

BIDDING DOCUMENT

FOR

“TURNKEY SOLUTION FOR SUPPLY, INSTALLATION, COMMISSIONING, TESTING, ACTIVE & PASSIVE COMPONENTS FOR SETTING-UP OF VIDEO CONFERENCING SYSTEM WITH FIVE (5) YEARS OF COMPREHENSIVE WARRANTY AT COMMUNICATION AND NETWORK MANAGEMENT CENTRE (CNMC) AND 15 OTHER AEGCL SITES ALONG WITH TURNKEY CONSTRUCTION OF 15 SEATER CONFERENCE ROOM AT CNMC, KAHILIPARA AS PER TECHNICAL SPECIFICATION”



(E-Tender)

<https://assamtenders.gov.in>

VOLUME-2

**TECHNICAL SPECIFICATION
(Employer's Requirements)**

BID IDENTIFICATION NO:
AEGCL/MD/VIDEO CONFERENCING/COMM/2019/02(R)

**ASSAM ELECTRICITY GRID
CORPORATION LIMITED**

TECHNICAL SPECIFICATION

CONTENTS

SECTION-1	SCOPE AND GENERAL TECHNICAL CONDITIONS	7
1.1.0	INTENT OF THE SPECIFICATION	
1.2.0	SCOPE	
1.3.0	CONTRACTOR TO INFORM HIMSELF FULLY	
1.4.0	SERVICE CONDITIONS	
1.5.0	STANDARDS	
1.6.0	ENGINEERING DATA	
1.7.0	FINAL DRAWINGS AND DOCUMENTS	
1.8.0	APPLICATION AND SYSTEM SOFTWARE	
1.9.0	DESIGN IMPROVEMENTS	
1.10.0	DESIGN CO-ORDINATION	
1.11.0	EMPLOYER'S SUPERVISION	
1.12.0	INSPECTION & INSPECTION CERTIFICATE	
1.13.0	GUARANTEED TECHNICAL PARTICULARS	
1.14.0	PACKING	
1.15.0	CONSTRUCTION TOOLS, EQUIPMENTS ETC.	
1.16.0	MATERIALS HANDLING AND STORAGE	
1.17.0	CONTRACTOR'S MATERIALS BROUGHT ON TO SITE	
1.18.0	COMMISSIONING SPARES	
ANNEXURE-I	SCHEDULE OF QUANTITY FOR VIDEO CONFERNING SYSTEM (SUPPLY, ERECTION, TESTING AND COMMISSIONING)	14
SECTION-2	DETAILED TECHNICAL SPECIFICATIONS	16
SECTION-3	DRAWINGS	51

SECTION-1

SCOPE AND GENERAL TECHNICAL CONDITIONS

1.1.0 INTENT OF THE SPECIFICATION

1.1.1 This volume of the specification deals with the general technical information & criteria for design, manufacture, supply, erection, testing & commissioning and setting to work of construction of Video Conferencing System on "Design, Supply and Install" basis as defined in Volume-1.

1.1.2 The provisions of this section shall supplement all the detailed Technical Specifications and requirements brought out herein. The Contractor's proposal shall be based on the use of materials complying fully with the requirements specified herein.

1.2.0 SCOPE:

The following shall include the scope of works:-

- (a) Supply, installation, commissioning, testing, active & passive components for setting-up of video conferencing system with five (5) years of comprehensive warranty.
- (b) Construction of 15 seater conference room at CNMC, Kahilipara with all required VC setup.

1.2.1 The work involves design, engineering, manufacture, assembly, inspection, testing at manufacturer's works before dispatch, packing, supply, including insurance during transit, delivery at site, subsequent storage and erection & commissioning at site of various equipment and materials including substation steel structures and civil foundations for equipment as specified in subsequent Clauses and Sections.

1.2.2 It is not the intent to specify completely herein all details of design and construction of the equipment and accessories. However, the equipment and accessories shall conform in all respects to high standards of engineering, design and workmanship and be capable of performing in continuous operation up to the bidder's guarantees in a manner acceptable to the Employer. The Employer will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgement is not in full accordance therewith.

1.2.3 Whether called for specifically or not, all accessories and work required for the completion of the work are deemed to be considered as a part of the Bidder's scope, unless and until mentioned very clearly as excluded.

1.2.4 The major items of works included in the scope of this specification are listed below:-

- i) Supply of all Video Conferencing, Network Security Solutions, Power Back Up & Protection Solutions, Discussion System Solutions, Networking Solution for CNMC & Substations including Civil and Related Works.
- ii) Erection, testing and commissioning of all the above as specified in Bill of Materials.
- iii) Construction of Conference Room Building as per Specification /Drawings including supply of all materials.

1.2.5 The name of substation/AEGCL sites that are to be integrated with Video Conferencing Solution at present inception state are:

Silchar T&T Circle, HQ Bijulee Bhavan, 220KV Tinsukia Substation, 220KV Lakwa Substation, 220KV Namrup Substation, 220KV Mariani Substation, 220KV Samaguri Substation, 132KV Depota Substation, 220KV Sarusajai Substation, 400KV Mirza Substation, 220KV Agia Substation, 220 KV BTPS, 132KV Dhaligaon Substation, 132KV Rangia Substation, 132KV Lakhimpur Substation and CNMC Kahilipara. The above site locations may vary at actual commissioning stage but shall be limited to geographical area of the state of Assam only.

1.2.6 The various items of works are described very briefly in the schedule of Bid Form, Prices & Other Schedules and Annexure. The various items as defined in these schedules shall be read in conjunction with the corresponding section in the technical specifications including amendments and, additions if any.

1.2.7 The Bidder's rates shall be based on the description of activities in the schedules as well as necessary operations detailed in Technical Specifications.

1.2.10 The tentative Bill of Quantities are furnished in Annexure-I at the end of this Section. Bidders are requested to note the following points:

j) The items mentioned in these Annexure shall only be used while preparing the Price Schedules. If any items which is not specifically mentioned in Annexure- I; but required to complete the works as per Specification shall be deemed to be included in any of the items of these Annexure. Additions, deletions or modification of these items while preparing the Price Bid by the Bidder shall render his bid non responsive.

1.3.0 CONTRACTOR TO INFORM HIMSELF FULLY

1.3.1 The contractor should ensure that he has examined the General Conditions, Specifications and Schedules as brought out in Volume-1 and this Volume and has satisfied himself as to all the conditions and circumstances affecting the contract price and fixed his price according to his own views on these matters and acknowledge that no additional allowances except as otherwise provided therein will be levied.

1.3.2 The Employer shall not be responsible for any misunderstanding or incorrect information obtained by the contractor other than information given to the contractor in writing by the Employer

1.4.0 SERVICE CONDITIONS

1.4.1 The plant and materials supplied shall be suitable for operation under the following climatic and other conditions:

- a) Peak ambient day temperature in still air : 45 °C
- b) Minimum night temperatures : 0 °C
- c) Reference ambient day temperature : 32.2 °C
- d) Relative Humidity
 - a) Maximum : 92 %
 - b) Minimum : 10 %
- e) Altitude Sea Level : 45 mts
- f) Average annual rainfall : 1744 mm
- g) Wind speed : 50 m/s

h) Seismic Zone : Zone 5

1.5.0 STANDARDS

1.5.1 The equipment covered by this specification shall, unless otherwise stated be designed, constructed and tested in accordance with the latest revisions of relevant **Indian Standards** and shall conform to the regulations of local statutory authorities.

1.5.2 In case of any conflict between the standards and this specification, this specification shall govern.

1.5.3 Equipment conforming to other international or authoritative Standards which ensure equivalent or better performance than that specified under Clause 1.5.1 above shall also be accepted. In that case relevant extracts of the same shall be forwarded with the bid.

1.6.0 ENGINEERING DATA

1.6.1 The furnishing of engineering data by the Contractor shall be in accordance with the Bidding Document. The bidder should fully comply to the specifications as mentioned herein. This review by the Employer shall not be considered by the Contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications.

1.7.0 FINAL DRAWINGS AND DOCUMENTS

1.7.1 The successful contractor shall provide drawings and documents of the complete solution in each AECGL sites. Instruction/Operation manuals of equipment should be provided.

1.8.0 APPLICATION AND SYSTEM SOFTWARE

1.8.1 Contractor shall provide original licence (wherever applicable) documents for all Systems and Solutions supplied and installed by them.

1.9.0 DESIGN IMPROVEMENTS

1.9.1 The Employer or the Contractor may propose changes in the installation design and if the parties agree upon any such changes and the cost implication, the same shall be modified accordingly.

1.10.0 DESIGN CO-ORDINATION

1.10.1 Wherever, the design is in the scope of Contractor, the Contractor shall be responsible for the selection and design of appropriate material/item to provide the best co-ordinated performance of the entire system. The basic design requirements are detailed out in this Specification. The design of various components, sub-assemblies and assemblies shall be so done that it facilitates easy field assembly and maintenance.

1.11.0 EMPLOYER'S SUPERVISION

1.11.1 To eliminate delays and avoid disputes and litigation it is agreed between the parties to the Contract that all matters and questions shall be resolved in accordance with the provisions of this document.

1.11.2 The manufacturing of the product shall be carried out in accordance with the specifications. The scope of the duties of the Employer, pursuant to the contract, will include but not be limited to the following.

- a) Interpretation of all the terms and conditions of these Documents and Specifications.
- b) Review and interpretation of all the Contractors drawings, engineering data etc.
- c) Witness or authorize his representative to witness tests at the manufacturer's works or at site, or at any place where work is performed under the contract.
- d) Inspect, accept or reject any equipment, material and work under the Contract, in accordance with the Specifications.
- e) Issue certificate of acceptance and/or progressive payment and final payment certificate.
- f) Review and suggest modification and improvement in completion schedules from time to time, and
- g) Supervise the Quality Assurance Programme implementation at all stages of the works.

1.12.0 INSPECTION & INSPECTION CERTIFICATE

1.12.1 The Employer, his duly authorized representative and/or outside inspection agency acting on behalf of the Employer shall have, at all reasonable times, access to the premises and works of the Contractor and their sub-contractor(s)/sub-vendors and shall have the right, at the reasonable times, to inspect and examine the materials and workmanship of the product during its manufacture/installation.

1.12.2 All routine and acceptance tests whether at the premises or works of, the Contractor or of any Sub-Contractor, the Contractor except where otherwise specified shall carry out such tests free of charge. Items such as labour, materials, electricity, fuel, water, stores apparatus and instruments as may be reasonably demanded by the Employer/inspector or his authorized representative to carry out effectively such tests in accordance with the Contract shall be provided by the Contractor free of charge.

1.12.3 If desired by the Employer, the Contractor shall also carry out tests as per applicable Standards. The Contractor is required to quote unit rates of type test charges in a separate Schedule (if such schedule is provided in the Bidding Document) in pursuance to this Clause. However, these test charges shall not be taken into account in comparing Price Bid.

1.12.4 The inspection by Employer and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed Quality Assurance Programme forming a part of the Contract.

1.13.0 GUARANTEED TECHNICAL PARTICULARS

1.13.1 The Guaranteed Technical Particulars of the various items shall be furnished by the Bidders in the prescribed schedules of this Specification (**SECTION-2**) with the **Technical Bid**. The Bidder shall also furnish any other information's as in their opinion is needed to give full description and details to judge the item(s) offered by them.

1.13.2 The data furnished in Guaranteed Technical Particulars should be the minimum or maximum value (as per the requirement of the specification) required. A Bidder may guarantee a value more stringent than the specification requirement. However, for testing purpose or from performance point of view, the material shall be considered performed successfully if it achieves the minimum/maximum value required as per the technical specification. No preference what so ever shall be given to the bidder offering better/more stringent values than those required as per specification except where stated otherwise.

1.14.0 PACKING

1.14.1 All the materials shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at Site till the time of erection. The Contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing.

1.14.2 The Contractor shall include and provide for securely protecting and packing the materials so as to avoid loss or damage during transport by air, sea, rail and road.

1.14.3 All packing shall allow for easy removal and checking at site. Wherever necessary, proper arrangement for attaching slings for lifting shall be provided. All packages shall be clearly marked for with signs showing 'up' and 'down' on the sides of boxes, and handling and unpacking instructions as considered necessary. Special precaution shall be taken to prevent rusting of steel and iron parts during transit by sea.

