CORRIGENDUM -II Dated 23.11.2020

Attention is invited to Tender No. S-CEM/IP/1080/PTE/102-01/2020-2021 dated 06.10.2020, for the **Supply, installation, Commissioning, Performance Testing and Validation of RF Shielded Anechoic Chamber.** Technical Specifications and commercial terms has been revised after pre-bid meeting held on 15.10.2020.

TENDER NO.: S-CEM/IP/1080/PTE/102-01/2020-2021 **Supply, installation, Commissioning, Performance Testing and Validation of RF Shielded Anechoic Chamber**				
Sl. No	**Page No.**	**Clause No.**	**Published as:**	**Revised as:**
Commercial Terms				
1	Page 2 of 66	Tender Schedule	Last date and time of submission of bids: **30th November,2020 at 14:00 Hrs**.	Last date and time of submission of bids: **10th December, 2020 at 14:00 Hrs.**
2	Page 2 of 66	Tender Schedule	Date, time and Place of opening of Technical Bid: **30th November,2020 at 14:30 Hrs.** at SAMEER-CEM,2nd Cross Road, Taramani, Chennai - 600 113	Date, time and Place of opening of Technical Bid: **10th December,2020 at 14:30 Hrs.** at SAMEER-CEM,2nd Cross Road, Taramani, Chennai - 600 113
3	Page 8 of 66	**9**	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, 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 thechamber within 60 days from the date of arrival of the chamber at SAMEER-CEM.**The successful bidder should take all precautionary measures to ensure the safety of the workmen during installation of the chamber and SAMEER shall not be responsible in case of any eventuality**	installation/commissioning and testing of chamber. However, the successful bidder shall arrange and complete the installation of thechamber **within 120 days from the date of arrival of the chamber at SAMEER-CEM**.**The successful bidder should take all precautionary measures to ensure the safety of the workmen during installation of the chamber and SAMEER shall not be responsible in case of any eventuality. If the installation is not completed within 120 days penalty will be levied as mentioned in the clause No. 38.1 of the tender document.**
4	Page 8 of 66	**11**	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.	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.18*)**. 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.
5	Page 9 of 66	15.2	(i)A detailed description of the essential technical and performance characteristics of The 3 RF Shielded Anechoic Chamber and Shielded conducted susceptibility room	(i)A detailed description of the essential technical and performance characteristics of the 5M ferrite tiled hybrid shielded Anechoic Chamber with Control room and amplifier room.
6	Page 9 of 66	12 (a)	Delivery period is 180 days from the date of design approval by SAMEER-CEM and after opening irrevocable Letter of Credit (LC) by sight. **However, the successful bidder shall submit the design plan within 30 days on receipt of Purchase order. Part shipment is not permitted**	Delivery period is **240** days from the date of design approval by SAMEER-CEM and after opening irrevocable Letter of Credit (LC) by sight. **However, the successful bidder shall submit the design plan within 30 days on receipt of Purchase order. Part shipment is permitted(not more than 3 shipments) and the last supply should be made within 240 days**
7	Page 11 of 66	19	The bid document shall be submitted in the above mentioned address latest by **14.00 hrs. on 30.11.2020**	The bid document shall be submitted in the above mentioned address latest by **14.00 hrs. on 10.12.2020**
8	22 of 66	II) 1.	**5m Ferrite tiled hybrid shielded Anechoic Chamber:** External shield to shield dimension of Anechoic Chamber LxWxH [m]:12.5 x8.2x6(±5%)- rectangular or square design	**5m Ferrite tiled hybrid shielded Anechoic Chamber:** External shield to shield dimension of Anechoic Chamber LxWxH[m]:12.5 x8.2x6 (±5%)
9	25 of 66	II)3.2	Thickness of galvanization should be min.275g/m² by chemical passivation according to DIN/EN 10143standards.	Thickness of galvanization should be minimum 275gm/m² by chemical passivation according to DIN/EN 10143 or equivalent standards.
10	25 of 66	II)3.3	The floor of the chamber preferably built as elevated raised floor (300mm to 400mm high)	The floor of the chamber is built on top of a pit of depth 300mm to 400mm as elevated

