

SOC Room Interior Technical Specification			
S.No	Detailed Description	Unit	Quantity
1	Supply of Modular Rigid PVC Metal Panelling 1) Factory made removable type self inter lockable metal panels with front sheet of Preformed Textured Hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC Coating atleast 0.11mm). The back cover of the panel shall be made up of 0.6mm thick CRCA/GI sheet of approved colour. The panelling design shall comprise of specially designed combination of perforated and nonperforated panels through CNC laser Cutting, bending & punching. Panels shall be designed to achieve shape and design as per the design consultant and shall be fixed using GI/CRCA hook fitting on structure. The metal panelling/partition shall be greenguard gold tested/certified (from UL/Intertek). Valid certificate/test report to be submitted along with the technical bid. Overall system thickness for panelling shall be 60mm to 90mm and for partition shall be 70mm to 120mm. 2) Tiles Perforation – To achieve acoustics without deteriorating the aesthetical appeal of the control room it is necessary that the wall panelling shall have micro-perforations (less than 1.6mm diameter each) all over the surface with a density of 5000 holes per square feet. UL audit certified design feature on modular wall panelling tile having clean perforations and providing smooth finish on front fascia of tiles. The tile shall have 5000 holes per square feet on front side of the tile. Valid certificate/test report to be submitted along with the technical bid. 3) To provide acoustically superior environment and ensure proper attenuation of airborne sound, it is necessary that the sound transmission class (STC) value of wall panelling and partition shall be minimum 35 (According to IS: 9901 (Part III) – 1981, DIN 52210 Part I- 1984, ISO: 16283 (Part I) -2014. Valid certificate/test report to be submitted along with the technical bid. 4) The modular metal panelling shall comply to the lead-free directive to ensure restriction of hazardous substances so that the final product does not contaminate the environment. The final product i.e., modular metal panelling does not contain hazardous substances and we give a healthy life to our coming generations it is necessary that the modular metal panelling system shall be RoHS certified/tested (from UL / Intertek). Valid certificate/test report to be submitted along with the technical bid. 5) From fire safety point of view the metal wall panelling tiles shall be class A fire rated as per the norms of comparative measurements of surface flame spread and smoke density measurements with that of select grade red oak and fiber-cement board surfaces under the specific fire exposure conditions. The proposed wall panelling tiles shall be Class A certified/tested as per ASTM e84 (from UL/Intertek) for surface spread of flame and smoke generation. This is mandatory to ensure that the materials used in the interiors do not provoke fire. Valid certificate/test report to be submitted along with the technical bid. 6) Seismic safety of user & control room equipment is a prime concern area. The metal panelling shall sustain the seismic vibrations as per design spectrum IS 1893 for zone 4 or better vibrations. The test shall be carried out by authorized government agency. Valid certificate/test report to be submitted along with the technical bid. 7) The wall panelling shall be robust & strong enough to sustain the routine loads/minor impacts of typical control room environment. The wall panelling/partition structure shall have UL Audit certified feature of Load bearing capacity of 300 Kgs to hold any display unit on clamp having minimum length of 750mm. Valid certificate/test report to be submitted along with the technical bid. 8) As control room is a mission critical area and in an unlikely case of damage to the existing wall panelling tiles the same shall be replaceable within 20 seconds and thereby preventing loss of time of operators and ongoing operations. UL Audit certified feature of Modular wall panelling tile having secure locking arrangement for equidistant mounting. Locking arrangement enables easy replacement without using any tool within 20 seconds. The feature shall provide easy flexibility of locking all tiles in one column through gravity. Valid certificate/test report to be submitted along with the technical bid. 9) The panelling and partition system shall qualify fire rating of at least 45 minutes in accordance with BS 476 Part 20 & 22. Valid certificate/test report to be submitted along with the technical bid. 10) Structure shall be made from modular, heavy-duty powder coated CRCA frame (minimum sheet thickness 1mm) and shall allow uninterrupted flow of wires/cable/tubes of maximum diameter 25mm.	Sq Ft	496.00
2	Supply of Modular rigid PVC Metal Partition 1) The material of construction and technical specification shall remain the same as per modular rigid PVC metal panelling (Wall Finishing - modular rigid PVC metal panelling) however, In partition the cladding shall be done on either side of the section/grid work. Factory made removable type self inter lockable metal panels with front sheet of Preformed Textured Hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC Coating atleast 0.11mm). The back cover of the panel shall be made up of 0.6mm thick CRCA/GI sheet of approved colour. The panelling design shall comprise of specially designed combination of perforated and non-perforated panels through CNC laser Cutting, bending & punching. Panels shall be designed to achieve shape and design as per the design consultant and shall be fixed using GI/CRCA hook fitting on structure. The metal panelling/partition shall be greenguard gold tested/certified (from UL/Intertek). Valid certificate/test report to be submitted along with the technical bid. Overall system thickness for panelling shall be 60mm to 90mm and for partition shall be 70mm to 120mm.	Sq Ft	177.00
3	Supply of Printed Metal Panelling 1) The printed panelling shall have the same technical specifications as that of modular rigid PVC metal panelling (Wall Finishing - Sr No. 1 modular rigid PVC metal panelling). However, in addition to it, the front tile shall be digitally printed. Graphics shall be approved by the Customer. 2) Digital printing shall be done on modular metal Panelling. Pasting stickers/flex/vinyl on metal tile shall be deemed unacceptable. 3) The structure shall be made from a modular, heavy-duty powder-coated CRCA frame (minimum sheet thickness 1mm) and shall allow an uninterrupted flow of wires/cable/tubes of maximum diameter 25mm. 4) The structure shall be securely connected from wall, roof and floor. It shall be made up of a minimum of 1mm thick vertical slotted rolled C sections (Upright) and horizontal rolled 'C' connectors. Grid of the desired dimension shall be formed by Vertical and horizontal sections having 20 to 50mm pitch. 5) For Structure: - Powder coated CRCA steel sheet. (Sheet thickness minimum 1.0mm with powder coating).	Sq Ft	47.00