1.14.4 The cases containing easily damageable material shall be very carefully packed and marked with appropriate caution symbols, i.e. fragile, handle with care, use no hook etc. wherever applicable.

1.14.5 Each package shall be legibly marked by the-Contractor at his expenses showing the details such as description and quantity of contents, the name of the consignee and address, the gross and net weights of the package, the name of the Contractor etc.

1.15.0 CONSTRUCTION TOOLS, EQUIPMENTS ETC.

1.15.1 The Contractor shall provide all the construction equipment, tools, tackle and scaffoldings required for construction, erection, testing and commissioning of the works covered under the Contract including construction power water supply etc.. He shall submit a list of all such materials to the Employer before the commencement of work at site. These tools and tackle shall not be removed from the site without the written permission of the Employer.

1.16.0 MATERIALS HANDLING AND STORAGE

1.16.1 All the supplies under the Contract as well as Employer supplied items (if any) arriving at site shall be promptly received, unloaded and transported and stored in the stores by the Contractor.

1.16.2 Contractor shall be responsible for examining all the shipment and notify the Employer immediately of any damage, shortage, discrepancy etc. for the purpose of Employer's information only. The Contractor shall submit to the Employer every week a report detailing all the receipts during the week. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage and erection at site. Any demurrage, and other such charges claimed by the transporters, railways etc., shall be to the account of the Contractor.

1.16.3 The Contractor shall maintain an accurate and exhaustive record-detailing out the list of all items received by him for the purpose of erection and keep such record open for the inspection of the Employer.

1.16.4 All items shall be handled very carefully to prevent any damage or loss. The materials stored shall be properly protected to prevent damage. The materials from the store shall be moved to the actual location at the appropriate time to avoid damage of such materials at Site.

1.16.5 All the materials stored in the open or dusty location must be covered with suitable weatherproof and flameproof covering material wherever applicable.

1.16.6 The Contractor shall be responsible for making suitable indoor storage facilities, to store all items/materials, which require indoor storage.

1.16.7 The Contractor shall have total responsibility for all equipment and materials in his custody, stored, loose, semi-assembled and/or erected by him at site. The contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss.

1.16.8 The Employer will verify the storage facilities arranged by the contractor and despatch clearance will be provided only after Employer is satisfied.

1.17.0 CONTRACTOR'S MATERIALS BROUGHT ON TO SITE

1.17.1 The Contractor shall bring to Site all equipment, components, parts, materials, including construction equipment, tools and tackles for the purpose of the work under intimation to the Engineer. All such goods shall, from the time of their being brought vest in the Employer, but may be used for the purpose of the Works only and shall not on any account be removed or taken away by the Contractor without the written permission of the Engineer. The Contractor shall nevertheless be solely liable and responsible for any loss or destruction thereof and damage thereto.

1.17.2 The Employers shall have a lien on such goods for any sum or sums, which may at any time, be due or owing to him by the Contractor, under in respect of or by reasons of the Contract. After giving a fifteen (15) days' notice in writing of his intention to do so, the Employer shall be at liberty to sell and dispose off any such goods, in such manner, as he shall think fit including public auction or private treaty.

1.17.3 After the completion of the Works, the Contractor shall remove from the Site under the direction of the Engineer the materials such as construction equipment, erection tools and tackles, scaffolding etc. with the written permission of the Engineer. If the Contractor fails to remove such materials within fifteen (15) days of

issue of a notice by the Engineer, the Engineer shall have the liberty to dispose of such materials as detailed under clause 1.17.2 above and credit the proceeds thereto to the account of the Contractor

1.18.0 COMMISSIONING SPARES

1.18.1 It will be the responsibility of the Contractor to provide all commissioning spares required for initial operation till the Employer declares the equipment as ready for commissioning. All commissioning spares shall be deemed to be included in the scope of the Contract at no extra cost to the Employer.

1.18.2 These spares shall be received and stored by the Contractor at least 3 months prior to the schedule date of commencement of commissioning of the respective equipment and utilized as and when required. The unutilised spares and replaced parts, if any, at the end of successful completion of performance and guarantee test shall be the property of the Contractor and he will be allowed to take these parts back at his own cost with the permission of Employer's Representative.

ANNEXURE-I
SCHEDULE OF QUANTITY FOR VIDEO CONFERENCING SYSTEM(SUPPLY &ERECTION, TESTING & COMMISSIONING)

(Note: Items and Sub items shown in this Annexure shall only be used in preparing Price Bidding Schedules. Any other items not specifically mentioned here under are Deemed to be included in other Items)

Also the following schedules are for reference only. The prices are to be quoted online in the schedules uploaded in the e-tender portal.

Schedule: SCHEDULE OF QUANTITY FOR VIDEO CONFERENCING SYSTEM (SUPPLY/INSTALLATION)					
Sl. No.	Item Description	Quantity	Units	Unit Price (exclusive of taxes)	TOTAL AMOUNT (Without Taxes) in Rs. P
1	2	3	4	5	6
1	VIDEO CONFERENCING SOLUTION				
1.1	1+23 MCU Full HD Video Conferencing System	01	Set		0.00
1.2	55" Full HD LED Video wall display	09	Nos		0.00
1.3	HDMI Cables required for Video Wall Display	01	Set		0.00
1.4	Point-to-Point Full HD Video Conferencing System	15	Set		0.00
1.5	55" 4K Display	15	Nos		0.00
1.6	55" TV/Display Pedestal/Trolley suitable for Video Conferencing systems	15	Nos		0.00
2	DISCUSSION SYSTEM SOLUTION				
2.1	Boundary Microphone with Push to Talk button	15	Nos		0.00
2.2	Audio Signal Processor (DSP)	01	Nos		0.00
2.3	Analog Input Card	05	Nos		0.00
2.4	Analog Output Card	02	Nos		0.00
2.5	6.5" Two Way surface mount speaker	04	Nos		0.00
2.6	Amplifier - 4 Channel	01	Nos		0.00
2.7	PoE Gigabit Switch – 8 Port	01	Nos		0.00
2.8	Touch Screen Controller	01	Nos		0.00
2.9	Wireless Hand-Held Microphone	01	Nos		0.00
2.10	Wireless Head-Worn Microphone	01	Nos		0.00
2.11	27U Audio Visual Equipment Rack	01	Nos		0.00
2.12	Transparent Speaker Cable [1.5 Sq. mm.]	180	Mtrs		0.00
2.13	Digital Signal Cable	500	Mtrs		0.00
2.14	CAT6 UTP Cable	305	Mtrs		0.00
2.15	Pop-Up Box	04	Nos		0.00
2.16	HDMI over CAT6 extender	05	Nos		0.00
2.17	HDMI Switcher [8x1]	01	Nos		0.00
2.18	HDMI Audio De-Embedder	01	Nos		0.00
2.19	Wireless Collaboration Device	01	Nos		0.00
2.20	HDMI Cable 2 Mtrs	10	Nos		0.00
2.21	HDMI Cable 5 Mtrs	01	Nos		0.00
3.0	NETWORKING SOLUTION				

3.1	Enterprise Grade Managed 48-port stackable L3 switch Operating at 48 V	02	Nos		0.00
3.2	Industrial 8 port PoE+ Managed Switch Operating at 48 V	15	Nos		0.00
3.3	Enterprise Grade L2+ 8 Port PoE+ Managed Switch	16	Nos		0.00
3.4	Gigabit SFP Fiber Module [1000BaseLX (10km) SFP (10km with SMF, 1310nm)]	35	Nos		0.00
3.5	6 Core Optical Fiber Armoured Cable	6000	Mtrs		0.00
3.6	6 Port fully loaded Fiber LIU (Rack Mount, sliding)	32	Nos		0.00
3.7	OFC Patch cord 3m Duplex (LC-LC)	32	Nos		0.00
3.8	CAT6 SFTP Cable	2135	Mtrs		0.00
3.9	RJ48 Plugs for CAT6 SFTP Cable	200	Nos		0.00
3.10	Double Wall Corrugated HDPE Pipe 38mm Diameter	6000	Mtrs		0.00
3.11	42U Server Rack with all accessories	01	Nos		0.00
3.12	6U Wall Mounted Rack with all accessories	16	Nos		0.00
4.0	NETWORK SECURITY SOLUTION FOR 3 SITES OF AEGCL				
4.1	UTM Appliance for Main Station	02	Nos		0.00
4.2	UTM Appliance for Sub Stations office without Fiber Connectivity	02	Nos		0.00
5.0	POWER BACKUP & PROTECTION				
5.1	Online UPS System - 10 kVA (Built-in Isolation Transformer)	01	Nos		0.00
5.2	SMF batteries for 10kVA UPS to attain 60 minutes backup at full load	01	Set		0.00
5.3	Single Phase 10kA AC Transient Voltage Surge Suppressor	18	Nos		0.00
6.0	CIVIL AND RELATED WORKS				
6.1	15 Seater Conference Hall	01	Job		0.00
7.0	INSTALLATION, TESTING, COMMISSIONING, ORIENTATION & DOCUMENTATION	01	Job		0.00
Total in Figures					0.00

SECTION-2

DETAILED TECHNICAL SPECIFICATIONS

1. 1+23 MCU Full HD Video Conferencing System

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Video Standards	H.261, H.263, H263+, H.263++ , H.264 High Profile, H.264 Baseline Profile	
2	Video Frame Rate	Should support 60 fps or better with 1080p resolution from day one	
3	Video Features	Ability to send and receive two live simultaneous video sources in a single call, so that the image from the main camera and PC or document camera can be seen simultaneously Should support H.239 and BFCP protocols with 1080p resolution.	
4	Multi- Point Feature	Should have 1+23 way SIP, H.323 in 720p/30fps or better Multi point video conference feature enabled from day one.	
5	Video	Should support 3 monitors for Self View, Remote View and Content all in separate Monitors.	
6	Video Output	Should have at least 4 nos. of HDMI / Component (High Definition Multimedia Interface) output to connect Full High Definition display devices for both Video and Content.(Dual Monitor Support)	
7	Video Input	Should have at least 2 HD video Inputs to connect full HD cameras. Should have at least one additional video Input to connect auxiliary Full HD camera. Should have VGA/DVI/HDMI port to connect PC/ Laptop directly to the Video conferencing system to display resolutions up to 1080p	
8	Audio standards	G.711, G.722,G.722.1, 64 kbps MPEG-4 AAC-LD or equivalent standard must be supported.	
9	Other desirable features	Should have features of Noise Reduction, Automatic Gain control, Acoustic Echo Canceller from day one.	
10	Audio Inputs	Should support 4 Microphone inputs from day one Bidder should supply at least 1 table top digital microphone. The microphones must be standard based microphones. The pick-up of the microphones should be at least 10 feet from the microphone Echo Cancellation for every input must be available	
11	External devices	Should have USB port with built-in recording support	
12	Network Interfaces	2 LAN /Ethernet-10/100/1000 Mbps full duplex. Should have support for IPV4/IPV6 networks	
13	Mobile Connectivity	System should support and have ability to receive calls from MS Windows/ Android/ IOS devices as a participant in conference by a single licence in Codec	
14	Bandwidth	At least 6 Mbps and up to 18 Mbps	
15	Menu Control Security	Password protected system menu	
16	Encryption of video	ITU-T standards based Encryption of the video call	

	call	Call should be encrypted end-to-end on IP Should support Standards-based: SRTP (AES 128 bit), H.235 (AES 128 bit)	
17	Camera	Should be supplied with 2 (two) numbers of cameras having minimum 12x optical zoom and 10X digital zoom with 1920x1080p at 60 frames per second. Horizontal angle of view should be minimum 72 degrees, Vertical angle of view should be minimum 44.5 degrees	
18	Certifications	Should be CE, BIS, ISO9001 certified	
19	Warranty	Manufacturer warranty part number should be quoted, minimum 5 (Five) years comprehensive warranty should be provided for this unit from the date of successful commissioning	