			with PVC flooring on the ground plane in line with all the doors there should and the turn table surface. This floor should accept **3 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 **2 ton/sqm.**	raised floor. The elevated raised floor of the chamber and concrete surface outside chamber are at the same level. PVC flooring shall be made over the ground plane inside the chamber. The PVC flooring shall be in line with all the doors and turn table surface. Provision for necessary arrangement for mounting of ground plane, grounding of LISN etc shall be made in PVC flooring. This floor should accept **3 Tons/sqm** loads throughout the chamber.
11	26 of 66	II)3.6	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.	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 or any other suitable arrangement.
12	27 & 28 of 66	II)4.3	All Pyramidal absorbers shall be painted/plastic coated and d e s i g n e d 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.	All Pyramidal absorbers shall be d e s i g n e d for longer life time with excellent shape retention. If foam based open cell absorbers are supplied it shall be painted/plastic coated. • Guaranteed Reflectivity of absorbers at Normal Wave Incidence should be better than the values given in the

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<tr><th>Frequency</th><th>Reflectivity (dB)</th></tr>
<tr><td>30 MHz</td><td>-13</td></tr>
<tr><td>200 MHz</td><td>-15</td></tr>
<tr><td>300 MHz</td><td>-15</td></tr>
<tr><td>500 MHz</td><td>-18</td></tr>
<tr><td>1 GHz to 40 GHz</td><td>-15</td></tr>
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Power handling capability: The absorbers shall be able to with stand 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 DIN4102 B2 evaluation according to the report NRL8093 test levels 1, 2, 3 and reports to be submitted. The fire retardant test report shall not be older than 5 years.

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<tr><td>500 MHz</td><td>-17</td></tr>
<tr><td>1 GHz to 40 GHz</td><td>-13</td></tr>
</table>

Power handling capability: 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 DIN4102 B2 or latest/NRL8093 test levels 1, 2, 3 and reports to be submitted. The fire retardant test report shall not be older than 5 years.

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<tr>
<td>13</td>
<td>29 of 66</td>
<td>II)5.1</td>
<td>Double leaf swing door of Anechoic chamber

Purpose: Movement of EUT.
Type: Pneumatically operated Double leaf swing Door fitted with absorbers.</td>
<td>Double leaf swing door/Sliding door of Anechoic chamber

Purpose: Movement of EUT.
Type: Pneumatically operated Double leaf swing Door/Sliding Door fitted with ferrites</td>
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			Dimension: 2500mmx2500mm(WxH)±50mm tolerance **Door Type:** Double knife edge/Blade type, shielded door fitted with ferrites and absorbers. **LOCK:** Provision for locking the door shall be provided. **Ramp:** Suitable ramp shall be provided. The load bearing capacity of the ramp shall be 3.0 Tons.	and absorbers. **Dimension:** 2500mmx2500mm(WxH)±100mm tolerance **Door Type:** Sliding Door**/**Double leaf swing door with Double/Triple knife edge/Blade type, shielded door fitted with ferrites and absorbers. **LOCK:** Provision for locking the door is preferred. **Ramp:** Suitable ramp shall be provided. The load bearing capacity of the ramp shall be 3.0 Tons.
14	29 of 66	II)5.2	• **Dimension(WxH):**1000mmx2000mm±100 mm • **Door Type:** Single door of Double Knife Edge/Blade type, shielded door fitted ferrites and absorbers.	• **Dimension(WxH):**1200mmx2100mm±1 00mm • **Door Type:** Single Door with Double/Triple Knife Edge/Blade type (Bronze or Stainless steel), shielded door fitted with ferrites and absorbers with manual swing motion.
15	30&31 of 66	II)5.3	• **Door Type:** Single door of Double Knife Edge/Blade type, shielded door **w**ith manual swing motion. Opening outside of the room. Manual opening facility from inside the room for emergency exit. • **Lock:** Provision for lock shall be	• **Door Type:** Single Door with Double/Triple Knife Edge/Blade type (Bronze or Stainless steel), shielded door with manual swing motion. Opening, outside of the Control room. Manual opening facility from inside the room for emergency exit.