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4	Supply of Curve/Bend Modular Rigid PVC Metal Panelling 1) The material of construction and technical specification shall remain the same as per modular rigid PVC metal panelling (Wall Finishing - Sr No. 1 modular rigid PVC metal panelling) however, the shape shall be a perfect curve to provide more space for mounting of the LED. Panelling's curve shall be achieved by curved tiles only. Curvilinear arrangement using straight tiles shall be deemed unacceptable. Factory made removable type self inter lockable metal panels with front sheet of Preformed Textured Hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC Coating atleast 0.11mm). The back cover of the panel shall be made up of 0.6mm thick CRCA/GI sheet of approved colour. The panelling design shall comprise of specially designed combination of perforated and non-perforated panels through CNC laser Cutting, bending & punching. Panels shall be designed to achieve shape and design as per the design consultant and shall be fixed using GI/CRCA hook fitting on structure. Overall system thickness for panelling shall be 60mm to 90mm and for partition shall be 70mm to 120mm.	Sq Ft	170.00
5	Supply of 12mm Thick Frameless Tempered Clear Glass Door Size (±100mm) :- 1440mm X 2100mm With door spring and locking arrangements and both way handle and patch fittings. Specifications : Tempered glass is formed by heating glass to the softening point in a horizontal tempering stove, and then quickly cooling it. Properties: 1) Safety (tempered): when broken, it spits into tiny harmless pieces 2) Strong intensity: heat-strengthened glass is approximately twice as strong as annealed glass of the same thickness, and tempered glass is about 4 times 3) Outstanding performance in resisting thermal stress and wind-load 4) Tempered glass cannot be cut, drill hole and other further processed.	No.	2.00
6	Supply of Designer Acoustic Metal False Ceiling 1) Factory made acoustic modular metal false ceiling of powder coated panels. Make shall comprise of perforated and non-perforated metal panels made through CNC laser Cutting, bending & punching. Panel shall be of 0.6mm CRCA sheet of approved powder coating finish. Panels shall be designed to achieve shape and design as per the design consultant with the combination of acrylic panels with lights, designed to enhance visual feel, with provision for easy installation and maintenance, integrated lighting and scope for integration of building services like HVAC and fire detection/ fighting system. The designer metal ceiling shall be greenguard gold tested/certified (from UL/Intertek). Valid certificate/test report to be submitted along with the technical bid. Metal modular false ceiling shall have Noise absorption coefficient (NRC) value 0.60 according to IS:8225-1987, ISO: 354-1985 and ASTM 423-90. 2) It is well known that metal is resistant to fire as compared to wood & fabric. However, from fire and safety point of view, to ensure that the used material is not subjected to any kind of surface treatment which provokes fire. The proposed ceiling tiles shall be Class A certified as per ASTM e84 (from UL / Intertek) for surface spread of flame and smoke generation. This is mandatory to ensure that the materials used in the interiors do not provoke fire. Valid certificate/test report to be submitted along with the technical bid. 3) To ensure restriction of hazardous substances; so that the final product does not contaminate the environment and we give a healthy life to our coming generations it is necessary that the modular metal ceiling system shall be RoHS certified (from UL / Intertek). Valid certificate/test report to be submitted along with the technical bid. 4) To avoid dark spots/areas in the control room it is necessary that continuous linear lights are used across the width/length of the control room. UL audit certified design feature of integrated channel in ceiling for quick installation & replaceability of continuous linear light: The ceiling system having integrated inbuilt channel for installation of cove lights and shall permit quick and easy replacement of cove light without using any tools. Replacement to be carried out within 120 Seconds per meter. Valid certificate/test report to be submitted along with the technical bid. 5) Seismic safety of user & control room equipment is a prime concern area. The metal ceiling shall sustain the seismic vibrations as per design spectrum IS 1893 for zone 4 vibrations or better. The test shall be carried out by authorized government agency. Valid certificate/test report to be submitted along with the technical bid. 6) Structure shall be made from heavy duty powder coated CRCA steel sheet (minimum sheet thickness 0.8 to 1.6mm). It shall be securely grouted from roof with help of anchor fastener and GI self-threaded rods. It shall be formed with the help of slotted rolled W sections (stiffener) and Master C section with help of M6 cage nut and bolts.	Sq Ft	390.00
7	Supply of Designer Calcium Silicate Ceiling Plain Calcium Silicate Acoustic Boards for false ceiling with 08mm Approximately thick, Structure for underside of suspended grid formed of GI perimeter channels. Wood screws and metal expansion raw plugs for fixing with wall. Plastic emulsion paint of approved make and shade for finishing surface of Calcium Silicate Boards. Specification: Calcium Silicate Board is manufactured from a mixture of Portland cement, fine silica, special cellulose fibers and selected fillers to impart durability, toughness, fire and moisture resistance.	Sq Ft	174.00
8	Supply of Round LED Ceiling Light (Static) High performance LED downlighter with high system efficacy for good quality and uniform lighting. Conforms to general lighting norms for office and other indoor applications. 1) Colour Temperature (K)- 3000 K / 4000 K / 5700K (as per site conditions) 2) LED Efficacy (lm/W) – 100 to 160 3) CRI >70 4) Power Consumption 6W to 24W 5) LED's life >25,000 hours @ L70	No.	30.00

Annexure-I: Technical Specifications

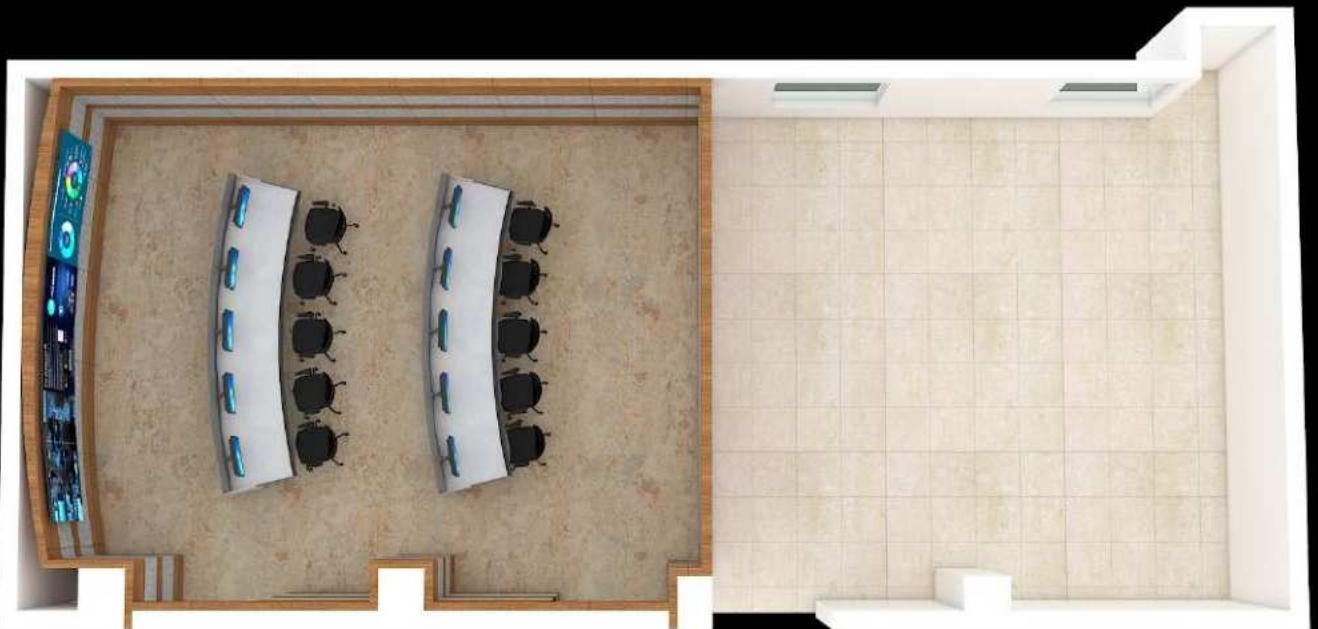
SOC Room Interior Technical Specification			
S.No	Detailed Description	Unit	Quantity
9	Supply of Cove light (Static) It will be a continuous rail of LED light, high brightness, neutral, or warm white with wall washing applications. Its slim profile and simple daisy-chain system allows high design flexibility to form long. 1) Light source: LED 2) Lumen output: 500 lm/m 3) Light color: 6500K 4) Power consumption: 3W/m to 5W/m 5) Operating Voltage Range (V) 100 – 300 6) Operating Frequency (Hz) 50 ± 3% 7) Colour: White 8) Lifetime: 15000 burning hrs. (At L70)	R/Ft	101.00
10	Supply of Wires, Switches & Conduits for Ceiling Lights Wires for ceiling lights inter looping and switches will be provided, consisting of PVC insulated copper conductor stranded flexible FRLS wires of 1100 volts grade of insulation in metallic conduits. Minimum size of copper conductor shall be 1.5 sq. mm for lighting and 2.5 sqmm for power. color of wires shall be Red/Yellow/Blue (or as per Local Standards) for the all single phases, Black for neutral and Green for earthing.	Sq Ft	537.00
11	Supply of Designer Acoustic Flooring To avoid distraction of operators because of unwanted noise generated from movement of chairs/people in the control room it is necessary that the proposed flooring shall damp such impact noises. Acoustic flooring (shall reduce impact sound by 14dB (ISO 717-2)). It shall be twinlayer linoleum built up from minimum 2mm acoustic laminate and a 2mm corkment backing. Flooring shall be decorative type of approved shade, pattern, texture and design and of approved manufacturer. The designer acosutic flooring shall be Greenguard Gold certified from (UL / Intertek). Valid certificate/test report to be submitted along with the technical bid. Dimensions shall be as per the final approved design and site requirement. Flooring shall be laid over concrete floor with laying compound strictly as per manufacturer's specification	Sq Ft	582.00
12	Supply of Granite Stone for Floor Highlighter/steps in required design and pattern, with 12mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) laid and joint with white cement slurry including pointing with white cement slurry admixed with pigment of matching shade as directed by the Engineer-in-Charge.	Sq Ft	52.00
13	Supply of CORPORATE LOGO	Lot	1.00
14	Supply of Designer Privacy Film for Glass Partition/Glass Door The film to be installed on clear glass to provide the look of sandblasted glass.	Sq Ft	47.00