2. 55" Full HD LED Video wall display

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Screen Size	Should be 55-Inch diagonally	
2	Resolution	Should be 1920 x 1080 (FHD)	
3	Aspect Ratio	Should be 16:9	
4	Panel Technology	Should be IPS	
5	Brightness	Should be minimum 500cd/m ²	
6	Viewing Angle (H x V)	Should be minimum 178°/178°	
7	HDMI In	Should be at least 2 from day 1	
8	DP In	Should be at least 1 from day 1	
9	DP Out	Should be at least 1 from day 1	
10	DVI-D In	Should be at least 1 from day 1	
11	DVI-D Out	Should be at least 1 from day 1	
12	USB	Should be at least 1 from day 1	
13	RS232C In	Should be at least 1 from day 1	
14	RS232C Out	Should be at least 1 from day 1	
15	Audio Out	Should be at least 1 from day 1	
16	Power Supply	Should run on 100 V ~ 240 V, 50-60 Hz	
17	Stand By - Power Consumption	Should be ≤0.5W	
18	Bezel to Bezel Width	Should not be more than 1.8mm	
19	Cabinet Colour	Preferably Black	
20	Certifications	Should have the following certifications: CB / EMC / CE / BIS / EER Copies of the certificates to be provided	
21	Remote Controller	Should be supplied	
22	Power Cord	Should be supplied	
23	Operating Manual	Should be supplied	
24	Wall Controller	Should have the capability to run independently without the need for external controller in 3 x 3 format from day 1	
25	Push/Pull Wall mount	Push/Pull wall mount bracket should be supplied along with the system	
26	Warranty	Minimum 5 Years manufacturer's comprehensive warranty	

3. HDMI Cables required for Video Wall Display

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Cable Length	As per site requirement (mix of 10Mtr & 1.5Mtr)	
2	Conductor Gauge	26AWG	
3	Conductor Material	Tinned Copper or Better	
4	Connector Plating	Gold	
5	Connector Type	HDMI (19pin) Male to Male	
6	Cable Shield Type	Aluminium Foil	
7	Cable Jacket Type	PVC or Better	
8	Rating	UL VW-1 (Flame rate), CSA	

4. Point-to-Point Full HD Video Conferencing System

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Video Standards	H.261, H.263, H263+, H.263++ , H.264 High Profile, H.264 Baseline Profile	
2	Video Frame Rate	Should support at least 60 fps with 1080p resolution from day one	
3	Video Features	Ability to send and receive two live simultaneous video sources in a single call, so that the image from the main camera and PC or document camera can be seen simultaneously. Should support H.239 and BFCP protocols with 1080p resolution	
4	Point to Point	Should have point to point connectivity on SIP/H.323 in 1080p/60fps conference feature enabled from day one	
5	Video	Should support Minimum 1 monitor & upgrade to 2 Monitors for Self View, Remote View and Content all in separate Monitors	
6	Video Output	Should have at least 1& upgradable to 2 nos. of HDMI / or equivalent (High Definition Multimedia Interface) output to connect Full High Definition display devices for both Video and Content.(Single / Dual Monitor Support)	
7	Video Input	Should have at least 2 HD video Input to connect full HD cameras. Should have at least one additional video Input to connect auxiliary full HD camera. Should have VGA/DVI/HDMI port to connect PC/ Laptop directly to the Video conferencing system and display resolutions up to 1080p	
8	Audio standards	G.711, G.722,G.722.1, 64 kbps MPEG-4 AAC-LD or equivalent standard must be supported	
9	Other desirable features	Noise Reduction, Automatic Gain control, Acoustic Echo Canceller	
10	Audio Inputs	Bidder should supply at least 1 table top microphone.	

		The microphones must be standard based microphones. The pick-up of the microphones should be at least 10 feet from the microphone Echo Cancellation for every input must be available	
11	External devices	Should have USB port for recording	
12	Network Interfaces	1 LAN /Ethernet-10/100/1000 Mbps full duplex. Should have support for IPV4 & IPV6 networks	
13	Bandwidth	At least 6 Mbps and up to 18 Mbps	
14	Menu Control Security	Password protected system menu	
15	Encryption of video call	ITU-T standards based Encryption of the video call Call should be encrypted end-to-end on IP Should support Standards-based: SRTP (AES 128 bit), H.235 (AES 128 bit)	
16	Camera	Should be supplied along with 1 number of 3x optical zoom camera with 1920x1080p 60 frames per second Pan range: +/-100 degrees, Tilt range: +/-20 degrees	
17	Certifications	Should be CE, BIS, ISO9001 certified	
18	Warranty	Manufacturer warranty part number should be quoted, minimum 5 (Five) years warranty should be provided for this unit from the date of successful commissioning	

5. 55" 4K Display

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Screen Size	Should be 55 Inch diagonally	
2	Resolution	Should be 3840 x 2160 (UHD)	
3	Aspect Ratio	Should be 16:9	
4	Panel Technology	Should be IPS	
5	Brightness	Should be 400cd/m ²	
6	Viewing Angle (H x V)	Should be minimum 178°/178°	
7	HDMI In	Should be at least 3	
8	DP In	Should be at least 1	
9	DVI In	Should be at least 1	
10	VGA In	Should be at least 1	
11	USB	Should be at least 3 (USB3.0*2 USB2.0*1)	
12	YPBPR	Should be at least 1	
13	AV-In	Should be at least 1	
14	PC-Audio In	Should be at least 1	
15	RJ-45 (LAN)	Should be at least 1	
16	RS232 In	Should be at least 1	
17	AV -Out	Should be at least 1	
18	Audio-Out	Should be at least 1	
19	SPDIF	Should be at least 1	

20	HDMI Out	Should be at least 1	
21	Inbuilt Speaker	Should be at least 20W (10W x 2)	
22	Power Supply	Should range from 100 V ~ 240 V, 50-60 Hz	
23	Stand By - Power Consumption	Should be $\leq 0.5W$	
24	Cabinet Color	Preferably Black	
25	Operating Temperature	Should range from $0^{\circ}C \sim 40^{\circ}C$	
26	Operating Humidity	Should range from 20% ~ 85% RH Non-Condensing	
27	Storage Temperature	Should range from $-10^{\circ}C \sim 60^{\circ}C$	
28	Storage Humidity	Should range from 10% ~ 90% RH Non-Condensing	
29	Certifications	Should be CB / EMC / CE / BIS / EER	
30	Remote Controller	Should be provided	
31	Power Cord	Should be provided	
32	Operating Manual	Should be provided	
33	Warranty	Minimum 5 Years manufacturer's comprehensive warranty	

6. 55" TV/Display Pedestal/Trolley suitable for Video Conferencing systems

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Should support 55 Inch Display Panel with facility for mounting Video Conferencing Codec and Camera. Should be built of Heavy Duty Mild Steel	

7. Boundary Microphone with Push to Talk button

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Microphone Type	Boundary Microphone	
2	Transducer Type	Should be Condenser type	
3	Frequency Response	Should be 45 - 20,000 Hz or better	
4	Polar Pattern	Should be Semi Cardioid	
5	Nominal Impedance	Should be $< 200 \Omega$	
6	Max. SPL at 1 kHz	Should be 102 dB or better.	
7	Switch	Should have ON/OFF Switch	
8	Warranty	Minimum 5 Years	

8. Audio Signal Processor (DSP)

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Audio, video and control Processor in a flexible chassis featuring 8 on board I/O card slots	
2		256 x 256 Networked Audio Channels,	
3		8 Audio I/O Card Slots supporting 4 Channel	

		Mic/Line Input Card, 4 Channel Line Output Card, Dante Audio Bridge Card, Cobra net Digital I/O Card, AVB Audio Video Bridge Card, AES-3 Digital I/O Card, AES/EBU Input Card etc.	
4		16 GPIO, individually configurable as Input or Output, supporting Input Types like Contact Closure, 10k Ohm 12V Potentiometer, TTL 3.3V Digital Input etc.	
5		Same unit should work as Main DSP supporting additional I/O expander options or as I/O Expander when used additionally with a similar Audio DSP	
6		Should be able to Control external devices using TCP/IP, RS232 and GPIO.	
7		64 Channels of AEC that can be freely assigned to any type of audio input (analogue or digital)	
8		64 Instances of VoIP	
9		16 Channel Multi Track Player Capacity, expandable up to 128 tracks	
10		Approximately 6 GB Media Drive built in, expandable up to 512 GB	
11		Up to 4 Tracks Audio Recorder Supporting mp3, WAV & FLAC file formats, 44.1 kHz & 48 kHz Sample Rate.	
12		Supports Event Scheduling, Media File Management etc. with Administrator Control & Password Protected Security	
13		Dual 1000 Mbps LAN Ports supporting Network Audio, Control, VoIP, AES67, Media Streaming etc.	
14		Should support networked peripherals like Networked Paging Stations, Networked Touch Screen Controller, Networked I/O Expanders, Networked AV-USB Bridging Device, Networked Amplifiers etc. connected to same network.	
15		Front Panel Screen that can display Device & Network Information	
16	Warranty	Minimum 5 Years	

9. Analog Input Card

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	4 Channel Analog Mic/Line Input Card	
2		+48V Phantom Power, Individually Switchable from Software	
3		A-Weighted Dynamic Range - >108 dB	
4		Distortion (20 Hz to 20 kHz, +4 dBu Nominal Input) – < 0.009 % THD+N	
5		Maximum Input Level – Switchable -16, 10,	

		21 & 27 dBu	
6		Analog to Digital Converter – 24-Bit, 48 or 96 kHz Sample Rate	
7	Warranty	Minimum 5 Years	

10. Analog Output Card

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	4 Channel Analog Line Output Card	
2		+48V Phantom Power, Individually Switchable from Software	
3		A-Weighted Dynamic Range - >108 dB	
4		Distortion (20 Hz to 20 kHz, +4 dBu Nominal Input) – < 0.009 % THD+N	
5		Maximum Input Level – Switchable -16, 10, 21 & 27 dBu	
6		Analog to Digital Converter – 24-Bit, 48 or 96 kHz Sample Rate	
7	Warranty	Minimum 5 Years	

11. 6.5" Two Way surface mount speaker

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Type	2 Way Full Range Surface-Mount Speaker	
2	Frequency Range	Should be(-10 dB): 60 Hz to 20 kHz	
3	Maximum Peak SPL at 1m	Should be 116 dB SPL	
4	Maximum Continuous SPL at 1m	Should be 110 dB SPL	
5	Nominal Coverage Angle	Should be 105 Degree Conical	
6	Rated Noise Power	Should be minimum 150 Watts	
7	Broad-band sensitivity	Should be 89 dB SPL	
8	General	6.5" LF Driver with 1" Voice Coil	
9		1" Aluminium Dome Tweeter with 1" Voice Coil	
10		Transformer Taps at 70 V: 60, 30, 15, 7.5 watts 100V: 60, 30, 15 watts 8 ohm bypass	
11		High Impact ABS Polymer Enclosure	
12		Powder Coated Steel Grill	
13		Powder Coated Steel Wall Mount Bracket should be included	
14	Warranty	Minimum 5 Years	

12. Amplifier – 4 Channel

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Should be Energy Star Qualified	
2		Frequency Response 20 Hz to 20 kHz	
3		60 Watts Dynamic Power per Channel at 8/4 Ohms, both channels driven	

4		Dual Bridge Mode Power 200 Watts at 8/4 Ohms & 250 Watts at 70/100 V	
5		80 Hz High Pass Filter when used in Bridged Mode in 70/100V	
6		Front Panel Power, Per Channel Signal & Clip LED	
7		Maximum Input Level +24 dBu	
8		Input Sensitivity +4 dBu	
9		Maximum Voltage Gain 25 dB	
10		Rack Mountable Half Rack 1U Enclosure, Mounting Brackets included	
11	Warranty	Minimum 5 Years	

13. PoE Gigabit Switch – 8 Port

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Switch should be compatible with the Audio DSP	
2	Switching Capacity	Should be at least 20 Gbps	
3	Forwarding Rate	Should be at least 14.44 Mpps	
4	MAC Address Table-Size	Should be 8K or better	
5	Power Budget	Should be 65W or better	
6	PoE Standard	Should be IEEE 802.3af and IEEE 802.3at	
7	VLAN	802.1Q VLAN Group Max. 256 static VLAN groups Configurable VID from 1 - 4094	
8	Quality of Service (QoS)	802.1p Quality of Service 8 queues per port Port-based Bandwidth Control	
9	L3 Features	IPv4/IPv6 static route entries Supports IP interfaces	
10	Access Control List (ACL)	MAC based & IP based ACL	
11	OAM	Cable diagnostics	
12	Warranty	Should be supplied with replacement warranty of 5 Years	