			provided.	• **Lock:** Provision for lock is preferred.
16	31 of 66	II)5.4	• **Door Type:** Double Knife Edge/Blade type, shielded door/Single leaf door, and manual swing motion. Opening outside of the amplifier room. Manual opening facility from inside the amplifier room for emergency exit. • **Lock:** Provision for lock shall be provided.	• **Door Type**: Single Door with Double/Triple Knife Edge/Blade type (Bronze or Stainless steel), shielded door with manual swing motion. Opening, outside of the Amplifier room. Manual opening facility from inside the Amplifier room for emergency exit. • **Lock:** Provision for lock is preferred.
17	34 of 66	II)7.2	Provision for smoke exhaust shall be provided to meet automotive testing requirements.	• Fume Extraction facility: Exhaust vent is to be installed under the turn table, located at the rear of the vehicles having capacity from two wheeler to four wheeler. • The air suction area and also the air outlet through the surface of the turn table shall be EMC screened with honeycomb filter. • Details to be submitted with technical bid
18	34 of 66	II)7.3	RF Access panel : 1Number.(consists of the following) **1. RF connectors with caps (of precision type) on each panel:**	A). RF Access panel : 1Number.(consists of the following) **1. RF connectors with caps (of precision type):**

			2. Other connectors required on each panel: 3. Dummy RF Access panel for future Requirements …….... 1 No. 5. Two filters for signal lines(2lines each)	**2. Other connectors required :** B) Dummy RF Access panel of size similar to RF Access panel mentioned at (A) for future requirements …….1 No.. 5. Deleted
19	35 of 66	II)7.4	RF Access panel……1 No.(consists of the following) ***1. RF connectors with caps (precision type):*** **2. Other connectors required on each panel:** Filters for signal lines – 2Nos(2 lines each) 3. Dummy RF Access panel for future requirements …….1 No.	A).RF Access panel……1 No.(consists of the following) ***1. RF connectors with caps (precision type):*** **2. Other connectors required:** Deleted.--(filter for signal lines-2nos)-- B). Dummy RF Access panel of size similar to RF Access panel mentioned at (A) for future requirements …….1 No.
20	35&36 of 66	II)7.5	1.RF Access panel(Size:18inchx18 inch) ……1No. 2. Dummy RF Access panel for future requirements … 1No.	A).RF Access panel……1No. B) Dummy RF Access panel of size similar to RF Access panel mentioned at (A) for future requirements …….1 No.
21	36 of 66	II)7.6	1. To provide required quantity with suitable size panels As specified by the equipment supplier at a later stage.	1. Deleted 2. Additional requirements for Different type of connectors on shielding panel as per the requirement of equipment supplier will be

			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 – 1No.	provided by us at a later stage. It is the responsibility of the chamber supplier to fix the same on the access panel. 3. Deleted. 4. All the 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 – 1No.
22	38 of 66	II)9.3	**Filter rating for RF Shielded Anechoic Chamber:** • 415VAC,100Amp/Phase,50Hz,3Ø,4 line…… 2Nos + 1No.spare shall be provided. • DC 500V, 100Amp, 2line……..1No+ 1No.spare shall be provided. • 230VAC, 63Amp, 50 Hz, 1Ø, 3line……2Nos +1No. spare shall be provided. • 115VAC,32Amp/Phase,400Hz,3Ø,4line…	• 415VAC,100Amp/Phase,50Hz,3Ø,4 line…… 2Nos + 1No.spare shall be provided. • DC 500V, 100Amp, 2line……..1No+ 1No. spare shall be provided. • 230VAC, 60/63Amp, 50 Hz, 1Ø, 3line……2Nos +1No. Spare shall be provided. • 115VAC,30/32Amp/Phase,400Hz,3Ø,4 line……1 No.

