high power EMI free lights should be installed within the main chamber, control room, amplifier room and conducted susceptibility lab must meet 300-500 LUX measured at 1m from the floor ground plane for the full area . The lights shall be warranted at least 10 years. The lights should be switched from outside the chamber at positions adjacent to both the main entrance Door / Personnel access door. • There should be a provision for the Emergency lamps to be powered by UPS located outside via Power line Filter. <p>Signal Lamps: <i>Location:</i> The signal lamps are fixed above the gate and doors. <i>Indication:</i> Test in Progress Lamp / outside of door. <i>Fire Alarm:</i> Fire Alarm Lamp / outside of door.</p>
12.	Turntable(TT)	
12.1	Configuration	The turntable shall be incorporated into the concrete slab or into the elevated raised floor, flush with the ground plane. Turn table should have specific grounding ring and matching wear strip to provide continuous electrical coupling with ground plane. A 0.3m diameter opening in the center of the turntable shall provide the power supply for testing.

		Remote control operation through GPIB/USB based controller. All I/O signals between the motor base and controller are through fiber optics lines. Turn table can also be set for continuous rotation or 400° max in order to avoid any problem with the cables connected to the EUT.																								
		<table border="1"> <tr> <td>Diameter</td> <td>2.0 m</td> </tr> <tr> <td>Load Capability (minimum)</td> <td>2000kg</td> </tr> <tr> <td>Material carrier plate</td> <td>Stainless steel</td> </tr> <tr> <td>Rotating speed adjustable between</td> <td>0.5 to 2 rpm</td> </tr> <tr> <td>Positioning accuracy</td> <td>Better than $\pm 0.1^\circ$ or as per the standard Requirement</td> </tr> <tr> <td>Rotating angle</td> <td>+400° or -200° to +200°</td> </tr> <tr> <td>Motor</td> <td>Asynchronous motor, frequency inverter brushless with high accuracy encoder</td> </tr> <tr> <td>Drive unit</td> <td>Shielded and radio interference suppressed. It shall be 20dB below CISPR 22 class B limits. Located outside of the turn disk in order to offer large space for cables to the EUT and easy access to the drive unit for maintenance.</td> </tr> <tr> <td>Control signals</td> <td>I/O signals through Fiber optic cable;</td> </tr> <tr> <td>Remote control via</td> <td>GPIB /USB interface <i>(The interface/drivers shall be compatible with most of the automation controllers & test instruments from different vendors)</i></td> </tr> <tr> <td>Voltage</td> <td>230VAC, 50Hz, single phase</td> </tr> <tr> <td>Accessories</td> <td> <ul style="list-style-type: none"> • Interface/ drivers to Controller • Power supply cable • Service manual. • Built in software </td> </tr> </table>	Diameter	2.0 m	Load Capability (minimum)	2000kg	Material carrier plate	Stainless steel	Rotating speed adjustable between	0.5 to 2 rpm	Positioning accuracy	Better than $\pm 0.1^\circ$ or as per the standard Requirement	Rotating angle	+400° or -200° to +200°	Motor	Asynchronous motor, frequency inverter brushless with high accuracy encoder	Drive unit	Shielded and radio interference suppressed. It shall be 20dB below CISPR 22 class B limits. Located outside of the turn disk in order to offer large space for cables to the EUT and easy access to the drive unit for maintenance.	Control signals	I/O signals through Fiber optic cable;	Remote control via	GPIB /USB interface <i>(The interface/drivers shall be compatible with most of the automation controllers & test instruments from different vendors)</i>	Voltage	230VAC, 50Hz, single phase	Accessories	<ul style="list-style-type: none"> • Interface/ drivers to Controller • Power supply cable • Service manual. • Built in software
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			for automation controls
13.	Antenna Mast	<p>1. The chamber shall be equipped with Automatic & remote controlled Antenna Mast.</p> <p>2. Antenna scan shall be possible from 1 to 4.0m height. Antenna height shall be settable at any height and the information shall be available in the display.</p> <p>3. Automatic polarization change shall be possible.</p> <p>4. The driver of the mast shall be upgradable and compatible with the Turntable and various test instruments.</p> <p>5. All the driving mechanism (motor, digital drive, electrical networks etc.) shall be installed in a <u>high performance shielded box</u> to suppress EMI generated by the electronics and also to protect this system against the fields generated in the chamber and shall meet the CISPR 22 Class B EMC standard.</p> <p>6. The antenna shall be linked to the GPIB controller through fiber optics.</p> <p>7. Antenna mounting adapters for most of the EMC antennas shall be provided. The EMC antenna manufacturer list is given below.</p> <ol style="list-style-type: none"> 1. AH Systems 2. ETS Lindgren 3. Rohde & Schwarz 4. Schwarzbeck 5. Frankonia 6. TESEQ , etc., <p>7. Antenna mast shall be Capable of handling weight of minimum of 12 kg .</p> <p>8. Accuracy: scan \pm 10mm</p> <p>9. AC input supply : 230V, 50Hz 1 phase.</p>	
14.	Video Monitoring Camera System	<p>High Resolution Digital (Full HD 1920 x 1080 pixels) Color. Video Camera System with in-built Audio Monitoring system for both audio & visual monitoring.</p> <p>Type: EMC hardened Digital System with Network Controller.</p>	
14.1	System requirement	<ol style="list-style-type: none"> 1. Digital System Camera, stationary unit, Qty. 2 No., mounting hardware for wall or ceiling mounting. 2. Digital System Camera, mobile unit, Qty. 2 No., mounting hardware / tripod. 3. Desktop computer with powerful graphics processor, 	