14. Touch Screen Controller

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	8" Capacitive IPS, 16M colours In-Wall Touch Screen Controller	
2		Resolution - 1280 x 820	
3		Panel Orientation- Vertical / Horizontal	
4		Should have 400 Nits Brightness	
5		Power - IEEE PoE 802.3af class 3 via LAN Port or +24VDC @ 1.0 A Barrel Connector	
6		LAN - 1000 Mbps full-duplex RJ45	
7		Table Top Stand Accessory should be included	
8	Warranty	Minimum 5 Years	

15. Wireless Hand-Held Microphone

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Display on Transmitter and Receiver	
2		RF Power output 50mW or Better	
3		Polar Pattern : Cardioid	
4		Carrier frequency range: 500Mhz to 865Mhz	
5		Frequency response: 20Hz to 20Khz	
6		Mute Button on Transmitter	
7		Battery Operation time Minimum 8hr	
8		Should have Charging Contact in Transmitter	
9		Receiver dynamic range 80 dB (A-weighted) Or better	
10		Switching bandwidth Minimum 30 Mhz Or better	
11		Should have Charging Contact in Transmitter	
12		Receiver dynamic range 80 dB (A-weighted) Or better	
13	Warranty	Minimum 5 Years	

16. Wireless Head-Worn Microphone

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	12 Channel Pre-set or better	
2		Display on Transmitter and Receiver	
3		RF Power output 50mW or Better	
4		Polar Pattern : Cardioid	
5		Carrier frequency range: 500Mhz to 865Mhz	
6		Frequency response: 20Hz to 20Khz	
7		Mute Button on Transmitter	
8		Battery Operation time Minimum 8hr	
9		Should have Charging Contact in Transmitter	
10		Receiver dynamic range 80 dB (A-weighted) Or better	
11		switching bandwidth Minimum 30 Mhz Or better.	
12	Warranty	Minimum 5 Years	

17.27U Audio Visual Equipment Rack

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Adjustable Levellers set of 4	
2		19" Reduced Channel - Loop Type	
3		Glass Door-800-27U	
4		Hexagonal Perforated Door-27U-800	
5		Side Panels-1000-27U-Vented	
6		FHU with 2 FAN 180CFM	
7		Horizontal Power Distribution Unit with 6 x 5/15A sockets Round Pin, 230 Volts AC, 32 Amp with Plug	
8		Mounting Hardware-(Pack of 20)	
9		OEM should be ISO9001 and ISO14001 certified for design, development for LAN & WAN products	

18. Transparent Speaker Cable [1.5 Sq. mm.]

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	No. of Strands: 48	
2		Size of Strand: 0.20 mm	
3		Cond. Type: ATC	
4		Overall Dia: 7.20 mm	
5		No. of Strands: 48	
6		Size of Strand: 0.20 mm	
7		Cond. Type: ATC	
8		Overall Dia: 7.20 mm	
9		No. of Strands: 48	
10		Size of Strand: 0.20 mm	
11		Cond. Type: ATC	
12		Overall Dia: 7.20 mm	

19. Digital Signal Cable

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Cross Section Area: 0.20 mm ²	
2		No of Strands: 25	
3		Size of Strands: 0.10mm	
4		Cond. Type: ATC	
5		Shield: ATC Spiral	

20. CAT6 UTP Cable

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Category 6 Unshielded Twisted Pair 4 pair 100W cable shall be compliant with ANSI/TIA/EIA-568-C.2-1 Additional Transmission Performance Specifications for 4-pair 100W Category 6 Cabling. Cat6 cable should be tested up to 600MHz.	
2		Category 6 UTP cables shall extend between the work area location and its associated telecommunications closet and consist of 4 pair, 23 AWG, UTP.	
3		The 4 pair Unshielded Twisted Pair cable shall be UL Listed, ETL Certified.	
4		Construction: 4 twisted pairs separated by internal X shaped, 4 channel, polymer spine / full separator. Half shall not be accepted.	
5		Conductor Solid bare Copper	
6		Conductor Diameter 0.56±0.005mm (23 AWG)	
7		Insulation :High Density Polyethylene	
8		Jacket PVC	
9		Outer Diameter 6.1 mm nominal	
10		Temperature Range -20° to +70°C	
11		OEM should be ISO9001 and ISO14001 certified for design, development for LAN & WAN products.	

21. Pop-Up Box

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	POP-UP Box should have RJ45 x 1, Audio jack x 1, HDMI x 1, VGA x 1, USB x 1, Universal power socket x 1, Video x 1, USB Charger X 1	

22.HDMI over CAT6 extender

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Video Resolution: HDTV resolutions: 480p, 720p, 1080i, 1080p(1920 x 1080) PC resolutions: VGA, SVGA, XGA, SXGA, UXGA, WUXGA (1920 x 1200)" Signal Distance: 60 Mtrs or higher	
2	Warranty	Minimum 5 Years	

23. HDMI Switcher [8x1]

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Inputs	Should be HDMI X 8	
2	Impedance	Should be 100 Ohms or better	
3	Data Rate	Should be 18 Gbps or better	
4	Pixel Clock	Should be 600 MHz or better	
5	Compliance	HDMI 2.0 (3D, Deep Color) , HDCP 2.2 , Consumer Electronics Control (CEC)	
6	Max Resolution	Up to 4096 x 2160 / 3840 x 2160 @ 60Hz (4:4:4)	
7	Control	RS 232	
8	Warranty	Minimum 5 Years	

24. HDMI Audio De-Embedder

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Side Switch x 1 (HDMI Audio Out - ON/OFF)	
2		Side Switch x 1 (Audio Out Channel - AUTO/CH 5.1/CH 2)	
3		Push Button x 1 (Audio Function Selection)	
4		1. HDMI to HDMI	
5		2. DVI to HDMI	
6		3. ARC (Audio Return Channel)	
7		Interfaces: 1 x HDMI Type A Female	
8		1 x DVI-D Female	
9		Impedance: 100 Ohms	
10		Data Rate: 10.2 Gps (3.4 Gbps Per Lane)	
11		Pixel Clock: 340 MHz	
12		Compliance: HDMI 1.4 (3D, Deep Colour)	
13		HDCP 1.4 Compatible	
14		Resolution: HDMI 3840 X 2160@30HZ	
15		DVI 1920 x 1200	
16		Audio Output: Optical Audio: 1 x Toslink	
17		Coaxial Audio: 1 x RCA female	
18		Stereo Audio: 2 x RCA female	
19	Warranty	Minimum 5 Years	

25. Wireless Collaboration Device

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Cross Platform Support: Windows, Mac, IOS and Android	
2		Simultaneous Connection: 8	
3		Simultaneous Streaming on Screen: 1	
4		Output Resolution: 1920 X 1080	
5		Video Streaming: Required	
6		Wireless access point 2.4GHz / 5GHz	
7		Extended Desktop View: Required	
8		Display Auto Layout: Required	
9	Warranty	Minimum 5 Years	

26. HDMI Cable 2 Mtrs

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Length: 2 Mtr HDMI (3D, Deep Colour, 4K); HDCP 2.2 compliant True 4K (4096 x 2160 @60Hz) Gold-plated connectors for reliable transmissions	

27. HDMI Cable 5 Mtrs

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Length: 5 Mtr HDMI (3D, Deep Colour, 4K); HDCP 2.2 compliant True 4K (4096 x 2160 @60Hz) Gold-plated connectors for reliable transmissions	

ACTIVE NETWORKING OEM CRITERION

Sl. No.	Parameter / Criterion	Compliance
1	OEMs of proposed equipment/components should have their own registered office in India as per the prevalent/ applicable laws of India and be in operation in India for last five years as on the bid issuance date.	
2	Registered offices by way of Joint ventures, Franchise, agency, distribution partners will not be considered.	
3	OEM Installation Base: Should have deployment of same type of Industrial grade switches of min. 1000 units in Education/ PSU/Govt. projects in India. OEM should Submit Order Copy/Completion certificate as proof along with Bid.	
4	OEM should have quality standard certifications like ISO 9001-2008/ISO 14001/ ISO 27001, wherever applicable to ensure only quality OEM participation, as on date of RFP/Tender release	
5	Proposed OEM for any technology should not have filed for bankruptcy.	
6	The OEM for all active components should give a declaration that products or technology quoted are not end of- sale till 6 months from the date of RFP/Tender release and are not end-of-support till 5 years or more (Please specify if more) from date of RFP/Tender release. The declaration in OEM letterhead should be submitted along with Bid.	
7	The proposed OEM should not have been blacklisted by any State / Central Government Department or Central /State PSUs	
8	OEM should have minimum 1 spare depot in India for hardware replacement and dedicated TAC Support centre in India.	
9	OEM should be present in Gartner's magic quadrant for Wired LAN Infrastructure for the last three years	

28. Enterprise Grade Managed 48-port stackable L3 switch

Quoted Make & Model: _____

SL No.	Specification	Compliance
1.	Switch should have 48x10/100/1000 Base-T ports and 4x1/10G SFP+ ports from Day1. Should have hot-swappable 250W 48V DC dual power supply from Day 1.	
2.	should have 176Gbps switching fabric and 130Mpps forwarding rate	
3.	should support min 10KB Jumbo frames, min 16 K MAC addresses and min 4K configurable VLANs.	

4.	posed Virtual chassis or Equivalent technology should support high availability for both Layer 2 and Layer 3 Including for IP Multicasting optimized for Real time applications like Voice and Video IP traffic	
5.	n Virtual chassis bandwidth between the switches shall be min of 40Gbps and should support the redundancy across the geographically diversified locations (min 800 Mtrs), also Vendors should offer required cables/modules from day 1	
6.	should have full Layer 2 features like GVRP, STP, RSTP, MSTP/PVST, LACP/IEEE802.3ad, 50ms link recovery, Q-in-Q, Voice VLAN, Port and VLAN mirroring, DHCP server, relay and client for IPv4 and IPv6 from day one.	
7.	should have Static Routing for IPv4 & IPv6 from day1.	
8.	should support full layer 3 functionality like RIP, OSPFv3, RIPng, BGP4, PIMv4-SM, PIMv6-SM and other Layer 3 Multicasting features from Day1	
9.	support IGMP v1/v2, v3 snooping and MLDv1 and MLDv2 snooping	
10.	Should support 8 queues per port and Policy-based QoS based on VLAN, port, MAC and general packet classifiers	
11.	support ACL based on VLAN and physical port, DHCP snooping, Dynamic ARP Inspection, IP source guard, STP root Guard, BPDU protection, DoS attack blocking and virus throttling, MAC Based Authentication, Web – based Authentication and 802.1x, RADIUS, STP root guard, TACACS+, AAA & SSH.	
12.	should support IPv4 and IPv6 dual stack. Also, should have IPv6 ready logo and support OpenFlow for SDN	
13.	have dedicated Console and USB interface for easy management. Also, should have IPv6 management features like SNMPv6, Telnetv6 and SSHv6, Syslogv6, NTPv6 client and server, Ping pooling and trace route, sFlow/NetFlow, UDLD or equivalent, Active fiber monitoring or equivalent from day 1.	
14.	Certification: EN55022 class A, FCC class A, VCCI class A, EN55024, UL, cUL, TUV. RoHS Compliant and Energy Efficient Ethernet compliant (EEE)	
15.	switches along with DC power supply should be offered with min 5 years Remote Support, Software update service and Next Business Day hardware replacement with proper back-up on respective-OEM letter Head. All the switches and FO Modules should be from the same OEM. Datasheet should be available in OEM's Global Website. Bidder should not quote any product which is declared end of sale/life by the respective OEM. Bidder must Submit Test report of all the components at the time of Delivery	