			……1 No	
23	38 of 66	II)9.4	**Filter rating for Control Room:** • 415VAC,63Amp/Phase,50Hz,3Ø,4line…..1No + 1No. spare shall be provided. • 230VAC,32Amp,50Hz,1Ø……. 1No+ 1No. spare shall be provided. • 115VAC,32Amp/Phase,400Hz,3Ø,4line……1 No+ 1No. spare shall be provided. • DC 500V,100Amp,2line……..1No+ 1No. spare shall be provided.	• 415VAC, 60/63Amp/Phase,50Hz,3Ø,4line…….. 1No + 1No. spare shall be provided. • 230VAC, 30/32Amp,50Hz,1Ø…….1 No+ 1No. spare shall be provided. • 115VAC, 30/32Amp/Phase, 400Hz,3Ø,4line……1 No+ 1No. Spare shall be provided. • DC 500V,100 Amp, 2line……..1No+ 1No. Spare shall be provided.
24	38 of 66	II)9.5	**Filter rating for Amplifier room:** • 415VAC,63Amp/Phase,50Hz,3Ø,4 line…….1 No+ 1No. spare shall be provided. • 230VAC,32Amp,50Hz,1Ø…… …….1No+ 1No. spare shall be provided.	• 415VAC, 60/63Amp/Phase, 50Hz, 3Ø,4 line…….1 No+ 1No. Spare shall be provided. • 230VAC, 30/32Amp, 50Hz, 1Ø…… …….1No+ 1No. spare shall be provided.

25	39 of 66	II)11	**ILLUMINATION** LED high power EMI free lights should be installed within the main chamber, control room, amplifier room and conducted susceptibility lab must meet 300-500LUX 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.	**ILLUMINATION** LED high power EMI free lights should be installed within the main chamber, control room, amplifier room and conducted susceptibility lab must meet 300-500LUX measured at 1m from the floor ground plane for the full area .The lights shall be warranted at least 10 years. The lights switches should be provided at convenient position adjacent to both the main entrance Door/Personnel access door.
26	40 of 66	II)12.1	Positioning accuracy: Better than±0.1°or as per the standard Requirement	Positioning accuracy: Better than±0.5°or as per the standard Requirement
27	41 of 66	II)13.1	3. Desk top computer with the following specification, **Qty.1No.**	Desk top computer, if required with the following specification, **Qty.1No.**
28	42 of 66	II)13.3	3.Immunity ≥200Vm upto 40GHz (copy of laboratory test report to be submitted with technical BID)	3.Immunity ≥200V/m up to 40GHz (Necessary supporting documents to be submitted with technical bid)
29	43 of 66	II)14	High sensitivity and power full audio system perfectly shielded (EMI freeandEMS200V/m compliant) should be installed between the SAC 5m and the control room. This full duplex system is mobile and can be used for easy	High sensitivity and power full audio system perfectly shielded (EMI free and EMS 200V/m compliant) should be installed between the SAC 5m and the control room. This full duplex system is mobile and can be