		<p>Qty. 1No.</p> <p>4. LED HD monitor min. 40 inch, Qty. 2 No.</p>
14.2	System Feature:	<ol style="list-style-type: none"> 1. Multiple accesses on a single camera. 2. Camera access from any location inside the network. 3. Direct MPEG4 video format recording and storage on hard disc by dedicated digital recorder. 4. JPG picture capturing. 5. Additional digital zoom feature. 6. Event recording
14.3	Camera Feature	<ol style="list-style-type: none"> 1. Remote controlled via PC / dedicated Controller, 20 x optical zoom lens integrated, optical image stabilization. 2. Additional 12x digital zoom. 3. Immunity ≥ 200 V/m up to 40 GHz (copy of laboratory test report to be submitted with technical BID) 4. EMC Compliant to CISPR 22 (class B) 5. full HD Color Resolution (1920x1080) 6. Control of Focus, tilt, Pan, Iris & Zoom (175° pan angle) by computer and software included. 7. Frames per sec : 30 max 8. Fiber optic or optical transmission 9. Should have built-in Micro phone 10. Should have built-in LED lighting 11. FSMA or wave guide penetration kit for all required connections to the controller, which includes the following: <ol style="list-style-type: none"> a) The camera system based on real time full HD is a complete solution autonomous having its own optical connections to the control room to monitor and digital recording. The digital recorder is also full HD compatible and accessible through the LAN connection via optic fiber converter. b) Each camera should include simplex audio equipment for listening to the device under test and also LED lighting integrating in order to have a better view on closer elements.
14.4	Specification of Display	<ol style="list-style-type: none"> 1. FULL HD LED monitor

	Screen	<p>2. Screen size min 40 inches</p> <p>3. Video monitoring display system must be compatible with the camera output.</p> <p>4. Picture in Picture (PIP) facility and splitting screen features.</p> <p>5. Necessary connectors for audio / video input.</p> <p>6. Audio Features (2 no. speakers integrated into the controller)</p>
15.	Intercom & Telephone Connection	<p>1. EMI hardened intercom between</p> <ol style="list-style-type: none"> Main chamber and control room. Main Chamber and amplifier room Control room and Amplifier room. Conducted Susceptibility lab and outside . <p>2. Telephone connectivity (Analog/ISDN) from control rooms.</p> <p>3. One number of signal line filters for each Phone line.</p>
16.	Specification of Audio communication system	<p>High sensitivity and powerful audio system perfectly shielded (EMI free and EMS 200V/m compliant) should be installed between the SAC 3 and the control room. This full duplex system is mobile and can be used for easy communication from the SAC to the Control Room and vice versa, as well as to monitor the sound from EUT under strong tests.</p> <p>Between the Control Room and Amplifier Room and the outside of the lab a shielded intercom system has to be supplied.</p>
17.	Fire Detection system	<ul style="list-style-type: none"> Fire detection, alarm system of VESDA (Very Early Smoke Detection Apparatus) technology or an equivalent should be incorporated in the anechoic chamber for the safety of the personnel and EUT. The detectors need to be placed at suitable locations. The information from these detectors is to be transmitted, processed and communicated to the control room FACP(Fire Alarm Control Panel) where decision regarding appropriate action is taken. As VESDA fire detection system is widely used for fire detection by air sampling method, the same should be provided. The fire/smoke/ion detection system must conform to US (MIL) and European standard. The fire detection system should conform to NFPA Standards-72. Also it needs ULFM approval. Control should be provided to switch