29. Industrial 8 port PoE+ Managed Switch

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	Industrial managed PoE+ switch 8 x 10/100/1000T ports (PoE+ support) and 2x 1G SFP combo ports from Day1.	
2	Performance: Switching capacity min 20Gbps and min forwarding rate min 14Mpps, Min 8K or better MAC address, Min 4K configurable VLAN, Packet buffer min 4Mb and 9Kb Jumbo frame	
3	POE + Standards should be in accordance with IEEE 802.3af and IEEE 802.3at standards with 30W PoE+ with PoE budget of 120W	
4	L2 Features: IEEE 802.3ac, IEEE 802.3az, IEEE 802.1ad, IEEE 802.1Q, IEEE 802.1D, IEEE 802.3ad, RSTP, MSTP, GVRP or equivalent, VLAN stacking or Q-in-Q, Loop back detection and storm control, REP/ ITU-T G.8032/equivalent open standard with seamless integration with other control centre switch/core L3 switch	
5	QOS: Should support eight priority queues, IEEE 802.1P and traffic shaping and rate limiting	
6	Multicast Protocols for Video: IGMP snooping v1, v2 and v3, MLD snooping (v1 and v2) and min 255 or better multicast entries	
7	Security: Should support IEEE 802.1x based port authentication, DHCPv4 client, RADIUS, SSL, SSH, Port Mirroring	
8	IPv6 Features: Should support DHCPv6, ICMPv6 and neighbour discovery for IPv6	
9	Management: SNMPv1, v2c and v3, ICMPv6, LLDP, RMON, Web GUI and CLI	
10	Operating Temperature: Min of -10°C to 75°C, Humidity: 10% to 95% or better	
11	Certifications: CE, FCC, TUV, VCCI, EN60068-2-27/IEC60068-2-27, IEC60068-2-31/EN60068-2-31, EN60068-2-6/IEC60068-2-6, NEMA TS2, EMC: EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN55024, EN55032, EN50121-4.	
12	UL/IEC/EN 60950-1; ROHS and WEEE Compliance; Min. IP30 Enclosure Rating, DIN Rail Mounting	
13	All the switches should be offered with min 5 years Remote Support, Software update service and Next Business Day hardware replacement with proper back-up on respective-OEM letter Head. All the switches and FO Modules should be from the same OEM. Datasheet should be available in OEM's Global Website. Bidder should not quote any product which is declared end of sale/life by the respective OEM. Bidder must Submit Test report of all the components at the time of Delivery	

30. Enterprise Grade L2+ 8 Port PoE+ Managed Switch

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	L2 switch with 8x10/100/1000T PoE ports and 2x100/1000X SFP ports and populated with 2 SFP SM Module from Day1. Minimum PoE power budget should be 124 Watt.	

2	Should have Minimum 20Gbps switching bandwidth and Min. 14Mpps Switch- forwarding rate. The switch should work Wire speed forwarding from day 1.	
3	Layer 2 Features: Should support STP, RSTP, MSTP, IGMP v1/v2/v3 snooping, loop protection, STP root guard, Voice VLAN, MLD snooping (MLDv1 and v2), min 10KB Jumbo frames , 16k MAC Table or more, PVST+ compatibility mode, VLAN Mirroring (RSPAN), Support IEEE 802.1Q (4000 VLAN IDs), VLAN classification by protocol and port, VLAN tagging.	
4	Resiliency: Should support IEEE 802.17/equivalent for sub 50ms ring protection in following scenario: single, dual fibre cuts in ring, Control Plane Prioritization (CPP), Loop Detection and Loop protection.	
5	Security: Should support ACL, DHCPv4 and DHCPv6 client, IP Source guard, DAI, Private VLAN, AAA, Authentication (MAC, Web and IEEE 802.3x), BPDU Protection, sflow or equivalent, SSLv2 and SSLv3, TACACS+	
6	QoS: Policy-based QoS based classifying traffic based on MAC, Port, VLAN, Protocol, Tail drop for queue congestion control, Strict priority/ weighted round robin.	
7	Switch should support static routing and RIP from day 1.	
8	Management: CLI, GUI, USB or equivalent memory slot for taking backup of software release files configurations, DDM –Optical digital diagnostic monitoring, UDLD or equivalent, Time Domain Reflectometry /equivalent, RMON 4 groups, SNMPv3, LLDP-MED, IEEE 802.3az, SNMPv6, Telnetv6, SSHv6 and Syslogv6 and NTPv6 Client and Server	
9	The switch should support ping pooling and trace route for IPv4 and IPv6	
10	Switch should have IPv6 ready logo from Day 1.	
11	Operating Temperature: Min of 0°C to 50°C	
12	Switch Should Be RoHS compliant and Certifications: UL, cUL, EN, FCC	
13	All the switches should be offered with min 5 Years Remote support, Software updates and Next Business Day Hardware replacement with proper back-up on respective-OEM letter Head. All the switches and FO Modules should be from the same OEM. Datasheet should be available in OEM's Global Website. Bidder should not quote any product which is declared end of sale/life by the respective OEM. Bidder must Submit Test report of all the components at the time of Delivery	

31. Gigabit SFP Fiber Module [1000BaseLX (10km) SFP (10km with SMF, 1310nm)]

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	Single mode - Media Type	
2	Wavelength- 1310 nm	
3	Distance support - Min 10 Km	
4	Connector LC Type	
5	Hot swap architecture	
6	Min. operating temperature range: 0 Degree C to 70 Degree C	
7	FO Module should be MSA compliant	
8	Min. Data rate 1 Gbps	

9	All the SFP modules should be offered with min 5 years Remote Support, Software update service and Next Business Day hardware replacement with proper back-up on respective-OEM letter Head. All the FO Modules should be from the same OEM as the Switch. Datasheet should be available in OEM's Global Website. Bidder should not quote any product which is declared end of sale/life by the respective OEM. Bidder must Submit Test report of all the components at the time of Delivery	
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32. 6 Core Optical Fiber Armoured Cable

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	6 Core Single Mode Outdoor Armoured Fiber Optic Cable	
2	Protected by Glass-yarn in between corrugated steel tape & loose tube	
3	Sequential meter marking	
4	Standards: ISO 11801, IEC60793-1, IEC60794-1.2, ITU-T REC G.652D, Telecordia GR-20 Core	
5	The fiber type is a Matched Cladding Single Mode	
6	Fiber dual coated with acrylate coating.	
7	The fiber is optimized for operation at 1310 nm and at 1550 nm.	
8	Nominal Mode Field Diameter: 9.2 μ m	
9	Mode field diameter tolerance: \pm 4%	
10	Cladding Diameter: 125 μ m	
11	Cladding diameter tolerance: \pm 1 μ m	
12	Mode field Concentricity error: < 1 μ m	
13	Cladding non-circularity: < 2 %	
14	Germanium doped core with no phosphorus i.e. reduced tendency for hydrogen degradation.	
15	UV-curable dual layer acrylate coating, which ensures excellent micro bending and abrasion resistance.	
16	Attenuation (of cable with fibers):	
	At 1310 nm: \leq 0.36 dB/km	
	In the range 1285-1330 nm : \leq 0.40dB/km	
	At 1550 nm : \leq 0.22 dB/km	
17	OEM should have valid ISO 9001 & ISO 14001 certification for design & development for wired networking products. Certificate to be provided.	

33. 6 Port fully loaded Fiber LIU (Rack Mount, sliding)

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	Have sufficient slots accommodate Simplex LC adapters individually.	
2	Aluminium base material for light mounting	
3	Should have Splice Tray & Cable Spool provision inside	
4	Accessory kit consists of cable ties, mounting ear screw earthing and spiral wrap tube.	
5	Panel cover should be slide out for easy maintenance	
6	Removable Rear & Front cover for better access to interior of LIU	
7	Should be loaded with 6 nos.of LC Single mode simplex adapters	
8	Adapters should be Telcordia, TIA/EIA, IEC compliant	
9	Should be loaded with 12 Nos of Fiber Pigtails of the same OEM Specifications:	

	<ul style="list-style-type: none"> - Corning Optical Fiber single mode complying G652D, G657A & G657B - LC type Single Mode Connector - Low insertion & return loss, clean & scratch free faces - 1Mtr length 	
10	OEM should have valid ISO 9001 & ISO 14001 for design & development for wired networking products. Certificate to be provided.	

34. OFC Patch cord 3m Duplex (LC-LC)

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	All optical fiber patch leads shall comprise of Single mode 9/125µm fiber with LC fiber connectors terminated at each end. The optical fiber patch leads shall comply with the following specifications:	
2	Optical Fiber – Corning Single Mode	
3	Connector: Zirconia ceramic ferrule	
4	Pre-radiuses and pre-polished ferrule	
5	Duplex	
6	Color-coded Yellow for SM	
7	Insertion Loss - <0.2 dB	
8	Cable: 9/125, SM	
9	Repeatability - < 0.2 dB	
10	Durability – 1000 mating cycle	
11	Working Temp : -40 deg C.to + 85 deg. C	
12	Standard : G652D, G 657A & G 657B	
13	OEM should have valid ISO 9001 & ISO 14001 for design & development for wired networking products.	

35. CAT6 SFTP Cable Reel of 305m

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	Category 6 Shielded and Foiled Twisted Pair 4 pair 100W cable shall be compliant with TIA/EIA-568.C.2 Additional Transmission Performance Specifications for 4-pair 100W Category 6Cabling. Cat6 cable should be tested up to 600MHz.	
2	Cat 6 SFTP cables shall extend between the work area location and its associated telecommunications closet and consist of 4 pair, 23 AWG Solid bare Copper	
3	The 4 pair Twisted Pair cable shall be UL Listed, ETL Certified.	
5	Construction: 4 twisted pairs separated by internal X shaped, 4 channel, polymer spine / full separator. Half shall not be accepted.	
7	Outer Cable Diameter 7.5mm nominal	
8	Insulation: High Density Polyethylene	
9	Shield: Aluminium / Polyester Foil Tinned copper Braiding	
9	Jacket FR-PVC / LSZH	
11	Temperature Range -20° to +70°C	
12	OEM should be ISO9001 and ISO14001 certified for design, development for LAN & WAN products.	

36.RJ48 Plugs for CAT6 SFTP Cable

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	Should be designed for SFTP Cables Contacts: 6 Micron gold over housing contact Insulation Resistance: 500M ohms (min.) Contact Resistance: Should not be more than 20m ohms Standards: Should meet UL94V-0	

37. Double Wall Corrugated HDPE Pipe 38mm Diameter

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Material	High Density Polyethylene	
2	Inner Diameter	Minimum 38mm	
3	Inner Wall	Smooth	
4	Outer Wall	Corrugated	
5	Couplers etc.	Should be supplied by the bidder	

38. 42U Server Rack with all accessories

Quoted Make & Model: _____

Sl. No.	Feature Description / Specification	Compliance
1	Casters Set of 4	
2	Adjustable Levellers set of 4	
3	19" Reduced Channel - Loop Type	
4	Perforated Door-800-42U	
5	Hexagonal Perforated Door-42-800	
6	Side Panels-1000-42U-Vented	
7	FHU with 2 FAN 180CFM	
8	Vertical Power Distribution Unit with 6 x 5/15A sockets Round Pin, 230 Volts AC, 32 Amp with Plug	
9	Fixed Shelf x 1 No	
10	Horizontal Cable Manager x 3 Nos	
11	Mounting Hardware-(Pack of 20)	
12	OEM should be ISO9001 and ISO14001 certified for design, development for such products.	

39. 6U Wall Mounted Rack with all accessories

Quoted Make & Model: _____

Sl. No.	Specification	Compliance
1	19", 6U x 500mm width x 450mm depth (min) Wall Mount Networking Rack	
2	It should confirm to DIN 41494 or equivalent standard	
3	It should be welded construction with steel frame	
4	Lockable tough ended glass front door	
5	19" mounting angle made of formed steel	
6	Powdered coated standard finish	

7	Top & Bottom welded cover with vented & cable entry exit cut outs	
8	2 pair of 19" mounting rails	
9	1U Cable Manager	
10	Roof Mounted Fan Unit	
11	230V AC, 6 way, 5 Amp Power Distribution Unit	
12	Mounting Hardware	
13	OEM should be ISO9001 and ISO14001 certified for design, development for LAN & WAN products.	