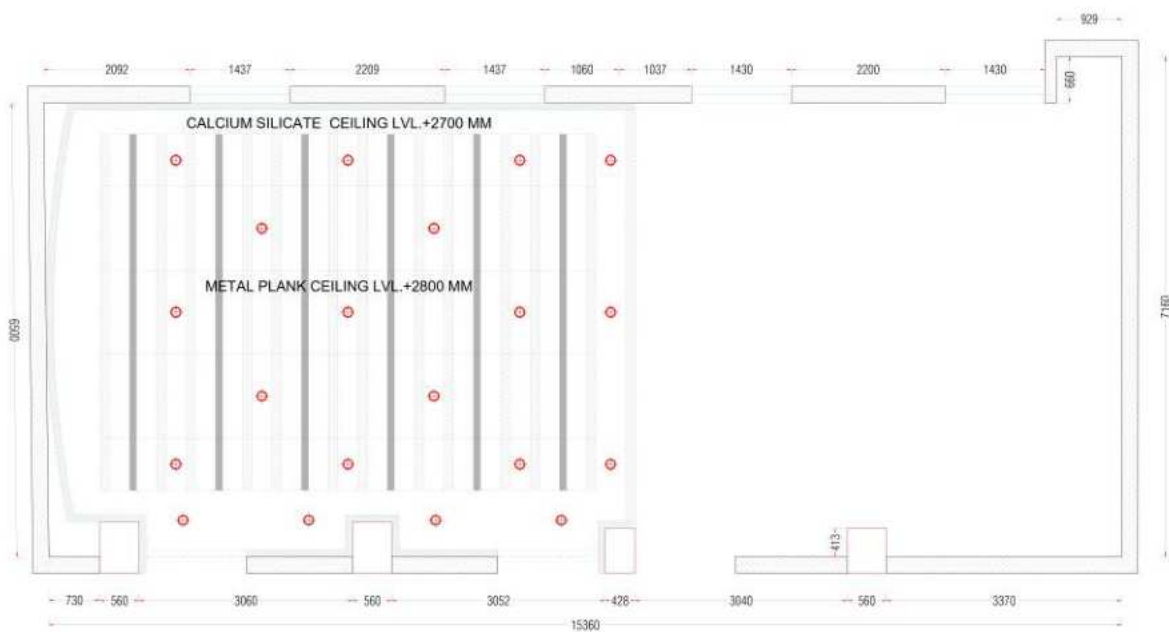
SOC Room Interior Technical Specification			
S.No	Detailed Description	Unit	Quantity
15	Supply of New Modular Control Desk for provision of 05 monitors & 05 Operators made in " XLAT " system. 1. Table top: - The material of the working surface shall be minimum 25 mm thick MDF with High Pressure ANSI/NEMA LD3 certified scratch-resistant laminate. The proposed console's life cycle shall be assessed (from approved LCA consultant) for environmental impacts associated with all the stages of a product's life for cradle to grave analysis. 2. Structure: Made of heavy duty extruded vertical and horizontal aluminium profiles of 6005 grade. The extrusions shall be duly powder coated with 40+ microns over all surfaces. All sheet metal parts shall be finished with a durable, black, electrostatic powder coating. To ensure that the offered product is an engineered solution. To allow future extension and expansion, a weld free system shall be proposed. Interconnecting joints shall not be visible. The structure shall be rigid enough to withstand BIFMA X5.5: 2014 tests. The structure shall allow easy assembly of hinged shutters, slat wall, gland plate, and monitor arms in extremely rigid manner. The EPD (Environmental product declaration) of console shall be verified in accordance with ISO 14025 (from UL/Intertek) for Impacts on Environment by console. Operator consoles shall be tested and qualified to sustain seismic vibrations as per design spectrum IS 1893 for zone 4 vibrations with monitor mounted on monitor arms of the control room console. Seismic test report of bare console shall be deemed unacceptable. Seismic safety of user & control room equipment is a prime concern area. This test shall be carried out by authorised government agency. 3. Slat Wall: - Slat Wall Shall be made of approximately 2mm thick extruded aluminium (HE9WP aluminium alloy). To safeguard the desired quality of the product it is necessary that the proposed console has been tested & verified on the set of rules governing the product range. The console shall be UL Listed. 4. Modular removable PU nosing: Front edge of consoles is the component which comes in frequent contact of the operator. The soft polyurethane edge is an ergonomic requirement as per ISO 11064 (International norms for Control Room Ergonomics) and is meant to prevent injury (accidental impact) to operator during emergency and it also reduces the contact stress. In case of damage to this edge the desk design shall permit quick & easy replacement within half an hour without taking any shutdowns or removal of the table tops. To ensure zero downtime because of such maintenance. Audit certified design feature of modular PU Edge. High density poly-urethane foam moulded on industrial grade aluminium core to form 50mm deep tapered edge to be installed on worktop. The edge shall be mechanically replaceable within 30 minutes, in case of damage or wear without opening or removing the worktop. Extruded PU edging/PVC T-beading shall be deemed unacceptable. 5. Monitor Arm: - The Console shall feature ergonomic display mounting arms. It shall enable quick & easy replacement of VESA mounts & arm extensions as per the ergonomic requirement defined in ISO 11064. UL audit certified design feature of monitor arm assembly shall have auto lock, push & remove feature for quick release of VESA mounts and modular arm extensions for ease in maintenance and fixing of monitor by one technician within 30 seconds without using any tools. 6. Shutters & Side Legs: - Front, back shutters shall be of 18 mm Laminated MDF Board with premium finish. Side leg shall be of 25mm of the same finish. Proposed console shall comply with the stringent/advanced version of BIFMA X7.1 standard. The console (open plan) shall not emit TVOC (A), Formaldehyde, i.e. 152 µg/m²*hr, 6.2 µg/m²*hr, respectively. This is to ensure healthier air quality for the operators. Proposed console shall be Greenguard Gold certified.	No.	2.00