		off the mains to the chamber in case of fire/smoke detection by system.
17.1	Fire Detection system requirements	<ul style="list-style-type: none"> The system should consist of highly sensitive laser based smoke detector using aspirated air sampling and is connected to sampling pipes. It should be provided with a sample inlet, internal flow monitoring, smoke detection and a facility for exhaust pipe connection. Reset, disable and fault determination function shall be available via the field service.
17.2	Detector Assembly	<ol style="list-style-type: none"> The detector, filter, aspirator and relay output shall be housed in an enclosure and shall be arranged in such a way that air is drawn from the fire risk area and a sample of air is passed through the dual stage filter and detector by aspirator. The detector shall be laser type and shall have obscuration sensitivity range of 0.025-20% obs/m.
17.3	Displays	<p>The detector should be provided with LED indicators. Each detector should be provided with the following features at minimum:</p> <ul style="list-style-type: none"> Alert, Alarm, Fire1 and Fire2 corresponding to the alarm thresholds of the detector. Remote fire alarm configuration. Smoke dial display represents the level of smoke present. Fault indicator Power indicator Disabled indicator Buttons support the following features shall be accessible to authorized personnel: <ol style="list-style-type: none"> Reset - Unlatches all latched alarm and faults. Disable - Disables the fire relay outputs from actuating and indicates a fault.
17.4	Digital Communication Port	An RS232 compatible serial port should be provided on the detector for configuration, status monitoring, command input, event log extraction, and software upgrades. It should comply with EIA RS232 protocol.
17.5	Performance Requirements	<ul style="list-style-type: none"> System should be tested and approved to cover up to 100 m² in normal air flow. The detector should be approved to provide very early smoke detection and provide up to four output levels corresponding to Alert, Action, Fire 1 and Fire 2. Alert and action should be programmable and able to be set at sensitivities ranging from 0.025 to 20% obs/m. The detector should provide fault indication on the

		unit using the Instant Fault Finder function.
17.6	Quality Assurance	<ul style="list-style-type: none"> The fire detection system should be ISO 9001:2000 (or latest) certified.
17.7	Approvals	<p>The very Early Smoke Detection System must be of a type submitted to, tested, approved, and/or listed by minimum by two of agencies below:</p> <ul style="list-style-type: none"> LPCB (loss prevention Certificate Board, UK) VdS (Verband der Sachversichere.V.), Germany AFNOR - France UL (Underwriters Laboratories Inc.), US SSL (Scientific Services Laboratory), Australia NTC - China
17.8	Codes, Standards & Regulations	<p>The Laser smoke detector should be installed to comply with one or more of the current additions to the following codes or standards:</p> <ul style="list-style-type: none"> British Fire protection systems association, code of practice for category 1 aspirating detection systems. British Standards, BS 5839 part 1:2002 or BS 6266:2002 <p><i>Important Note:</i> The chamber should be fitted with the best of fire/smoke detection system without increasing the reflectivity of the walls of the anechoic chamber. The firm should give the detailed break up of items for the supply and installation</p>
18	Personal Safety from EM Radiations	An interlock switch should be provided at all doors. The switch will lock out instrumentation unless all doors are closed during high power testing to protect the personnel from exposure to high power EM radiation.
19.	Test Bench inside EMC CHAMBER and CS LAB 1. (for MIL STD TEST)	<ul style="list-style-type: none"> As per MIL-STD-461F/G, copper top test bench size of 2.5m (L) x 1.5m (W) x 0.9m (H) with necessary grounding connections. - (1No- for EMC chamber, 2nos- for CS LAB) It should be capable of withstanding a minimum load of 200 kg . The ground plane on top of the table should be self-grounding and the table easily movable on wheels with locks. <p>(B) For floor standing equipment a ground plane of 2.5×1.5metre shall be provided. - (1no. for EMC chamber, 1no for CS LAB)</p> <ul style="list-style-type: none"> The load bearing capacity of the ground plane shall be 2 tons. The ground plane shall have grounding points