40. UTM Appliance for Main Station

Quoted Make & Model: _____

Sl.No.	Specification	Compliance
General Requirements		
1	Network security appliance should support "Stateful" policy inspection technology. It should also have application intelligence for commonly used TCP/IP protocols like telnet, ftp etc.	
2	The proposed vendor must have successfully completed latest NSS Labs' NGFW Methodology v9.0 testing (2019) with a minimum exploit blocking rate of 99%	
3	Proposed OEM must be in Leader quadrant of Gartner Magic Quadrant for Enterprise Firewall as per the latest report	
4	Firewall should be ICSA labs certified	
Hardware & Interface requirements		
1	The platform must be supplied with minimum 12x GE RJ45 inbuilt data interfaces & 2x GE SFP interface Slots from day one	
2	The Appliance should have USB & Console Ports	
Performance and Availability		
1	Minimum 6 Gbps Firewall throughput, 2,000,000 concurrent sessions, and 25,000 new sessions per second support from day one	
2	Minimum IPS throughput of 400 Mbps for real world traffic or enterprise mix traffic	
3	Minimum Threat Prevention Throughput (measured with Application Control and IPS and Anti-Malware enabled) of 200 Mbps for real world traffic or enterprise mix traffic	
4	Minimum 100 Mbps of SSL Inspection throughput from day one	
5	IPSec VPN throughput: minimum 3000 Mbps	
6	Simultaneous IPSec VPN tunnels: 500	
7	Proposed solution must support minimum 200 SSL VPN users from day one	
8	Proposed solution must support minimum 10 virtual firewall from day one	
Routing Protocols		
1	Static Routing	
2	Policy Based Routing	
3	The Firewall should support Dynamic Routing Protocol for RIP1 & 2, OSPF, OSPFv3, BGP4, RIPng	
Firewall Features		

1	Firewall should provide application inspection for LDAP, SIP, H.323, SNMP, FTP,SMTP, HTTP, DNS, ICMP, DHCP, RPC,SNMP, IMAP, NFS etc	
2	IPv6-enabled inspection services for applications based on HTTP, FTP, SMTP, ICMP, TCP, and UDP	
3	Allows secure deployment of next-generation IPv6 networks, as well as hybrid environments that require simultaneous, dual stack support of IPv4 and IPv6	
4	The firewall should support transparent (Layer 2) firewall or routed (Layer 3) firewall Operation	
5	The Firewall should support ISP link load balancing.	
6	Firewall should support link aggregation functionality to group multiple ports as single port.	
7	Firewall should support minimum VLANS 2048	
8	Firewall should support static NAT, policy based NAT and PAT	
9	Firewall should support IPSec data encryption	
10	It should support the IPSec VPN for both site-site and remote access VPN	
11	Firewall should support IPSec NAT traversal.	
12	Support for standard access lists and extended access lists to provide supervision and control	
13	control SNMP access through the use of SNMP and MD5 authentication.	
14	Firewall system should support virtual tunnel interfaces to provision route-based IPSec VPN	
15	The Firewall should have integrated solution for SSL VPN	
16	It should support the authentication protocols RADIUS, LDAP, TACACS, and PKI methods	
17	Licensing should be a per device and not user or IP based (should support unlimited users)	
Integrated IPS Features Set		
1	IPS should able to detect malicious traffic in IPV4, IPV6 and hybrid IPV6 and IPV4 network environment	
2	IPS should have DDoS and DoS anomaly detection and protection mechanism with automatic threshold configuration.	
3	Signature based detection using real time updated database & should have minimum 10000+ IPS signature database from day one	
4	Support SYN detection and protection for both targets and IPS devices.	
5	The device shall allow administrators to create Custom IPS signatures	
6	Should have a built-in Signature and Anomaly based IPS engine on the same unit	
7	Signature based detection using real time updated database	
8	Supports automatic security updates directly over the internet. (ie no dependency of any intermediate device)	
9	Security check updates do not require reboot of the unit.	
10	Configurable IPS filters to selectively implement signatures based on severity, target (client/server), protocol, OS and Application types.	
AntiVirus&AntiBot		

1	Firewall should support antimalware capabilities , including antivirus, botnet traffic filter and antispysware	
2	Solution should be able to detect and prevent unique communication patterns used by BOTs i.e. information about botnet family	
3	Solution should be able to block traffic between infected host and remote operator and not to legitimate destination	
4	Should have antivirus protection protocols for HTTP, HTTPS etc.	
5	The solution should be able to provide protection from known threats as well as unknown threats or zero day threats by integrating with cloud based sandboxing solution	
6	Solution should uncover threats hidden in SSL links and communications	
7	The AV should scan files that are passing on CIFS protocol	
8	The proposed system shall provide ability to allow, block attachments or downloads according to file extensions and/or file types	
9	The proposed system should be able to block or allow oversize file based on configurable thresholds for each protocol types and per firewall policy.	
Other support		
1	Should support features like Web-Filtering,Application-Control & Gateway level DLP from day one	
2	The proposed system should have integrated Enterprise-class Web Content Filtering solution with database which should support over 450 million webpages in 72+ categories and 68+ languages without external solution, devices or hardware modules.	
3	Should support detection over 3,000+ applications in multiple Categories: Botnet, Collaboration, Email, File Sharing, Game, General Interest, Network Service, P2P, Proxy, Remote Access, Social Media, Storage Backup, Update, Video/Audio, VoIP, Industrial, Special, Web (Others)	
4	QoS features like traffic prioritization, differentiated services. Should support for QoS features for defining the QoS policies.	
5	It should support the VOIP traffic filtering	
6	Appliance should have identity awareness capabilities	
7	The firewall must support Active-Active as well as Active-Passive redundancy.	
8	Solution must support VRRP clustering protocol.	
9	The solution should be able to prevent the mobile devices from mobile malware infections	
Management & Reporting functionality		
1	Support for Built-in Management Software for simple, secure remote management of the security appliances through integrated, Web-based GUI.	
2	Support accessible through variety of methods, including console port, Telnet, and SSHv2	
3	Support for both SNMPv2 and SNMPv2c, providing in-depth visibility into the status of appliances.	
4	The solution should have minimum 400 GB of internal SSD storage for logging & reporting functionality	
5	Should capable to provide a convenient method for alerting administrators when critical events are encountered, by sending e-mail alert messages to administrator defined e-mail addresses	

6	Solution must allow administrator to choose to login in read only or read-write mode	
Installation		
1	The UTM should be installed in High Availability Active-Active Mode	
Support and Services		
1	The UTM should be supplied with security subscriptions & comprehensive support for a period of 5 Years	

41. UTM Appliance for Sub Stations/Offices without Fiber Connectivity

Quoted Make & Model: _____

S.No	Specification	Compliance
General Requirements		
1	The proposed vendor must have successfully completed NSS Labs' NGFW Methodology v9.0 testing (2019) with a minimum exploit blocking rate of 99%	
2	Network security appliance should support "Stateful" policy inspection technology. It should also have application intelligence for commonly used TCP/IP protocols like telnet, ftp etc.	
Interfaces		
3	4x GE RJ45 inbuilt interfaces from day one	
4	The Appliance should have 1xUSB and 1xConsole Ports	
Performance and Availability		
5	The Firewall should provide minimum 500 Mbps of Firewall throughput, 500,000 concurrent sessions, and 10,000 new sessions per second support from day one	
6	Minimum IPS throughput of 200 Mbps for real world traffic or enterprise mix traffic	
7	Minimum Threat Prevention Throughput (measured with Application Control and IPS and Anti-Malware enabled) of 150 Mbps for real world traffic or enterprise mix traffic	
8	Encrypted throughput of IPSec VPN should be minimum 50 Mbps	
9	Simultaneous Remote Access IPSec VPN tunnels: 50	
10	Minimum 50 SSL VPN peer support from day one	
11	The solution should support minimum 5 Virtual Firewalls from day one	
Routing Protocols		
12	Should support Static Routes & Policy Based Routing	
13	Should support dynamic routing protocol like RIP, OSPF, BGP	
Operational Functionalities		
14	Firewall should provide application inspection for LDAP, SIP, H.323, SNMP, FTP,SMTP, HTTP, DNS, ICMP, DHCP, RPC,SNMP, IMAP, NFS etc.	
15	IPv6-enabled inspection services for applications based on HTTP, FTP, SMTP, ICMP, TCP, and UDP	

16	Firewall should support minimum 100 VLANs	
17	Firewall should support static NAT, policy based NAT and PAT	
18	The Firewall should support deployment modes as; "Route Mode" or "Transparent Mode"	
19	Should be able to inspect HTTP and FTP traffic when these are deployed using non-standard port(i.e. when HTTP is not using standard port TCP/80)	
20	Allows secure deployment of next-generation IPv6 networks, as well as hybrid environments that require simultaneous, dual stack support of IPv4 and IPv6	
Other support		
21	The Firewall should support ISP link load balancing for outbound traffic	
22	Should support features like Anti-Virus,IPS,Web-Filtering,Application-Control, Gateway DLP, Web Application Firewall from day one	
23	The proposed system should have integrated Web Content Filtering solution with database which should support over 2 billion web pages in 72+ categories and 68+ languages without external solution, devices or hardware modules.	
24	Solution should uncover threats hidden in SSL links and communications with a minimum 100 Mbps of SSL Inspection throughput from day one	
25	It should support the VOIP traffic filtering	
26	Solution should be able to detect and prevent unique communication patterns used by BOTs i.e. information about botnet family	
27	Should have antivirus protection for protocols like HTTP, HTTPS, IMAPS, POP3S, SMTPS protocols etc.	
28	Should support LDAP, RADIUS, Windows AD, PKI based Authentication	
29	Should have a built-in Signature and Anomaly based IPS engine with minimum 10000+ IPS Signature support from day one on the same unit & also the IPS should have DDoS and DoS anomaly detection and protection mechanism with threshold configuration.	
30	The firewall must support Active-Active as well as Active-Passive redundancy.	
31	Should have integrated Application control solution & Should have identification support for at least 4000+ applications and the identification should be regardless of ports. The applications need to be predefined on the box.	
32	It should support the IPSec VPN for both site-site and remote access VPN and also should have integrated solution for SSL VPN	
33	The solution should support protection from mobile malwares for mobile operating systems & should support cloud based sandboxing for prevention from zero day threats	
34	The solution should have the flexibility to write security policies based on IP Address & User Name	
QoS		

35	QoS features like traffic prioritization, differentiated services. Should support for QoS features for defining the QoS policies.	
Management & Reporting		
36	Support for Built-in Management Software for simple, secure remote management of the security appliances through integrated, Web-based GUI.	
37	Support accessible through variety of methods, including console port, Telnet, and SSHv2	
38	Support for both SNMPv2 and SNMPv2c, providing in-depth visibility into the status of appliances.	
39	Should capable to provide a convenient method for alerting administrators when critical events are encountered, by sending e-mail alert messages to administrator defined e-mail addresses	
Certification		
40	Appliance shall be ICSA certified for Firewall	
41	OEM should be in Leaders quadrant of Gartner's – in Enterprise Firewall Magic Quadrant as per the latest report	
Support and Services		
42	The UTM should be supplied with security subscriptions & comprehensive support for a period of 5 Years	

42. Online UPS System - 10 kVA (Built-in Isolation Transformer)

Quoted Make & Model: _____

Sl. No.	Specification		Compliance
1	Rating	10KVA	
2	Technology	Online, Double Conversion, IGBT, High Frequency PWM	
3	Input	Rated voltage	400vac 3-phase, 4 wire
4		Voltage Range	220/230/240 VAC 1- Phase 2 Wire
5			380/400/415 VAC 3-Phase 4 Wire
6			Rated Frequency
7		Frequency Range	40Hz ~ 70Hz
8		Power factor	≥0.95 at full load
9		Input THDI	<5%: Linear load
10		Input phase reversal	Yes
11	Output	Rated power	10KVA/10kW
12		Voltage	220/230/240VAC (single phase)
13		Frequency synchronization range	Rated frequency ±3Hz. Configurable range: ±0.5Hz ~ ±5Hz
14		Rated Power Factor	Unity
15		Crest Factor	3 : 1
16		Voltage harmonic distortion	< 2% (linear load); < 7% (non-linear load)

