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Detailed Technical Specifications for Acoustic Faraday Cabin/Chamber

In this document, noise refers to radio frequency interference (RFI), acoustic (sound) and vibrations (rubber insulation on the floor). The aim of building this Cabin/Chamber is to reduce outside noise (mentioned in specification section below) entering into the Cabin, also Cabin providing the functionality of RFI free environment inside the Cabin. This Cabin will be used to conduct cognitive studies on humans. A participant (human) will sit/sleep inside the chamber and interact with a computer for up to ~10 hours. Outside to inside sound attenuation of minimum ~35 dB must be maintained inside the Cabin. During experiments, RFI noise generation and its measurement will not happen inside the Cabin, so no RFI treatment (e.g., foam, pyramids) is required inside the Cabin except acoustical treatment for echo/reverberation. All the material used should be fire retardant (IS3144).

Site information: This Cabin will be installed on the ground floor (street level). It should be feasible to relocate the Cabin whenever required (modular in design reassembled at new location so that it will not incur any addition cost towards the materiel except expandable stores like sealing gaskets/glue and labour charges).

The Cabin and its accessories shall be as per the technical specification and details furnished in this document. Clear inner dimensions of Cabin shall be L=3353mm x W=3353mm x H=3657mm inclusive of inner wall treatment. Please mention the outer dimension of your design clearly in the quote.

SPECIFICATION:

1. The shielding effectiveness of all the parts, components, and accessories of the Cabin (placed inside the Cabin) should be the same as that of the Cabin.
2. The Cabin shall be designed to meet the acoustic noise reduction of 35+ dB (A). Attenuate incident sound energy from frequencies concentrated in the 125 to 8000-hertz range to meet the ANSI standards: ANSI S3.1-1999 (R2003). Minimum RFI noise reduction of 80+ dB between 20KHz – 100Mhz and 100+dB between 100MHz - 40GHz (As per EN 50147-1).
3. Swing door (guarantied acoustic/RFI performance for 6000 opening and closing operation each), door size minimum 1000mm width and minimum height 2100mm, door handle, both side locking unlocking mechanism. Test in Progress Lights over the door must be supplied.
4. There must be a vision panel (minimum 500mmx500mm) on the door or the door's side wall.
5. A removable wheelchair access ramp must be installed.
6. Silent/sound-dampen/muffler VRF/HVAC air vents (outside on the roof of the Cabin) for proper air circulation with the same noise performance as other chamber parts. Inner interior material should maintain desired echo/reverberations (ASTM C423).
7. Electrical Distribution panel with power filter (single-phase, 32Amps AC), and supplied with MCB. Patch panel with filters for connecting devices from outside to inside. Patch panel with Filters: DisplayPort (Female-Female Qty2), USB (low loss converters, Female-Female Qty4), PoE Ethernet (Female-Female Qty5), Fiber optic (Female-Female Qty2), Speaker (Stereo

Female-Female Qty2), IP camera, fire alarm (signal filter), generic connection like adapters, pipes must be supplied. Shielding effectiveness of these patch panel and its filters should match as of the Cabins performance.

8. Proper RF shielding material and accessories to be used between panels.
9. Multi-point (connecting each side of the Cabin– at least 6) copper earthing connection (≤ 2 ohm) with copper based maintenance-free chemical earthing (≤ 2 ohm) pit must be provided.
10. Standalone modular cabin, appropriate noise-free lighting, preventing acoustical vibration through the floor (using appropriate mat underneath the Cabin).
11. At least two 2x2 full-length wooden planks (non-fire retardant would be acceptable) on each wall and ceiling to hang articles/accessories.
12. Small two level (lower level for desktop CPU unit and top level with RFI/EMI vision glass, total internal clearance size: W 40" x H (Lower 25"+ Upper 25") x D (20") with wheels) (re)movable acoustic faraday cage with Earthing Connection with air vents and cable pass through holes.
13. Internal LED lights must be EMI free.
14. Fire alarm sensor should be installed.
15. Performance test Certificates for acoustic (0-20KHz) and for RFI (zero to 18GHz) must be provided for the supplied system. Self certification is acceptable but the Test Equipment should be calibrated by NABL and that certificate copy should be submitted. The test plan will be approved by Prof. Gupta.

Terms and condition is attached in the ANNEXURE 1 (Acoustic Faraday Cabin Tech Specs- T&C)

ANNEXURE 1
Terms and conditions
for Acoustic Faraday Cabin Tech Specs

1. Location of the delivery would be inside IIT Bombay campus at the CBN Lab.
2. The bidder shall write the specifications for each (sub)specification in detail. Mere writing “COMPLY” or “YES/NO” or “insufficient details” is not sufficient and such offers are liable for rejection.
3. Pre-bid meeting (online) will be held after 15 days of the publication of the tender. Meeting link will be provided through email. Attending pre-bid meeting is mandatory. Failing in attending the meeting will result in bid disqualification.
4. Please share the STC (Sound Transmission Coefficient) rating of the cabin panels along with the certifications confirming to ISO 8528, and equivalent DIN & IS.
5. Please share the Certificate for the Noise insulating material confirming to I.S. and B.S. standards for the density.
6. The supplier must get the sample approved before starting manufacturing of the cabin (must be as per ISI/ISO standard) of below-mentioned items:
 - EMI free LED light,
 - Switchboard
 - Patch panel (connections)
 - Honeycomb copper, GI, Aluminium, tin
 - Vision panel
 - Door locks for main and emergency exit door
 - All component GI design
7. The supplier must bring out all details of acoustic material to be used and cabin fabrication details clearly along with necessary technical specifications, Design calculations & Standards like ISO, sound transmission ratings, etc., along with the offer.
8. Any modifications for betterment must be clearly mentioned.
9. The expected life of the Cabin shall be a minimum of 12 years, and performance should be guaranteed for at least 10 years.
10. Detailed G.A. (General Arrangement) design must be supplied by the vendor and approved by Prof. Rashmi Gupta (P.I., CBN Lab, Department of HSS) before manufacturing begins.
11. The warranty of the Cabin (including all parts and accessories) must be for two years.
12. The bidder needs to comply mandatory that AMC of the item will be provided for the next 10 years and the cost of yearly AMC should not exceed 10% cost of the item. Repair/replacement SLA (Service level agreement) should be of <=72Hrs.
13. Payment will be released in phases. After getting the 2D and accessories drawing approval when site visit, final designs, approval of tentative work plan/material, and delivery, 80% amount will be released. Upon commissioning (successful installation, testing and operation) of the Cabin 20% amount can be released. (3% PBG will be asked to be deposited)
14. Any replacement under warranty period (2 Year), the vendor should do it free of cost.

15. The delivery time must be up to 12-20 Weeks from the date of the placement of the supply order.
16. Video-audio recorded Online/Physical inspection from Prof. Rashmi Gupta, CBN Lab will be conducted before dispatching the final product from the factory.
17. Performance requested must be matched at the time of handover, self-certification must be issued by the supplier for the required specification in this document. Otherwise, the supplier will be responsible for the non-compliant product.
- 18.** At least 3 years of experience in the manufacturing and installing similar acoustic and RFI chambers test facility in various organizations in India and abroad (e.g., PO/completion certificate, etc.)