	2. FOR CIVILIAN TEST	<p>which will be connected to EUT, accessories for grounding purpose.</p> <p>1.5×1×0.8 meter non-metallic table made of material which is having a dielectric constant less than 1.4 for IEC 61000-4-3 std shall be provided. The table shall withstand maximum weight of 200kgs and shall be easily movable on wheels with locks.</p>
20	EMC Chamber Performance/Acceptance	<p>EMC Chamber performance/Acceptance Test Shall be conducted by a third party reputed ISO/IEC 17025 accredited calibration/testing laboratory. The following performance parameters shall be demonstrated:</p> <ol style="list-style-type: none"> Full compliance with the requirements of MIL STD 461F/G. Shielding effectiveness (SE) performance test shall be conducted before installation of RF absorbers as per IEEE 299 standard and SE shall meet the values provided in the specification (clause 3.4). A leakage test at 433 MHz shall be performed. Full compliance to Field uniformity test as per IEC 61000-4-3, 2006. Full compliance to CISPR 25 latest edition. Electromagnetic Ambient shall be ≤ 6 dB compared to the limit lines specified in the international EMC standards.
20.1	Seismic disturbance criteria	The structure shall be designed to withstand seismic disturbances of Zone III-level defined for building where EMC facilities are installed.
20.2	Chamber Supplier Quality criteria	Chamber supplier shall be certified by ISO 9001 or equivalent quality management system. Supplier shall provide proof of experience in supplying and installing similar chambers successfully. A minimum of 3 such installation references shall be submitted along with the bid.
20.3	Technical Bid documents	<p>Supplier shall provide performance certificate of at least one recently installed 3m EMC chamber (preferably in India) along with technical bid.</p> <p>Vendor may give a presentation on their technical bid proposal.</p>
20.4	Documentation	<p>The following documents shall be provided in the form of hard copy as well as electronic media.</p> <ul style="list-style-type: none"> • Operation and maintenance manuals for <ol style="list-style-type: none"> EMC chamber and doors Fire detection system Audio/Video monitoring and communication system Turn table All other subsystems and accessories • Detailed block diagram with cable layouts for the anechoic chamber, control room, amplifier room and CS lab shielded room. • Details of electrical wiring diagram and chamber

		design diagram. <ul style="list-style-type: none"> • Calibration certificate for equipments/ accessories shall be provided.
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3			General and Technical Specifications for shielded Amplifier Room:		
Sl. No.	DESCRIPTION	Amplifier Room (AR)			
1.	Nominal dimensions of shielded room : (L x W x H) m	(5x2.5x3)m			
2.	Frequency	10kHz to 40 GHz			
3.	Construction of shielded room	Self-Supporting and PAN TYPE modular in Construction			
4.	a) Size of RF Shielded door, (W x H)	(1.2 X2.1) m -1 No			
	b) Door maintenance kit	2 Nos.			
5.	Emergency light on door	1 No			
6.	Raised floor with false flooring.	YES <ul style="list-style-type: none"> • Antistatic PVC finishing or high pressure laminated coating should be provided. • Office type furnishing on the ceiling and walls should be provided for comfortable environmental for operator in the Control Room. 			
7.	Brass Grounding Bolt	to be provided			
8.	Honey comb wave guide Air vents for HVAC	Suppliers to provide the correct number & size			
9.	Power line Filters for Instrumentation systems and EUT				
	a) 415V, 63 Amp/Phase, 50Hz, 3Ø, 4 line	As mentioned in clause 9.5 shall be supplied.			
	b) 230V, 32 Amp/phase, 50Hz, 1Ø	As mentioned in clause 9.5 shall be supplied.			
10.	Access panels: each (18 x 18) inch or nearest size and each AP fitted with 4 N, 6 FSMA & 2 BNC connectors.	* 2 Nos			
11.	Electrical cabling / Wiring	Yes. To be provided			

	by the supplier with their sockets, connectors etc.	
12.	Shielding effectiveness test as per IEEE 299	Yes. To be conducted.
13.	Lighting	Supplier to provide details(same number of spare bulbs shall be supplied)
14.	Any other item/ accessory required shall be provided by the supplier	