17		Voltage Regulation	2%	
18		Dynamic response recovery time	60ms	
19		Isolation transformer	Inbuilt at UPS output	
20		Inverter Overload Capability the utility mode	At 25°C: 105% ~ 125%- 5min; 125% ~ 150%-1min; 150%- more than 200ms	
21		Inverter Overload Capability the battery mode	At 25°C :105% ~125%-60~ 30 s; >125%- more than 200ms	
22	Bypass	Bypass Voltage range	Upper limit: +10%, +15% or +20%; default: +20%	
23			Lower limit: -10%, -20%, -30% or -40%; default: -40%	
24		Separate bypass	Yes	
25		Manual bypass	Inbuilt	
26	Efficiency	Online Mode (AC-AC)	91.00%	
27		Eco Mode	94%	
28	Battery	Type	Sealed, lead-acid	
29		VAH require for 60 mints	Min 15600 VAH	
30		Battery charging capacity	8A	
31	Transfer Time	Mains - Battery	0ms	
32		Inverter- Bypass	Synchronous transfer: ≤0ms	
33			Asynchronous transfer (default): ≤20ms	
34	UPS Parallel Numbers		4	
35	Noise		<65db	
36	Panel display mode		Graphical LCD display	
37	Remote Monitoring System		Integrated SNMP for monitoring	
38	Ambient Conditions	Operating temperature	0°C ~ 50°C ⁽²⁾	
39		Storage temperature	-40°C ~ +70°C (battery excluded); -25°C ~ +55°C (battery included)	
40		Relative humidity	5%RH ~ 95%RH, non-condensing	
41		Altitude	≤3000m; de-rating when higher than 3000m	
42	Mechanical parameters	Ventilation	Forced -air cooled	
43		Ingress protection	IP21	
44		Preferred Colour	Powder coated Black Texture finish	
45		Cable entry	Bottom	
46	Warranty		The UPS should carry warranty for a period of 5 Years. The batteries should carry warranty for a period of Minimum 3 Years	

43. SMF batteries for 10kVA UPS to attain 60 minutes backup at full load

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	General	As specified in the UPS Specifications	
2	Warranty	Should be supplied with replacement warranty for 5 Years	

44. Single Phase 10kA AC Transient Voltage Surge Suppressor

Quoted Make & Model: _____

Sl. No.	Parameters	Specifications	Compliance
1	Maximum Continuous Operating Voltage (MCOV)	320 VAC	
2	Maximum Load Rating	15A per UL & CSA (IEC Connector rating), 10A per VDE (IEC Connector rating)	
3	Operating Frequency Range	47 - 63 Hz	
4	Connection Type	2 Port	
5	Phase Configuration	2 Wire + Gnd	
6	Indication of Suppression Status	Should be available	
7	Input Connection (Line)	IEC C14 Socket (Inlet)	
8	Output Connection (Load)	IEC C13 Plug (Outlet)	
9	Enclosure	High Impact Plastic	
10	Modes of Protection	L-N, N-G	
11	Peak Surge Current Capability (3 x 20us)	L-N: 10kA, N-G: 10kA	
12	Clamping Voltage (L-N, N-G)	845V @ 100Amps	
13	Response Time	Should be <0.5ns in Normal Mode	
14	Warranty	Should be supplied with replacement warranty for 5 Years	

45. CIVIL WORKS FOR 15 SEATER CONFERENCE HALL

45.1 – Furniture (15 Seater Conference Hall)

SL No.	Item Description	Units	Quantity	Compliance
1	Conference Room Table (15 Seater):- Fabricating & Installation of conference room table as per drawing with Veneer table top with necessary wooden edge beading finished with melamine polish vertically supported made up 19mm marine ply boxing with teakwood supports finished with approved melamine as per details. Cutouts for cable cubbies as per details and directed by the Deptt. Base of the table to be spacious enough to conceal both data and power on separate vertical risers.	No.	1	
2	HIGH BACK CONFERENCE TABLE CHAIRS Height Adjustable Leather Finish Chrome Body Make: APWD Approved Make	Nos.	15	
3	ROLLER BLINDS Providing and Fixing Roller blind with manual functions and Plain Cassette of approved colour. - Conference Room	SqMtr	3.72	

45.2 – Electrical Works (15 Seater Conference Hall)

SL No.	DSR No.	Item Description	Units	Quantity	Compliance
1	ECBC 7.4	Supplying with installation testing and commissioning of Hi-wall 5 STAR rating non ducted split type air conditioner of the following capacity with cordless remote complete with indoor and outdoor unit,copper pipe and electrical connection cable,as approved by the Deptt.upto 5 m between the room unit and outdoor unit or as directed by the department			
	ECBC 7.4.1	2) 2 Ton Capacity			
	ECBC 7.4.1.3	3. APWD approved make	Each	2	
2	ECBC 7.1	FRAME WORK :- Supplying with fitting and fixing of Angle iron framing made 50MMX50MMX5MM size angle iron for accommodation of 1.00 Ton to 2.00 Ton Window/split type A.C. Machine	Each	2	
3	29.1	REFRIGERANT PIPING :- Installation and Commissioning of hard / soft copper Refrigerant piping of Approved Thicknesses, complete with Tubular Sleeve Insulation of nitrile Rubber, fittings, elbows, bends, supporting arrangement on walls.(1 Rmt pipe Consider together as Gas & Liquid) Including 2.5 Sqmm 4 Core Cable	Rmtr	25	

		connection between Indoor and Outdoor Unit			
4	NA	Drain Pipe:- Installation and Commissioning of 1" CPVC drain pipe	Rmt	25	
Electrical Work Including Fittings and Installation					
5	5.1	Wiring for circuit wiring with P.V.C. insulated single core unsheathed industrial flexible cable conforming to IS-694:1990 with flexible bright annealed copper conductor for voltage grade up to 1100 volts (Finolex/RR Kabel/Nicco/Anchor or Equivalent Make as approved by the APWD) in surface/recessed 2mm thick/heavy rigid PVC IS:9537 Part-III conduit (Berlia/AKG/Precision Plast/Polycab/MW or equivalent make as approved by the Deptt.) wiring system.			
6	5.1.1	With 2 x 1.5 sq.mm. Cable in 20 mm dia. 2mm thick/heavy rigid PVC IS: 9537 Part - III conduit.	Rmtr	320	
7	5.2	Wiring for circuit wiring with P.V.C. insulated single core unsheathed industrial flexible cable conforming to IS-694:1990 with flexible bright annealed copper conductor for voltage grade up to 1100 volts (Finolex/RR Kabel/Nicco/Anchor or Equivalent Make as approved by the Deptt.) in surface/recessed PVC 2mm thick conduit (Berlia/AKG/Precesion/Presto Plast/Polycab/MW or equivalent make as approved by the Deptt.) wiring system.			
7.1	5.2.1	With 2 x 2.5 Sq.mm + earth continuity with 1X1.5 sq.mm. in 20 mm dia. 2mm thick/heavy rigid PVC IS:9537 Part - III Conduit	Rmtr	180	
7.2	5.2.2	With 2 x 4 Sq. mm. + earth continuity with 1x2.5 sq.mm. cable in 20mm dia. 2mm thick/heavy rigid PVC IS : 9537 Part - III conduit	Rmtr	90	
7.3	5.2.4	With 2 x 10 Sq. mm. + earth continuity with 1 x 6 sq.mm. cable in 25 mm. dia 2mm thick/heavy rigid PVC IS: 9537 Part - III conduit	Rmtr	40	
8	SB.8.8	Supplying with fitting fixing of 6/10 amp one way modular clip in switch, MODEL RANGE LEGRAND (ARTERO), ANCHOR (AVE), MK (BLENZE), SCHNEIDER (ZENSELO), CRABTREE (MURANO) including making necessary connection as per direction of department.	Nos	4	
9	SB. 8.4	Supplying including installation of socket outlet 10/16 Amps 3/5 pin combine shuttered complete, MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE including making necessary connection as per direction of department	Nos	4	
10	SB.8.26	Supplying including installation of socket outlet 6 Amps 3 pin universal	Nos	10	

		combine shuttered complete, MODEL RANGE LEGRAND (MYRIUS), ANCHOR (VIOLA), MK (WRAPAROUND/PLUS), ABB (CHEIRON), KOLORS (KREST), SCHNEIDER (VIVACE), CRABTREE including making necessary connection as per direction of department			
11	SB.8.13	Supplying including and fixing of following metal boxes for MODEL RANGE LEGRAND (ARTERO), ANCHOR (AVE), MK (BLENZE), SCHNEIDER (ZENSELO), CRABTREE (MURANO) in surface/recessed system complete as per direction of department.			
11.1	SB.8.13.2	3 module type Metal	Nos	8	
11.2	SB.8.13.3	4 module type Metal	Nos	1	
11.3	SB.8.13.4	6 module type Metal	Nos	2	
11.4	SB.8.13.7	12 module type Metal	Nos	1	
11.5	SB.8.13.8	18 module type Metal	Nos	1	
12	SB. 8.14	Supplying including fitting fixing of following MODEL RANGE LEGRAND (ARTERO), ANCHOR (AVE), MK (BLENZE), SCHNEIDER (ZENSELO), CRABTREE (MURANO) front plate of suitable colour as per direction of department.			
12.1	SB.8.14.3	3 module	Nos	8	
12.2	SB.8.14.4	4 module	Nos	1	
12.3	SB.8.14.5	6 module	Nos	2	
12.4	SB.8.14.8	12 module	Nos	1	
12.5	SB.8.14.9	18 module	Nos	1	
13	A1	Supply installation and commissioning of Philips LED Cover Light - Natural White 30 Watt per 5 MtrQty 50 Mtrs along with DC power supply unit.	Nos	8	
14	A2	Supply installation and commissioning of Philips LED Panel light 12W/15W	Nos	10	
15	A3	Supply installation and commissioning of Philips Aura LED Down lighter 7W/9W	Nos	20	

45.3 – Paint Finish (15 Seater Conference Hall)

SL No.	DSR No.	Item Description	Units	Quantity	Compliance
		FINISHES			
	13.3.4	Providing two coats of Birla White Wall Care Putty (Water Resistant White Cement based putty for concrete/mortar walls and ceiling both internal and external) after removing all loosely adhering material from the wall surface with the help of emery stone, putty blade or wire brush and moistening the wall with sufficient quantity of clean water as specified and directed by the department. (Total thickness of two coats is maximum 1.5mm)			
		(i) Thickness = 1.5mm	Sqm	60	
	13.22	Removing white or colour wash by scrapping and sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete	Sqm	60	
	13.4.1	Wall painting (two coats) with acrylic emulsion paint approved brand and manufacture (Asian paint/ Berger paint/ ICI Paint/ J & N Paint/ Nerolac) on new surface to give an even shade after thoroughly brushing the surfaces free from mortar droppings and other foreign matter and sand paper smooth.			
		(a) Acrylic Emulsion Paint approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/J&N Paint/ Nerolac)	Sqm	60	
	13.4.2	Extra over item no. 13.4.1 above for every subsequent coat of wall painting with acrylic emulsion paint of approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/J&N Paint/ Nerolac)			
		(i) Acrylic Emulsion Paint approved brand and manufacture (Asian paint/ Berger paint/ ICI paint/J&N Paint/ Nerolac)	Sqm	60	

45.4 – Interior Works (15 Seater Conference Hall)

SL No.	DSR No.	Item Description	Units	Quantity	Compliance
1		<p>Providing & Fixing of Armstrong Wooden finished Suspended Ceiling System with Woodworks Vector edge tiles with Armstrong 15mm Prelude 43 exposed grid. The Tile in RG3003 (RG3) perforations having hole diameter as 3mm and open area as 3% with approved laminate (Portland Maple, Sea Beech, Siam Wood & Mystique Walnut) finish. Back side of the tile will have Soundtex fleece hot pressed to achieve NRC of 0.4, Humidity Resistance (RH) of 70% in module size of 600mm x 600mm x 18mm and density of 725 Kgs/M3. The tile edges should feature the vector edges or the engaging edges and the reverse tegular non engaging edge to hide the grid, creating a 6mm shadow reveal along with 0.7mm edge banding on exposed edges. The tile to provide downward mountability without any tools. The tile shall be laid on Armstrong Prelude 43 with 24 mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees with a web height of 43mm and a load carrying capacity of 17.8 Kgs/M2 (as per standard installation layout mentioned below) & pull out strength of 100Kgs. The T Sections have a Galvanizing of 90 grams per M2 and need to be installed with Suspension system of Armstrong make.</p>	Sqm	11.15	
2	7.6.1	<p>Providing, fitting and fixing in position plywood / hardboard partition walls with 6mm thick ply-board / hardboard (best) with horizontal and vertical Sal battens of size 50mm x 80mm spaced at not more than 1.20m apart with necessary nails, wood screws, bolts etc. complete as directed by the Department for all levels (Painting / Varnishing to be measured and paid separately).</p>			
		A) 6mm thick Ply-board			
		b) On both faces of the frame	Sqm	36.63	
3		<p>1MM Laminate panelling Over Plywood Partition Providing and fixing 1mm laminate with marine grade adhesive over plywood/hardwood partition as per approved design.</p>	Sqm	36.63	