SOC Room Interior Technical Specification			
S.No	Detailed Description	Unit	Quantity
16	Supply of New Modular Control Desk for provision of 01 monitor & 01 Operator made in " XLAT " system. 1. Table top: - The material of the working surface shall be minimum 25 mm thick MDF with High Pressure ANSI/NEMA LD3 certified scratch-resistant laminate. The proposed console's life cycle shall be assessed (from approved LCA consultant) for environmental impacts associated with all the stages of a product's life for cradle to grave analysis. 2. Structure: Made of heavy duty extruded vertical and horizontal aluminium profiles of 6005 grade. The extrusions shall be duly powder coated with 40+ microns over all surfaces. All sheet metal parts shall be finished with a durable, black, electrostatic powder coating. To ensure that the offered product is an engineered solution. To allow future extension and expansion, a weld free system shall be proposed. Interconnecting joints shall not be visible. The structure shall be rigid enough to withstand BIFMA X5.5: 2014 tests. The structure shall allow easy assembly of hinged shutters, slat wall, gland plate, and monitor arms in extremely rigid manner. The EPD (Environmental product declaration) of console shall be verified in accordance with ISO 14025 (from UL/Intertek) for Impacts on Environment by console. Operator consoles shall be tested and qualified to sustain seismic vibrations as per design spectrum IS 1893 for zone 4 vibrations with monitor mounted on monitor arms of the control room console. Seismic test report of bare console shall be deemed unacceptable. Seismic safety of user & control room equipment is a prime concern area. This test shall be carried out by authorised government agency. 3. Slat Wall: - Slat Wall Shall be made of approximately 2mm thick extruded aluminium (HE9WP aluminium alloy). To safeguard the desired quality of the product it is necessary that the proposed console has been tested & verified on the set of rules governing the product range. The console shall be UL Listed. 4. Modular removable PU nosing: Front edge of consoles is the component which comes in frequent contact of the operator. The soft polyurethane edge is an ergonomic requirement as per ISO 11064 (International norms for Control Room Ergonomics) and is meant to prevent injury (accidental impact) to operator during emergency and it also reduces the contact stress. In case of damage to this edge the desk design shall permit quick & easy replacement within half an hour without taking any shutdowns or removal of the table tops. To ensure zero downtime because of such maintenance. Audit certified design feature of modular PU Edge. High density poly-urethane foam moulded on industrial grade aluminium core to form 50mm deep tapered edge to be installed on worktop. The edge shall be mechanically replaceable within 30 minutes, in case of damage or wear without opening or removing the worktop. Extruded PU edging/PVC T-beading shall be deemed unacceptable. Operator Console (Forensic Lab) 5. Monitor Arm: - The Console shall feature ergonomic display mounting arms. It shall enable quick & easy replacement of VESA mounts & arm extensions as per the ergonomic requirement defined in ISO 11064. UL audit certified design feature of monitor arm assembly shall have auto lock, push & remove feature for quick release of VESA mounts and modular arm extensions for ease in maintenance and fixing of monitor by one technician within 30 seconds without using any tools. 6. Shutters & Side Legs: - Front, back shutters shall be of 18 mm Laminated MDF Board with premium finish. Side leg shall be of 25mm of the same finish. Proposed console shall comply with the stringent/advanced version of BIFMA X7.1 standard. The console (open plan) shall not emit TVOC (A), Formaldehyde, i.e. 152 µg/m²*hr, 6.2 µg/m²*hr, respectively. This is to ensure healthier air quality for the operators. Proposed console shall be Greenguard Gold certified.	No.	4.00
17	Supply of Chair 1. Synchro Mechanism: The 360° swivel along with Knee Tilt Synchro mechanism with three different tilt positions, supports healthy body movements and gives great back support. 2. Mesh Back: The back is made up of injection moulded glass filled nylon & upholstered using mesh fabric with high tenacity yarn giving the perfect balance between form, functionality and comfort. 3. Adjustable Armrest: The adjustable armrest structure is powder coated and comes with 8 step adjustability. Lumbar Support: Adjustable lumbar support is provided by upholstered polypropylene pad with moulded polyurethane foam.	No.	14.00
18	Scope of design 1. Detailed drawings, 2. Color options, 3. Design of ceiling, paneling & illumination of the control room	Lot	1.00
19	Project Management/Supervision Charges for Installation & Commissioning for Control Room Interior	Lot	1.00









LEGEND	
SYMBOL	NAME
	CALCIUM SILICATE CEILING
	METAL PLANK CEILING

TECHNICAL SPECIFICATION FOR CONTROL ROOM INTERIOR & CONTROL DESK

A. Scope of work

1. The purpose of this document is to define the specifications of control room interiors & consoles for control room project.
2. As the Control room is a significant place where critical operations/monitoring takes place, it is imperative that it is designed properly in terms of aesthetics, safety, ergonomics, and functionality. Various aspects shall be considered while designing control room area to create ideal workplace, considering physiological aspects such as line of sight and field of vision and cognitive factors such as concentration and perceptivity as per ISO 11064.
3. The scope of the project includes designing; engineering, supply & installation of 24X7 mission critical control centre interiors. Being a project of national repute this state-of-the-art control room interior facility & all its components like designer metal ceiling, flooring, modular rigid PVC metal panelling/partition, glass partitions, control desks, ceiling light & luminaire's electrical etc. shall look integrated and therefore it shall be treated as a part of one single solution i.e., Control Room Interior Solution. Main bidder to submit MAF (Manufacturer's Authorization Form) from Professional Control Room Interior Solution provider. To ensure an integrated solution, to qualify as per the international control room design & safety norms; main bidder shall bring one single professional control room interior solution provider on board with an experience of atleast twenty control rooms interiors along with control desks. Corresponding purchase orders/work orders and their appreciation/completion letters to be submitted along with the bid.
4. The Control Room Interior Solution Provider shall have experience of supplying below products in any one year out of last seven financial years to qualify: -
 - 4.1. Minimum 100 Sq. Meter of Greenguard Gold & RoHS (from UL/Intertek) Modular rigid PVC Metal Wall Panelling/Partition system supplied with ASTM e84 (from UL/Intertek) certified tiles.
 - 4.2. Minimum 100 Sq. Meter of Greenguard Gold & RoHS (from UL/Intertek) Modular Metal False Ceiling system supplied with ASTM e84 (from UL/Intertek) on tiles.
 - 4.3. Minimum 100 Sq. Meter of Greenguard Gold certified Acoustic laminate/carpet flooring.
 - 4.4. Minimum 10 Nos. of Greenguard Gold certified control desk modules along with modular removable Polyurethane Edge.
5. It is mandatory for the main bidder that the control room interior solution provider supplies all elements & executes all the activities at site like ceiling, flooring, control desks, panelling, partitions & illumination to avoid interface & quality related issues.
6. All the certificates and reports mentioned shall be submitted along with the technical bid and shall be valid on bid due date.
7. In broad, the scope of work and supply shall consist of the following parts.
 - 7.1. Interior Design, engineering of Control room.
 - 7.2. All related services for supply, installation & testing.
 - 7.3. Ergonomic compliance report as per ISO 11064.

8. Mandatory Requirement & Submittals

- 8.1. The project demands for a contemporary, aesthetically appealing, ergonomically designed, safe and 24X7 working facility. Conventional wooden cladding, Gypsum, Aluminium composite panels, Laminates, Fabric, Paint, Plaster of Paris (for Control room area) are prone to damages & ageing. These components shall not be used to ensure maintenance free working environment. Control room interior solution provider to submit an undertaking on letterhead to comply the same.
- 8.2. Illumination: - Control room illumination shall be designed as per ISO 11064 norms.