Note: *present requirement is given. However CHAMBER supplier need to interact with EMC TEST SYTEM supplier to decide the size, quantity and type of the access panels .

4.	General and Technical Specifications for Shielded Control Room:	
Sl.No.	DESCRIPTION	Control Room
1.	Nominal dimensions of shielding: (L x W x H) m	(5x2.5x3) m
2.	Frequency	10 kHz to 40 GHz
3.	Type of construction	Self-supporting and PAN TYPE modular in nature.
4.	a) Size of RF Shielded door, (W x H)	(1.2 x 2.1) m - 1No.
	b) Door maintenance kit	2 Nos.
5.	Emergency light on door	One
6.	Raised floor with false flooring	<p>YES</p> <ul style="list-style-type: none"> • Antistatic PVC finishing or high pressure laminated coating should be provided. • Office type furnishing on the ceiling and walls should be provided for comfortable environmental for operator in the Control Room.
7.	Brass Grounding Bolt	To be provided.
8.	Honey comb wave guide Air vents for HVAC	Suppliers to provide the correct number & size
9.	Power line Filters for lighting & Instrumentation Systems	
	a)415V, 63 Amp/Phase, 50Hz, 3Ø, 4 line	As mentioned in clause 9.4 shall be supplied
	b)230V, 32 Amp, 50Hz, 1Ø	As mentioned in clause 9.4 shall be supplied
	c)115V, 32 Amp/Phase, 400Hz, 3Ø, 4 line	As mentioned in clause 9.4 shall be supplied
	d)DC Power Supply 500V,	As mentioned clause 9.4 shall be supplied

	100Amp, 2 line	
10.	Access panels: each (400 x 400) mm or nearest size and each AP fitted with 4 N, 6 FSMA & 2 BNC connectors.	* 2 Nos
11.	Electrical cabling / Wiring by the supplier with their sockets, connectors etc.	YES. To be provided.
12.	Shielding effectiveness test as per IEEE 299	YES. To be conducted.
13.	Lighting	Suppliers to provide details. (same number of spare bulbs shall be provided)
14.	Any other item/ accessory required shall be provided by the supplier	