4		DOORS FOR CONFERENCE HALL Supply and fixing 38mm thick veneer finish custom made 38mm thick Acoustic door of suitable size including complete Door fittings in Standard SS finish	Sqm	2.34	
5		1/2" thick ply panelling (with Veneer finish) Supply and installation of plywood (12 mm thick ply having density of 500-600 kg/m ³ , NRC 0.2, fire rating Class A). 12mm ply is fixed on basic profile, main profile & edge profile. The plywood will be back lined with 50 mm, 24kg density glass wool. Veneer with polish/Laminate of approved colour is fixed on Plywood	Sqm	27.81	
6		Column cladding with Plywood finished with Veneer (in Conference room) Cladding Framework till false ceiling to be cladded with 12 mm plywood in line and level screw fixed with 25mm drywall screws @ 300mm c/c with staggered joints to avoid through joints and finished with jointing tape and compound as per specification. Joints to be sand papered to achieve a smooth and seamless finish. Ply & Veneer surface till the false ceiling - Veneer surface to be finished with Melamine Polish as per Clients / Architects Instruction.	Sqm	2.09	
7		STORAGE CABINET Providing and fixing storage cabinet of 1219 mm height 1432 mm width with waterproof plywood finished with teak laminate internally and approved Veneer externally, The shutters of the wardrobe to be finished with Veneer as per design and cost to include all the drawers and shelves as per required by the Client, all finished with veneer as per approved, the cost to include all necessary hardware fittings like, hinges, locks, handles, chain, etc. melamine Veneer polish, all-inclusive as per design and details.	Sqm	1.31	
8		PLYWOOD BOXING FOR CONFERENCE ROOM Providing and Fixing plywood boxing of depth 76 mm finish with Veneer/Laminate externally on all sides. Rate to include storage embedded in the boxing with shutter finish with Veneer with all necessary Hardware fittings, hinges, locks,	Sqm	16.72	

		handles,ball catches, fully extendable drawer slides, locks, handles etc all complete as per approved make. Rate to include cut out and supports to fix LED screen, speakers and other MEP items as per requirement.			
9		Providing and Fixing Armstrong Channeled Woodworks perforated panels of width 192mm, thickness of 15mm and length 2400 mm or as required by the Architect/ approving engineer, made of a high density fibre board with minimum 725 Kg/M3 density substrate with a laminated facing as per the approved shade & finish and a melamine balancing layer on the reverse side. The boards shall have a special perforation pattern where the visible surface has a "Helmholtz" fluted perforation of 3mm width and 21mm of visible panel each. The edges of the panels shall be "tongue-and-grooved" to receive special clips for installation. The back of the perforated panel shall have sound absorbing non-woven acoustical fleece having NRC of 0.52. The panels shall be mounted on special aluminium splines using clips provided by Armstrong and approved by the Architect/ Engineer-in-Charge.	Sqm	16.72	
10		CARPET TILE FLOORING FOR CONFERENCE AREA Providing and laying of 2X2 carpet tile, 100% eco solution premium branded nylon, solution dyed, pattern loop of approved shade, all complete	Sqm	49.44	

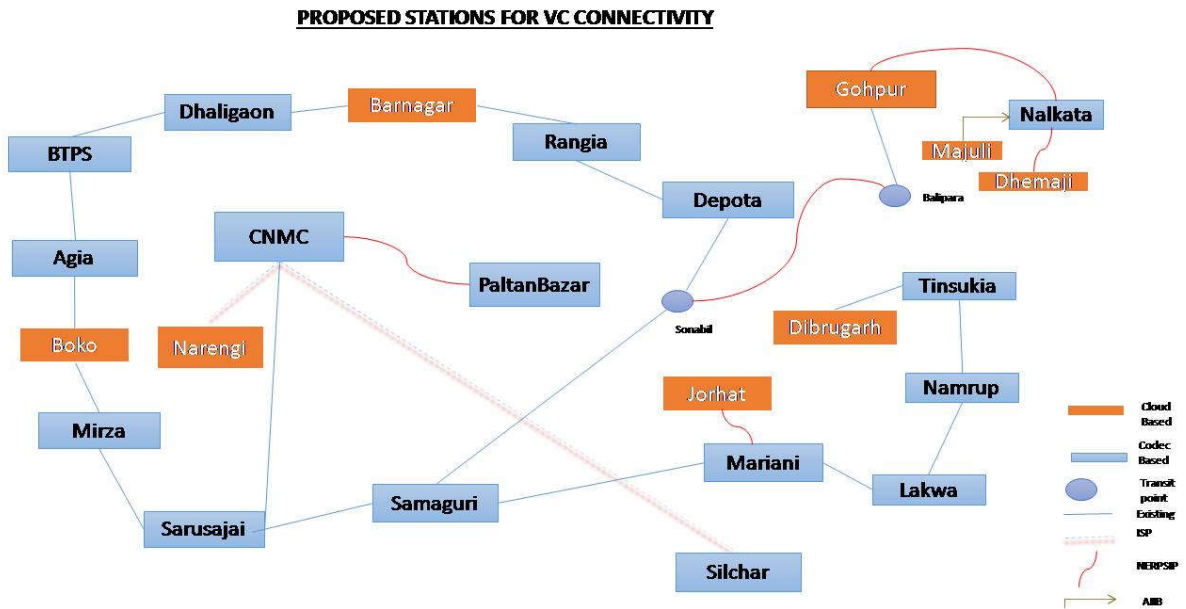
46. Installation, Testing, Commissioning, Orientation & Documentation

Sl. No.	Parameters	Specifications	Compliance
1	General	The installation should be done in accordance to the guidelines provided by the concerned officer	
2		It should conform to all the industry standards	
3		No child labour should be engaged in the process	
4		The vendor should take all the responsibility of the personnel deployed by them throughout the entire period of the installation process	

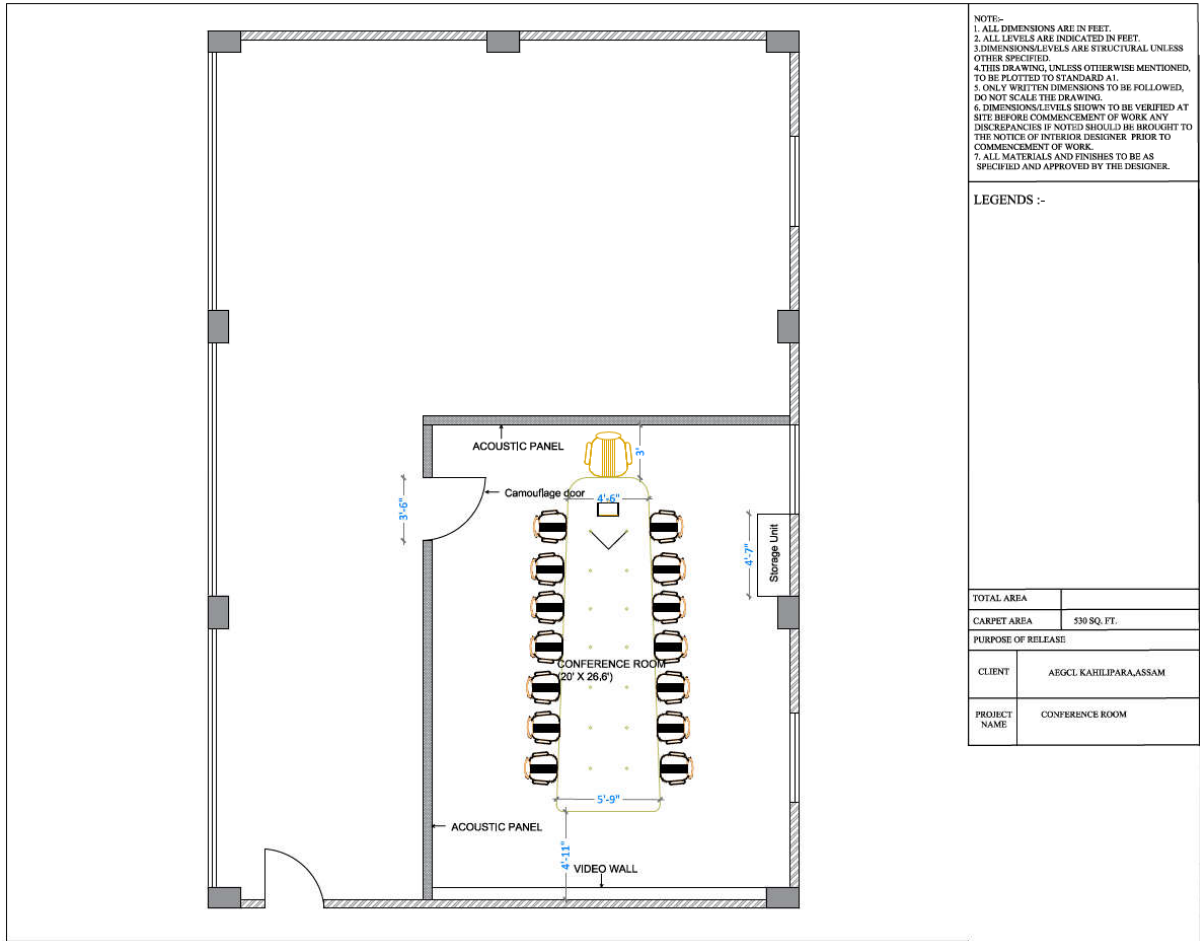
5	Testing	All the equipment should be tested thoroughly for optimum functionality. Further a test certificate has to be provided	
6	Training	Comprehensive Training has to be provided to our personnel regarding handling & basic trouble-shooting.	
7	Documentation	A comprehensive documentation has to be provided in a form of booklet and DVD/Pen-drive mentioning all the relevant information of equipment, installation notes, device details, map showing the installation locations, etc. and video files separately of the training	
8	Accessories	All required accessories has to be supplied for completion of the job. AEGCL shall not be responsible for any short supply of components which shall be necessary for satisfactory installation of the system.	
9	Cable Laying	Underground OFC/SFTP cable laying should be done using HDPE DWC Pipes and should be installed at least 3 Feet under in hard and soft soil.	

SECTION-3 DRAWINGS

VC CONNECTIVITY:



CIVIL:
15 Seater Conference Room:



NOTE:-
 1. ALL DIMENSIONS ARE IN FEET.
 2. ALL LEVELS ARE INDICATED IN FEET.
 3. DIMENSIONS/LEVELS ARE STRUCTURAL UNLESS OTHERWISE SPECIFIED.
 4. THIS DRAWING, UNLESS OTHERWISE MENTIONED, TO BE PLOTTED TO STANDARD A1.
 5. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED, DO NOT SCALE THE DRAWING.
 6. DIMENSIONS/LEVELS SHOWN TO BE VERIFIED AT SITE BEFORE COMMENCEMENT OF WORK ANY DISCREPANCIES IF NOTED SHOULD BE BROUGHT TO THE NOTICE OF INTERIOR DESIGNER PRIOR TO COMMENCEMENT OF WORK.
 7. ALL MATERIALS AND FINISHES TO BE AS SPECIFIED AND APPROVED BY THE DESIGNER.

LEGENDS :-

TOTAL AREA	
CARPET AREA	530 SQ. FT.
PURPOSE OF RELEASE:	
CLIENT	AEGCL, KAHILPARA, ASSAM
PROJECT NAME	CONFERENCE ROOM