			communication from the SAC to the Control Room and vice versa, as well as to monitor the sound from EUT under strong tests. Between the Control Room and Amplifier Room and the outside of the lab a shielded intercom system has to be supplied.	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. --(para 2 deleted)--
30	46 of 66	II)17	• As per MIL-STD-461F/G, copper top test bench size of 2.5m**(L)x1.5m (W) x0.9m(H)** with necessary grounding connections. – (1No- for EMC chamber) B) For floor standing equipment a ground plane of 2.5×1.5metre shall be provided. - (1no. for EMC chamber)	A) As per MIL-STD-461F/G, copper top test bench Size of **3.5m(L)x1.25m(W)x0.85m(H)** with necessary grounding connections. – (1No- for EMC chamber). Table shall be fitted with Suitable heavy duty Wheels with locking provision taking into consideration of EUT weight . Arrangement for bonding test bench to wall of the chamber shall be provided on 3 sides of the chamber as shown in the plan diagram of EMC chamber. B) For floor standing equipment, copper ground planes of **3.5×1.25** metre - 1No and **1x1metre** -1No shall be provided. Arrangement for bonding ground plane to the wall or floor of the chamber shall be provided on 2 sides of the chamber as shown in the plan diagram of EMC Chamber. Test bench/ground plane shall be electrically bonded to chamber. The metallic bond straps

				shall be solid and maintain a five-to-one ratio or less in length to width. The DC resistance between test bench/ground plane to chamber shall be 2.5milliohms or less as per the requirements of MIL-STD 46 F/G.
31	47 of 66	II)18	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: a. Full compliance with the requirements of MIL STD 461F/G. b. 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. c. Full compliance to Field uniformity test as per IEC 61000-4-3, 2006. d. Full compliance to CISPR 25 latest edition including ALSE validation. e. Electromagnetic Ambient shall be ≤ 6 dB compared to the limit lines for "GROUND ARMY" application as specified in MIL STD 461F	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: a. Full compliance with the requirements of MIL STD 461F/G. b. 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 tender specification (clause 3.4). A leakage test at 433 MHz shall be performed. c. Full compliance to Field uniformity test at 3m distance as per IEC 61000-4-3, 2006. d. Full compliance to CISPR 25 latest edition including ALSE validation. e. Electromagnetic Ambient shall be ≤ 6 dB compared to the limit lines for "GROUND ARMY" application as

				specified in MIL STD 461F/G. f. Normalized Site Attenuation better than **±3.5 dB**, according to CISPR 16-1-4 Ed3.1 and ANSI C63.4 from 30 MHz – 1 GHz at 5m and 3m test distance for a quiet zone of 3m diameter and 2m height. g. Site VSWR (1- 18 GHz) ≤ 5.5 dB at 3m and 5m according to CISPR 16-1-4 Ed3.1, for a quiet zone of 3m diameter and 2 height. Measurement of Site VSWR should be carried out from 1GHz to 18 GHz.
32	49 of 66	III) 6.	Office type furnishing on the ceiling and walls should be provided for comfortable environmental for operator in the Control Room.	Office type furnishing on the ceiling and walls should be provided for comfortable environmental for operator.
33	49 of 66	III) 9	Power line Filters for Instrumentation systems and EUT: a) 415V,63Amp/Phase,50Hz,3Ø,4 line b) 230V, 32Amp/phase,50Hz,1Ø	Power line Filters for Instrumentation systems and EUT: a) 415V, 60/63Amp/Phase,50Hz,3Ø,4 line b) 230V, 30/32Amp,50Hz,1Ø 3 line
34	50 of 66	IV) 9	Power line Filters for lighting & Instrumentation Systems a)415V,63Amp/Phase,50Hz,3Ø,4 lines b)230V,32Amp,50Hz,1Ø, 3lines c) 115V, 32 Amp/Phase,400Hz,3Ø,4 lines	Power line Filters for lighting & Instrumentation Systems a)415V, 60/63Amp/Phase,50Hz,3Ø,4 lines b)230V, 30/32Amp,50Hz,1Ø, 3lines c) 115V, 30/32 Amp/Phase,400Hz,3Ø,4 lines

			d) DC Power Supply 500V,100Amp,2 line	d) DC Power Supply 500V,100Amp,2 lines
35	54 of 66	6 (i)a	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.	The chamber supplier shall support the fixing of connectors/feed through to the access panels at the time of installation of Test and Measurement system.