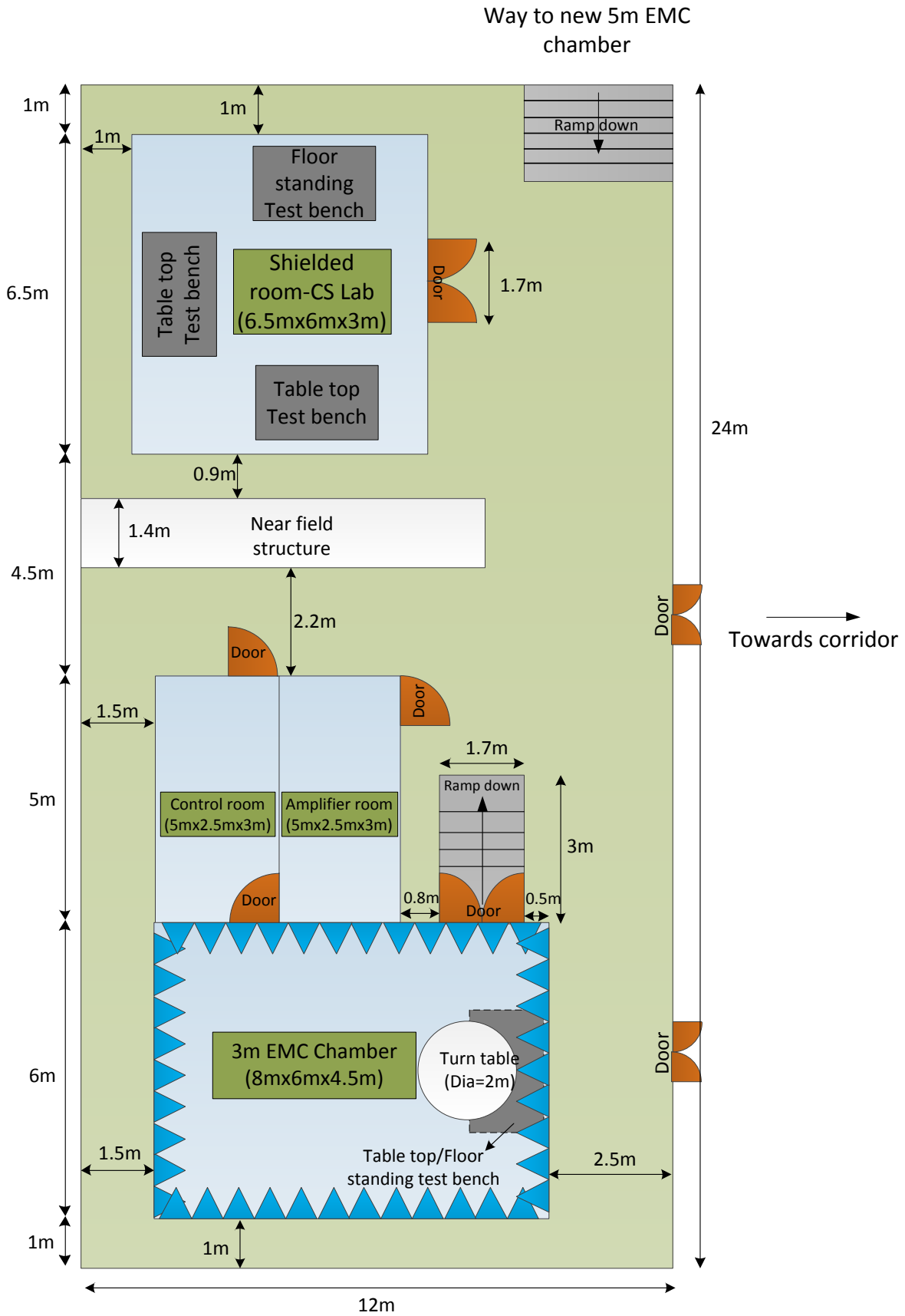
Note: *present requirement is given. However CHAMBER supplier need to interact with EMC TEST SYTEM supplier to decide the size, quantity and type of the access panels.

5.	General and Technical Specifications for Conducted Susceptibility Lab Shielded Room:	
Sl.No.	DESCRIPTION	Conducted Susceptibility Lab shielded Room
1.	Nominal dimensions of shielding: (L x W x H) m	(6.5 x 6 x 3) m
2.	Frequency	10 kHz to 40 GHz
3.	Type of construction	Self-supporting and PAN TYPE modular in nature.
4.	a) Size of RF Shielded door, (W x H)	(1.7 x 2.5) m - 1No.
	b) Door maintenance kit	2 Nos.
5.	Emergency light on door	One
6.	Flooring and furnishing	YES <ul style="list-style-type: none"> • Antistatic PVC finishing or high pressure laminated coating should be provided. • Office type furnishing on the ceiling and walls should be provided for comfortable environmental for operator.
7.	Brass Grounding Bolt	To be provided.
8.	Honey comb wave guide Air vents for HVAC	Suppliers to provide the correct number & size
9.	Power line Filters for lighting & Instrumentation Systems	
	a)415V, 100 Amp/Phase, 50Hz, 3Ø, 4 line	As mentioned in clause 9.6 shall be supplied
	b)230V, 63 Amp, 50Hz, 1Ø	As mentioned in clause 9.6 shall be supplied

	c)115V, 32 Amp/Phase, 400Hz, 3Ø, 4 line	As mentioned in clause 9.6 shall be supplied
	d)DC Power Supply 500V, 100Amp, 2 line	As mentioned in clause 9.6 shall be supplied
10.	Access panels: each (400 x 400) mm or nearest size and each AP fitted with 4 N, 6 FSMA & 2 BNC connectors.	* 1 No.
11.	Electrical cabling / Wiring by the supplier with their sockets, connectors etc.	YES. To be provided
12.	Shielding effectiveness test as per IEEE 299	YES. To be conducted.
13.	Lighting	Suppliers to provide details(same number of spare bulbs shall be supplied)
14.	Any other item/ accessory required shall be provided by the supplier	

Note: *present requirement is given. However CHAMBER supplier need to interact with EMC TEST SYTEM supplier to decide the size, quantity and type of the access panels .