8.3. **Design Criteria**

8.3.1. The metal ceiling, metal panelling and partition shall be of modular design, facilitating future equipment retrofits and full reconfigurations without requiring any major modification to the structure.

8.4. **Quality Criteria**

8.4.1. The critical components of the control room i.e., designer metal ceiling, modular metal wall panelling/partitions shall not emit formaldehydes, TVOC beyond permissible limits i.e. $9 \mu\text{g}/\text{m}^3$, $0.22 \text{ mg}/\text{m}^3$ respectively. This is to ensure healthier air quality for the operators. Therefore, the control room interior shall be Greenguard gold certified (Modular metal ceiling, Acoustic Flooring & Modular metal wall panelling) from UL / Intertek. Valid certificate/report to be submitted.

8.4.2. The proposed console shall be Greenguard Gold certified. The OEM shall have had this certificate for at-least five years prior to April 1st, 2023. Valid certificates shall be submitted along with bid.

B. Technical Specification of Command Control Room Interior and Console

1. Modular rigid PVC metal panelling



1.1 Factory made removable type self inter lockable metal panels with front sheet of preformed textured hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC coating atleast 0.11mm). The back cover of the panel shall be made up of 0.6mm thick CRCA/GI sheet of approved colour. The panelling design shall comprise of specially designed combination of perforated and non-perforated panels through CNC laser cutting, bending & punching. Panels shall be designed to achieve shape and design as per the design consultant and shall be fixed using GI/CRCA hook fitting on structure. The metal panelling/partition shall be Greenguard Gold Certified from (UL / Intertek). Valid certificate / test report to be submitted along with the technical bid. Overall system thickness for panelling shall be 60mm to 90mm and for partition shall be 70mm to 120mm.

1.2 Panel shall comprise of perforation for making the cladding and partitions acoustically sound.

1.3 Tiles Perforation – To achieve acoustics without deteriorating the aesthetical appeal of the control room it is necessary that the wall panelling shall have micro-perforations (less than

- 1.6mm diameter each) all over the surface with a density of 5000 holes per square feet. UL audit certified design feature on modular wall panelling tile having clean perforations and providing smooth finish on front fascia of tiles. The tile shall have 5000 holes per square feet on front side of the tile. Valid UL audit certificate to be submitted along with the technical bid.
- 1.4 There shall be possibility of wide variety of colours and images to be used on the wall elements to give the aesthetic and state of the art look to the control room interior.
- 1.5 Panel design to support proper integration of large video screen.
- 1.6 Gluing, screwing, ACP (Aluminium composite panels), Paint, Gypsum, Fabric, Wooden laminates shall be deemed unacceptable in control room interior.
- 1.7 Structure shall allow uninterrupted flow of wires/cable/tubes of maximum diameter 25mm.
- 1.8 Panel shall be designed in such a manner that it takes care of undulation of walls and gives perfect flat surface finish and compile easy service & maintenance procedure.
- 1.9 To provide acoustically superior environment and ensure proper attenuation of airborne sound, it is necessary that the sound transmission class (STC) value of wall panelling and partition shall be minimum 40 (According to IS: 9901 (Part III) – 1981, DIN 52210 Part I- 1989, ISO: 16283 (Part I) -2014, test report to be submitted along with the technical bid.
- 1.10 The modular metal panelling shall comply to the lead-free directive to ensure restriction of hazardous substances so that the final product does not contaminate the environment. The final product i.e., modular metal panelling does not contain hazardous substances and we give a healthy life to our coming generations it is necessary that the modular metal panelling system shall be RoHS certified (from UL / Intertek). Valid certificate/test report to be submitted along with the technical bid.
- 1.11 From fire safety point of view the metal wall panelling tiles shall be class A fire rated as per the norms of comparative measurements of surface flame spread and smoke density measurements with that of select grade red oak and fiber-cement board surfaces under the specific fire exposure conditions. The proposed wall panelling tiles shall be Class A certified as per ASTM e84 (from UL/Intertek) for surface spread of flame and smoke generation. This is mandatory to ensure that the materials used in the interiors do not provoke fire. Valid certificate/test report to be submitted along with the technical bid.
- 1.12 Seismic safety of user & control room equipment is a prime concern area. The metal panelling shall sustain the seismic vibrations as per design spectrum IS 1893 for zone 4 or better vibrations. The test shall be carried out by authorized government agency. Test Report to be submitted along with the technical bid.
- 1.13 The wall panelling shall be robust & strong enough to sustain the routine loads/minor impacts of typical control room environment. The wall panelling/partition structure shall have UL audit certified feature of Load bearing capacity of 300 Kgs to hold any display unit on clamp having minimum length of 750mm. Valid UL audit certificate to be submitted along with the technical bid.
- 1.14 The panelling and partition system shall qualify fire rating of at least 120 minutes in accordance with BS 476 Part 20 & 22. Valid certificate/test report to be submitted along with the technical bid.
- 1.15 As control room is a mission critical area and in an unlikely case of damage to the existing wall panelling tiles the same shall be replaceable within 20 seconds and thereby preventing loss of time of operators and ongoing operations. UL audit certified feature of modular wall panelling tile having secure locking arrangement for equidistant mounting. Locking arrangement enables easy replacement without using any tool within 20 seconds. The feature shall provide easy flexibility of locking all tiles in one column through gravity. Valid UL audit certificate to be submitted along with the technical bid.
- 1.16 Design
- 1.16.1 The cladding panels shall be made up of combination of two sheets locked and riveted together and polystyrene shall be used as infill to achieve strength and acoustics. The front