Plan diagram of EMC CHAMBER and CS LAB in the existing 24×12×5.5m RCC BUILDING:



6. Technical Terms and Conditions		
i)	Detailed requirements for installation and commissioning	<p>a) The chamber supplier shall meet all the technical requirements of Test and Measurement system supplier in providing necessary access panels/feed through panels at the time of installation of Test and Measurement systems.</p> <p>b) The chamber supplier shall provide the following details:</p> <ol style="list-style-type: none"> i. Requirements of Floor load and evenness of the host building to install the chamber. ii. Relative position of turn table inside the chamber. iii. Requirements of HVAC such as number of ducts, duct location, capacity of air conditioning plant and duct connectivity to the chamber. <p>c) Any other special requirements for installation of chamber.</p>
ii)	Review/ Inspection Requirements	<ul style="list-style-type: none"> • Supplier shall provide the total chamber design for review by SAMEER. • Site Inspection and acceptance should be based on mutually agreed terms and conditions.
iii)	Warranty clause	<ul style="list-style-type: none"> • Warranty of the anechoic chamber will be for a period of 10 years. During this period, if performance of chamber degrades due to deterioration of materials like absorbers, shielding panels etc. should be replaced free of cost. • Warranty of all other subsystems and accessories such as shielded doors, CCTV system, turntable, audio communication system, fire detection system, power line filters etc. will be for a period of 3years.
iv)	Compliance certificates	<ul style="list-style-type: none"> • Supplier shall provide compliance certificate for EMC chamber, subsystems and accessories. • SAMEER's technical team can visit a similar EMC chamber installed by the supplier (preferably in India) to assess the performance and service. • Delivery will be made within 180 days from the date of the drawing approval given by SAMEER. However before shipment, approval from SAMEER need to be taken. Delivery means goods arriving on site. <p><i>Any other requirement arises afterwards related to chamber which is not specified in chamber specification will be discussed during finalization of purchase order.</i></p>
v)	AMC(optional)	<ul style="list-style-type: none"> • The supplier shall take up AMC contract for a minimum period of 7 years after warranty period.

		<ul style="list-style-type: none"> • An annual maintenance contract shall be proposed which includes: • Yearly onsite visit for test and verification of the chamber, subsystems and accessories. Faulty and worn parts shall be replaced. • AMC charges per year shall be quoted in the price bid.
vi)	Factory Acceptance Test	<p>4 scientists will be deputed from SAMEER for witnessing factory acceptance test at supplier's premises for a minimum of 5 working days.</p> <p>In case no one is deputed from SAMEER due to unforeseen problems, an integrated test report shall be submitted by the supplier before dispatching the system.</p>
vii)	Training	Training for SAMEER scientists for 5 working days shall be provided at SAMEER.

Technical Bid shall include the following

- a. EMD as specified in the invitation to bids
- b. MSME/NSC Certificate If, EMD waiver is claimed
- c. Tender fee as specified in the invitation to bids
- d. Service Support Details Form
- e. Deviation Statement Form
- f. Technical Specification Compliance Form
- g. Manufacturer's Authorization Letter
- h. Bidder's Performance Statement Form
- i. Equipment Data sheet/Technical specification
- j. Tender document (Page No.3 to 16) duly signed by the bidder with company seal.

I/We certify that all the terms and conditions of the tender documents are acceptable to us.

Signature of the authorized person

Name :

Designation :

Company Seal :

Date :

Place :

Cover-II (Price)**Format for Price Bid****IMPORTANT**

Bidder is required to submit the price bid in the given format on their LETTER HEAD.

ITEM	DESCRIPTION	QUANTIY	PRICE IN INR	PRICEIN (Name of the currency)
I	3m Ferrite tiled hybrid Shielded Anechoic Chamber with 1.2m quiet zone	1no		
II	Shielded Control room	1no		
III	Shielded Amplifier room	1no		
IV	Conducted Susceptibility Lab shielded room	1no		
V	Associated equipment's			
VI	Any other related Accessories			
1.	TAXES AND DUTIES APPLICABLE ON ITEMS			
	I			
	II			
	III			
	IV			
2.	INSURANCE			
3.	Installation, Commissioning & Performance Testing charges			
4	Commission for Indian Agent			
5	Third Party validation			
	TOTAL AMOUNT			
	TOTAL AMOUNT (IN WORDS)			

Signature of the Manufacturer/authorized agent

Name :

Company Seal:

Date :

Place :

ANNEXURE -I

MANUFACTURER'S AUTHORIZATION LETTER

Dated-----

To
The Programme Director
SAMEER-Centre for Electromagnetics
CIT Campus, 2nd Cross Road,
Taramani
Chennai - 600 113
INDIA.

Dear Sir:

We _____ who are established and reputed manufacturers of having factories at _____ (*address of factory*) do hereby authorize M/s. _____ (*Name and address of Agent*) to submit a bid, negotiate and receive the order from you against your tender enquiry.

No company or firm or individual other than M/s _____ is authorized to bid and conclude the contract in regard to this business.

We hereby extend our full guarantee and warranty as per the requirement of SAMEER-CEM mentioned in the tender document for the goods and services offered by the firm.

Yours faithfully,

(Name)

(Name of manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturer and should be signed by a person competent and having the power of attorney to bind the manufacturer. It should be included by the Bidder in its techno-commercial un priced bid.

ANNEXURE -II

BIDDER'S PERFORMANCE STATEMENT FORM

(For a Period of Last 5 Years)

Order placed by (full address of purchaser)	Descripti on and quantity of ordered similar chamber	Order No and Date	Price	Date of Completi on of delivery as per Contract/ Actual	Remarks indicating reasons for late delivery, if any	Has the chamber been installed satisfactor yly?	Contact Person along with Tel.No., Fax No. & e- mail address

Name of the bidder

Signature & Seal

Date :

Place :

ANNEXURE-IIISERVICE SUPPORT DETAILSFORM

SL. No.	Nature of training imparted	List of similar type items's /services in the past 3 years or as per Tender Enquiry/Document	Address, Telephone Nos., Fax and email address of the firm located in India	Value of minimum stock of consumable spares held at all times

Signature and Seal of the manufacturer/Bidder

Place:

Date:

ANNEXURE-IVDEVIATION STATEMENT FORM

The following are the particulars of deviations from the requirements of the tender document and specifications:

CLAUSE	DEVIATION	REMARKS (INCLUDING JUSTIFICATION)

Signature and Seal of the Manufacturer/Bidder

Place :

Date :

NOTE:

Where there is no deviation, the statement should be returned duly signed with an endorsement indicating "No Deviations"

ANNEXURE-VTECHNICAL SPECIFICATION COMPLIANCE STATEMENT FORM

An item-by-item commentary on the SAMEER-CEM Technical Specifications demonstrating substantial responsiveness of the item's to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications. (Technical literature/brouchers/manuals should be attached along with this format)

ITEM NAME			
SI.No	Tender Specifications	Bidder's Specifications	Remarks/Deviation if any

(Technical literature/brouchers/manuals should be attached along with this format)

Please note:

1. Compliance statement should compare the specifications of the quoted model to the required specifications. This statement should also give the page number(s) of the technical literature where the relevant specification is mentioned.
2. Bids must have supporting documents (technical literature or copies of relevant pages from the service manual or factory test data) for all the points noted above, failure regarding which may result in rejection of bid.

Signature of the authorized person:

Name :

Designation :

Company Seal :

Date :

Place :

ANNEXURE-VI

DECLARATION CERTIFICATE BY

THE THIRD PARTY AGENCY

TO WHOM IT MAY CONCERN

This is to certify that following **RF Shielded Anechoic Chamber** offered to us for validation by M/s _____ has been validated by us as per the standards mentioned in the technical specifications.

Date :

Signature of Third Party

Seal