- tile (PVC pre-coated metal sheet) shall be perforated/ non-perforated as per the design requirement and the back tile (Powder coated 0.6mm CRCA steel sheet and powder coating thickness 0.06mm to 0.09mm) shall be designed in such a manner that it fits on the back portion of the front tile. Once the tiles are assembled then these will be riveted. These tiles shall be bent through CNC, machine punched & laser cut to achieve perfect accuracy.
- 1.16.2 Structure shall be made from modular, heavy-duty powder coated CRCA frame (minimum sheet thickness 1mm) and shall allow uninterrupted flow of wires/cable/tubes of maximum diameter 25mm.
- 1.16.3 Structure shall be securely connected from wall, roof and floor. It shall be made up of minimum 1mm thick vertical slotted rolled C sections (Upright) and horizontal rolled 'C' connectors. Grid of desired dimension shall be formed by vertical and horizontal sections having 20 to 50mm pitch.
- 1.17 Surface Finish
- 1.17.1 For panels
- 1.17.1.1 Front Panel: PVC pre-coated GI sheet (sheet thickness: 0.6mm and PVC coating: atleast 0.11mm)
- 1.17.1.2 Back Cover: Powder coated CRCA steel sheet. (sheet thickness: 0.6mm)
- 1.17.2 Rigid PVC / Panel material shall provide better thermal and electrical insulation. It shall be non-reflective/glare free and be eligible for food contact.
- 1.17.3 For Structure
- 1.17.3.1 Powder coated CRCA steel sheet. (sheet thickness minimum 1.0mm with powder coating)
- 1.17.3.2 The metal sheet shall have possibility of being formed mechanically per the specific needs of the project.
- 1.18 Material Selection
- 1.18.1 Available Width- 100mm to 1200mm (in multiples of 100 & 150mm).
- 1.18.2 Available Height- 100mm to 750mm (in multiples of 100 & 150mm).
- 1.18.3 Thickness- minimum 10mm for perforated tiles with acoustic fleece without back cover.
- 1.18.4 Minimum 25mm for perforated/non-perforated tiles with back covers.
- 1.19 Material Testing/Certification: (Certificate to be submitted along with the technical bid)
- 1.19.1 PVC pre-coated sheet:
- 1.19.1.1 Fire rating and Low flame spread: EN ISO 11925-2, EN 13823 and ASTM e-84
- 1.19.2 Powder coating
- 1.19.2.1 Adhesion test: EN ISO 2409 / ASTM: D 3359
- 1.19.2.2 Impact resistance test: ASTM D 2794 (5/9' ball)
- 1.19.2.3 Conical mandrel test: ASTM D522
- 1.19.2.4 Salt spray test: 1000 hours as per ASTM B117
- 1.19.2.5 Resistance to humid atmosphere test as per ISO 6270
- 1.20 Component Specification
- 1.20.1 Floor Mounting
- 1.20.1.1 'I' section made from pre-welded of minimum 2mm thick C channels; having minimum height of 150mm. This I section shall be firmly weld on 3mm thick grouting plate.
- 1.20.1.2 This assembly shall be grouted on the false floor with the help of M8/10 anchor fasteners.
- 1.20.1.3 These floor mountings shall be the base support to the vertical uprights spaced at a center-to-center distance of 1200mm maximum.
- 1.20.1.4 Bidder shall ensure proper marking and levelling before proceeding with any floor grouting.
- 1.20.2 C Section (Upright) fixing

- 1.20.2.1 58mm wide slotted rolled C section (UPRIGHT) (1 to 1.6 mm thick CRCA steel sheet). Maximum single piece length shall not exceed 2450mm.
- 1.20.2.2 All sections will be dual slotted with 20 to 50 mm pitch.
- 1.20.2.3 These uprights shall be mounted over the floor mountings and shall be connected by C connectors made up of 1.0mm to 1.6mm thick CRCA steel sheet 'C' sections.
- 1.20.2.4 The installation to be carried out with Uprights spaced at 1200 mm (center to center) securely fixed to the false floor by means floor mountings.
- 1.20.2.5 The uprights shall be firmly held with L-shaped wall mounts made up of minimum 1.6mm thick CRCA steel sheet duly powder coated.
- 1.20.2.6 The L clamp and the upright will be bolted together with M6 bolts
- 1.20.3 End Cap
- 1.20.3.1 0.75mm thick PVC coated GI tile; (similar to panel tile) shall be bolted on the extreme end-uprights, corners to hide the grid structure.
- 1.21 Panel
- 1.21.1 The panels shall be hooked on the uprights.
- 1.21.2 Panels shall have metal hooks.
- 1.21.3 The hooks of the panels shall have a length of minimum 90mm (for the upper hook) and 80mm (for the bottom hook). So that these panels are firmly held on the uprights.
- 1.21.4 The panel shall have hook in arrangement (With gravity lock).
- 1.22 Door Profile
- 1.22.1 Door frame shall be fixed with these profiles only to have proper integration of doors with the overall system.
- 1.23 Feature
- 1.23.1 Raw material for tile & powder coating shall not affect environment.
- 1.23.2 No sagging.
- 1.23.3 Easy and quick installation.
- 1.23.4 Low cleaning effort.
- 1.23.5 Vendor to demonstrate one portion at wall panelling & ceiling at their premises before dismantling & shipping to site. In short, a FAT (Factory acceptance test) to be carried out at vendors works for ceiling & panelling.
- 1.23.6 100 % modular design. At site, no cutting, chipping work is allowed.
- 1.23.7 The tile shall be bend resistant.

2. Modular rigid PVC metal partition

- 2.1 The material of construction and technical specification shall remain the same as per modular rigid PVC metal panelling (wall finishing - modular rigid PVC metal panelling) however, in partition the cladding shall be done on either side of the section/grid work.
- 2.2 Factory made removable type self inter lockable metal panels with front sheet of preformed textured hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC coating atleast 0.11mm). The back cover of the panel shall be made up of 0.6mm thick CRCA/GI sheet of approved colour. The panelling design shall comprise of specially designed combination of perforated and non-perforated panels through CNC laser cutting, bending & punching. Panels shall be designed to achieve shape and design as per the design consultant and shall be fixed using GI/CRCA hook fitting on structure. The metal panelling/partition shall be Greenguard Gold Certified from (UL / Intertek). Valid certificate / test report to be submitted along with the technical bid. Overall system thickness for panelling shall be 60mm to 90mm and for partition shall be 70mm to 120mm.

3. **Curve/Bend modular rigid PVC metal panelling**



3.1 The material of construction and technical specification shall remain the same as per modular rigid PVC metal panelling (wall finishing - Sr No. 1 modular rigid PVC metal panelling) however, the shape shall be a perfect curve to provide more space for mounting of the LED. Panelling's curve shall be achieved by curved tiles only. Curvilinear arrangement using straight tiles shall be deemed unacceptable. In panelling the cladding shall be done on single side of the section/grid work.

3.2 Factory made removable type self inter lockable metal panels with front sheet of preformed textured hot dip galvanized sheet with rigid polyvinylchloride (PVC) film on one side and on the other side a coating to avoid rust (sheet thickness 0.6mm & PVC coating atleast 0.11mm). The back cover of the panel shall be made up of 0.6mm thick CRCA/GI sheet of approved colour. The panelling design shall comprise of specially designed combination of perforated and non-perforated panels through CNC laser cutting, bending & punching. Panels shall be designed to achieve shape and design as per the design consultant and shall be fixed using GI/CRCA hook fitting on structure. The metal panelling/partition shall be Greenguard Gold Certified from (UL / Intertek). Valid certificate / test report to be submitted along with the technical bid. Overall system thickness for panelling shall be 60mm to 90mm and for partition shall be 70mm to 120mm.

4. **Printed Metal Panelling**



4.1 The printed panelling shall have the same technical specifications as that of modular rigid PVC metal panelling (Wall Finishing - Modular rigid PVC metal panelling). However, in addition to it, the front tile shall be digitally printed. Graphics shall be approved by the Customer.

4.2 Digital printing shall be done on modular metal Panelling. Pasting stickers/flex/vinyl on metal tile shall be deemed unacceptable.

- 4.3 The structure shall be made from a modular, heavy-duty powder-coated CRCA frame (minimum sheet thickness 1mm) and shall allow an uninterrupted flow of wires/cable/tubes of maximum diameter 25mm.
- 4.4 The structure shall be securely connected from wall, roof and floor. It shall be made up of a minimum of 1mm thick vertical slotted rolled C sections (Upright) and horizontal rolled 'C' connectors. Grid of the desired dimension shall be formed by Vertical and horizontal sections having 20 to 50mm pitch.
- 4.5 For Structure: - Powder coated CRCA steel sheet. (Sheet thickness minimum 1.0mm with powder coating).

5. Doors

- 5.1 **12mm thick Frameless tempered clear glass door with fittings (Single / Double Doors):**
- With door spring and locking arrangements and both way handle and patch fittings.

6. Ceiling

- 6.1 **Designer Acoustic Metal False ceiling with Planks**



- 6.1.1 Factory made acoustic modular metal false ceiling of powder coated panels. Make shall comprise of perforated and non-perforated metal panels made through CNC laser Cutting, bending & punching. Panel shall be of 0.6mm CRCA sheet of approved powder coating finish. Panels shall be designed to achieve shape and design as per the design consultant with the combination of acrylic panels with lights, designed to enhance visual feel, with provision for easy installation and maintenance, integrated lighting, and scope for integration of building services like HVAC and fire detection/ fighting system. The designer metal ceiling shall be Greenguard Gold certified from (UL / Intertek). Valid certificate / test report to be submitted along with the technical bid.
- 6.1.2 Metal modular false ceiling shall have noise absorption coefficient (NRC) value 0.60 according to IS:8225-1987, ISO: 354-1985 and ASTM 423-90. Test report to be submitted along with the technical bid.
- 6.1.3 It is well known that metal is resistant to fire as compared to wood & fabric. However, from fire and safety point of view, to ensure that the used material is not subjected to any kind of surface treatment which provokes fire. The proposed ceiling tiles shall be Class A certified as per ASTM e84 (from UL / Intertek) for surface spread of flame and smoke generation. This is mandatory to ensure that the materials used in the interiors do not provoke fire. Valid certificate/report to be submitted along with the technical bid.
- 6.1.4 To ensure restriction of hazardous substances; so that the final product does not contaminate the environment and we give a healthy life to our coming generations it is necessary that the modular metal ceiling system shall be RoHS certified (from UL / Intertek). Valid certificate/report to be submitted along with the technical bid.
- 6.1.5 To avoid dark spots/areas in the control room it is necessary that continuous linear lights are used across the width/length of the control room. UL audit certified design feature of integrated channel in ceiling for quick installation & replaceability of continuous linear light: The ceiling system having integrated inbuilt channel for installation of cove lights and shall permit quick

and easy replacement of cove light without using any tools. Replacement to be carried out within 120 Seconds per meter. Valid UL audit certificate to be submitted along with the technical bid.

- 6.1.6 Seismic safety of user & control room equipment is a prime concern area. The metal ceiling shall sustain the seismic vibrations as per design spectrum IS 1893 for zone 4 vibrations or better. The test shall be carried out by authorized government agency. Valid test report to be submitted along with the technical bid.
- 6.1.7 Structure shall be made from heavy duty powder coated CRCA steel sheet (minimum sheet thickness 0.8 to 1.6mm). It shall be securely grouted from roof with help of anchor fastener and GI self-threaded rods. It shall be formed with the help of slotted rolled W sections (stiffener) and Master C section with help of M6 cage nut and bolts.
- 6.1.8 Panels are then fitted on hook system individually on the grid framework. The panels are also hold by safety wire to ensure that these tiles do not fall during seismic vibrations.
- 6.1.9 The ceiling system shall have double safety system to take care of seismic vibrations.
- 6.1.10 The ceiling planks shall have locked redundancy to enhance seismic impact resistance.
- 6.1.11 The powder coated metal sheet shall have possibility of being formed mechanically per the specific needs of the project. The powder coating shall be able to undergo stretching up to 100% and therefor follow (adhere to) bend with the steel in all its deformation.
- 6.1.12 The master section shall have laser cut profile to enable fixing of perforated, non-Perforated & diffused continuous LED section with acrylic sheet.
- 6.1.13 Dimensional Details
- 6.1.13.1 Non- Perforated Tile: - Machine profiled CRCA Steel sheet of 290mm (Wide) available in various length of 600mm to 1800mm in multiple of 300mm.
- 6.1.13.2 Perforated Tile: - Machine profiled CRCA Steel sheet with fleece of 146mm (Wide) in various length of 600mm to 1800mm in multiple of 300mm.
- 6.1.13.3 Type- Hook on with double locking arrangements. (Key requirement). Shall be easily openable to access above ceiling services. Special connection joineries to take care of seismic vibration.
- 6.1.14 Material Testing/Certification
- 6.1.14.1 Powder coating: shall qualify 1000 hours' salt spray test.
- 6.1.15 Component Specification
- 6.1.15.1 Master Section
- 6.1.15.1.1 1.2mm thick CRCA steel sheet section length 1200mm. the installation to be carried out with runner's spaces at 1200/1500/2100mm center to center securely fixed to the hanging W section by means at M6 Nut and bolts.
- 6.1.15.2 Hanging W Section
- 6.1.15.2.1 Specially machine profiled W section 65x15x0.8mm.the section shall be 2400 mm long & shall run across the length at the room.
- 6.1.15.2.2 Centre to Centre distance between W section shall be 1000mm.
- 6.1.15.2.3 These sections are securely fixed to the slab by means of Metal fastener and 08mm GI rod fully threaded (with hex nut for precision level adjustment)
- 6.1.15.2.4 The two-master section shall be attached to each other by means at fixing plate 45x34mm & M6 cage nut & bolts.
- 6.1.15.3 U Section
- 6.1.15.3.1 Machine profiled 'U' Section 150x77x0.6mm section to accommodate continuous running light.
- 6.1.15.3.2 It shall have provision for fixing acrylic sheet.
- 6.1.15.3.3 This whole assembly shall be hung from roof slab with help of anchor fastener and full threaded GI rod.
- 6.1.16 Ceiling Plank

- 6.1.16.1 It shall have Laser cut holes/cut-outs for light fixing as per defined lux requirement and approved layout.
- 6.1.16.2 Non-perforated tile slots to be punched to accommodate AC grills.

6.2 **Designer calcium silicate ceiling**

- 6.2.1.1 Plain calcium silicate acoustic boards for false ceiling with 08mm approximately thick, Structure for underside of suspended grid formed of GI perimeter channels. Wood screws and metal expansion raw plugs for fixing with wall. Plastic emulsion paint of approved make and shade for finishing surface of Calcium Silicate Boards. Specification: Calcium Silicate Board is manufactured from a mixture of Portland cement, fine silica, special cellulose fibres and selected fillers to impart durability, toughness, fire and moisture resistance.

7. **Lighting and Illumination (Static)**

7.1 **LED lights**

- 7.1.1 Brief: - The lights shall be available in flat panels. These shall be designed and developed with slim shape for stylish look. The product shall have better colour rendering index for interior illumination.
- 7.1.2 The LED shall have three basic choices of colours like cool white / warm white / neutral white. The LED lights shall have uniform light distribution without any spots on surface of panel, to make it highly luminous.

- 7.2 **Round LED Lights:** - High performance LED downlighter with high system efficacy for good quality and uniform lighting. Conforms to general lighting norms for office and other indoor applications.

- 7.2.1 Colour Temperature (K)- 3000 K / 4000 K / 5700K

- 7.2.2 LED Efficacy (lm/W) – 100 to 160

- 7.2.3 CRI >70

- 7.2.4 Power Consumption 6W to 24W

- 7.2.5 LED's life >25,000 hours @ L70

- 7.3 **LED based Strip Light for Ceiling:** - It will be a continuous rail of LED light, high brightness, neutral, or warm white with wall washing applications. Its slim profile and simple daisy-chain system allows high design flexibility to form long.

- 7.3.1 Light source: LED

- 7.3.2 Lumen output: 500 lm/m

- 7.3.3 Light color: 6500K

- 7.3.4 Power consumption: 3W/m to 5W/m

- 7.3.5 Operating Voltage Range (V) 100 – 300

- 7.3.6 Operating Frequency (Hz) 50 ± 3%

- 7.3.7 Colour: White

- 7.3.8 Lifetime: 15000 burning hrs. (At L70)

7.4 **Wiring for ceiling lights**

- 7.4.1 For ceiling wiring inter looping will be done and switches will be provided

- 7.4.2 The system of wiring shall consist of PVC insulated copper conductor stranded flexible FRLS wires of 1100 volts grade of insulation, in metallic conduits for all exposed wiring and PVC/ metallic conduits for all concealed wiring. Minimum size of copper conductor shall be 1.5 sq. mm for lighting and 2.5 sqmm for power. Colour code shall be maintained for the entire wiring installation that is Red/Yellow/Blue (or as per Local Standards) for the all-single phases, Black for neutral and Green for earthing.

- 7.4.3 Appropriate ferrule will be used in both the side (LDB Side & Switch's Side).

- 7.4.4 Note – Each Light Fixture will have 3 Wires: Phase, Neutral & Earth individually.

- 7.5 **Switches and Sockets**
- 7.5.1 Compliance to stringent quality norms, Dual shutter mechanism for easy & better fitment Wide & flat switch knob for easy operation. FR grade polycarbonate with high impact resistance, shock proof & UV rays stabilized.
- 7.6 **MCBs**
- 7.6.1 For the control and protection of low voltage installations against overload and short circuits.
- 7.6.2 Ripping characteristic: C Curve – 5 to 10 x In
- 7.6.3 Rated at 25°C to -50°C
- 7.6.4 Isolation function
- 7.6.5 Double entry points, separate bus bar entry, open mouthed terminal and lift clamps.
8. **Flooring**
- 8.1 **Designer Acoustic Flooring**
- 8.1.1 To avoid distraction of operators because of unwanted noise generated from movement of chairs/people in the control room it is necessary that the proposed flooring shall damp such impact noises. Acoustic flooring (shall reduce impact sound by 14dB (ISO 717-2)). It shall be twin-layer linoleum built up from minimum 2mm acoustic laminate and a 2mm corkment backing. Flooring shall be decorative type of approved shade, pattern, texture and design and of approved manufacturer. Dimensions shall be as per the final approved design and site requirement. The designer acoustic flooring shall be Greenguard Gold Certified from (UL / Intertek). Valid certificate / test report to be submitted along with the technical bid. Flooring shall be laid over concrete floor with laying compound strictly as per manufacturer's specification.
- 8.2 **Granite Stone for floor Highlighter/steps** in required design and pattern, with 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) laid and joint with white cement slurry including pointing with white cement slurry admixed with pigment of matching shade as directed by the Engineer-in-Charge.
9. **Miscellaneous Items**
- 9.1 **Designer privacy film for glass partitions & glass doors**
- 9.1.1 The film to be installed on clear glass to provide the look of sandblasted glass.
10. **Control Desk**
- 10.1 Technical Specifications: - The Control Desk shall conform to high standard of engineering as mentioned in the document; meeting the specified codes, standards and designs. It shall be capable of performing 24X7 operations under the specified environmental condition in compliance to control room ergonomic norms i.e. ISO 11064. All the certificates and reports mentioned below and in BOQ shall be submitted along with the technical bid.
- 10.2 Structure: -
- 10.2.1 Made of heavy-duty extruded vertical and horizontal aluminium profiles. The extrusions shall be duly powder coated with 40+ microns over all surfaces. All sheet metal parts shall be finished with a durable, black, electrostatic powder coating. OEM shall have a valid trademark registration certificate issued by the Government of India for the Control Desk proposed in this tender. Valid Trademark registration certificate to be submitted along with the technical bid.
- 10.2.2 The proposed control desk/Workstation shall satisfy the dimensional requirements of BS EN ISO 11064: 2013; Ergonomic design of control centers – Part 4: Layout and dimensions of workstations. Valid Ergonomic test certificate from UL/FIRA to be submitted along with the bid.

- 10.2.3 To allow future extension and expansion, a weld-free system shall be proposed. Interconnecting joints shall not be visible. The structure shall be rigid enough to withstand BIFMA X5.5 tests. OEM shall have had BIFMA X5.5 certificate for at least five years prior to April 1st, 2023. The structure shall allow easy assembly of hinged shutters, slat wall, gland plate, and monitor arms in extremely rigid manner. Valid certificate of BIFMA X5.5 from authorized agencies to be submitted along with technical Bid.
- 10.2.4 The EPD (Environmental product declaration) of Control Desk shall be verified in accordance with ISO 14025 (from UL/Intertek) for Impacts on Environment by Control Desk. Valid report/document from UL/Intertek to be submitted along with the technical bid.
- 10.3 Table top: - The material of the working surface shall be minimum 25 mm thick MDF with High-Pressure laminate. The proposed Control Desk's life cycle should be assessed (from approved LCA consultant) for environmental impacts associated with all the stages of a product's life for cradle to grave analysis. Valid report/document from UL/Intertek to be submitted along with the technical bid.
- 10.4 Slat Wall: - Slat wall shall be made of approximately 2mm thick extruded aluminium (aluminium alloy). The proposed Control Desk shall be UL Listed and valid certificate to be submitted along with the technical bid.
- 10.5 Modular removable PU nosing: The front edge of consoles is the component which comes in frequent contact of the operator. The soft polyurethane edge is meant to prevent injury (accidental impact) to operator during emergency and it also reduces the contact stress. In case of damage to this edge the desk design shall permit quick & easy replacement within half an hour without taking any shutdowns or removal of the tabletops. Audit certified design feature of modular PU Edge: High-density poly-urethane moulded on industrial grade aluminium core to form 50mm deep tapered edge to be installed on worktop. In case of damage or wear, the edge shall be mechanically replaceable within 30 minutes without opening or removing the worktop. Valid UL audit certificate to be submitted along with the technical bid. Extruded PU edging/PVC T-beading shall be deemed unacceptable.
- 10.6 Monitor Arm: - The Console shall feature ergonomic display mounting arms. It shall enable quick & easy replacement of VESA mounts & arm extensions as per the ergonomic. UL audit certified design feature of monitor arm assembly shall have auto lock, push & remove feature for quick release of VESA mounts and modular arm extensions for ease in maintenance and fixing of monitor by one technician within 30 seconds without using any tools. Valid UL audit certificates to be submitted along with the technical bid.
- 10.7 The proposed control desk shall be ANSI/BIFMA e3-2019 certified/tested at least for level 3 from UL/Intertek as per Furniture Sustainability Standard to identify the sustainability level of the furniture with respect to the environmental, health & wellness, and social impacts applicable to product(s). Valid certificate to be submitted along with the technical bid.
- 10.8 Shutters & Side Legs: - Front, and back shutters shall be of 18 mm Laminated MDF Board with premium finish. Side leg shall be of 25mm of the same finish. The side leg shall feature of illuminated strip on the periphery. The proposed console shall be Greenguard Gold certified. OEM shall have had this certificate for at-least five years prior to April 1st, 2023.
- 10.9 Cable Trays and Wiring: - The Console shall be designed with vertical and horizontal cable trays to allow for continuous cable management between the cabinets. Wire shall be routed into the cabinet through gland plate. The proposed console shall be RoHS Certified/tested

from UL/Intertek and the valid certificate/ test report shall be submitted along with the technical bid.

10.10

Hardware: - All bolts shall be of SS material to avoid rust due to environment. The remaining hardware shall be Nickel Plated MS.