TENDER FOR ELV INFRASTRUCTURE – NS HOSPITAL, QUILON
SECTION- I - GENERAL TERMS, CONDITIONS & INSTRUCTIONS

1. **.....Objective.** The Customer (http://www.nshospital.org/en/), hereinafter referred to as "NS Hospital") intends to acquire a complete **ELV Technology Infrastructure and associated Systems** for their new Block located at N.H bypass, Palathara, Kollam, Kerala. The NS Hospital here-within requests proposals from our PQ qualified and experienced System Integrators for the installation, testing, and acceptance of the **Low Volt Infrastructure** described in the attached technical specifications, related documents and drawings. Prices quoted shall be the all-inclusive; ie, net amount and represent complete installation at the site as per this documentation and instructions or corrigendum being issued from time-to-time. Our selected ELV Contractor shall be responsible for all parts, labour, and other associated apparatus necessary to completely install, test, and turnover his installation for acceptance to NS Hospital detailed herein.

2. **.....Important Dates & Milestones**.

#	KEY EVENTS - DATES & TIME	
	Name of Tender	**ELV INFRASTRUCTURE – NS HOSPITAL**
A	Tender Reference Number	15112018/NSMIMS/5531
B	Name of the Assignment/Project	Supply, Installation, Integration, Testing, Proving and Handing over – on Turnkey basis
C	Last date of Issue/Download	22 Nov 2018, till 03.00 PM
D	**Pre-bid Conference**	**09:30 PM, 22 Nov 2018**
F	Last Date for Bids Submission	30/11/2018, by 1200 Hours. *By hand or by registered post, with DD/BG. Soft copy by email, on opening of each cover*
G	Validity of Bids	180 days from opening of the Bids
H	Date of Opening of PQ Bids	30/11/2018, at 1415 Hours
J	Date of Opening of Tech Bids	To be intimated only to the PQ qualified bidders
K	Date of Opening of Price Bids	Will be intimated to bidders, cleared Technically
L	Cost of Tender (Non-Refundable)	Rs. 3,000.00 (including GST)
M	Earnest Money Deposit (Refundable)	Rs. 5,00000.00. (Valid for a period of 180 days from Proposal Due Date.)
N	Project Estimate	INR. Six Crores Approx
P	Project Warranty & Maintenance	One (01) Years, from project handing over with FMS
Q	Bid Queries & Contacts	Only by email, nsmimskollam@gmail.com,

3. **.....Tender Format.** The subject tender shall be a Three Cover Tender. Only the bids containing Pre-Qualification Cover would be opened on the time and date promulgated. Date and time of opening of the other two covers will be intimated only to those bidders, qualifying each evaluation stages.

4. .....**Bid Submission Formats**. Bids in sealed cover are invited for supply and installation of items listed in Part II of this RFP **on a two Bid system i.e Technical bid (T bid) and Commercial bid (Q bid).** Please superscribe the above-mentioned Title, Tender reference number and date of opening of the Bids on the sealed covers to avoid the Bid being declared invalid. The details of each covers are as follows:-

a) …… Cover-1. Pre-Qualification (PQ-Bid) – All documents in one sealed cover. The PQ cover shall also have the EMD and Cost of tender form as part of Pre-Qualification Bid. All prequalification documents as demanded in Section-II of this tender document are to form part of this cover along with EMD and Cost of the tender. Second cover shall have the Demand Drafts for EMD and Cost of tender.

b) Cover-2. Technical Bid (T-Bid). The Technical bid shall essentially include, unpriced BoM with OEM makes and Part Codes, **technical compliance documentations (with cross reference to the respective page numbers of the OEM product documentation**), clarifications, product documentations (as per compliance statements **with well tagged, highlighted)** be part of Technical bid. The bidder should furnish complete bill of materials with make and model for the offered products in line with our requirements. **Compliance statements quoting just "Complied" or "Yes" etc without adequate technical documentary proofs could be marked as "Not Qualified".** All terms and conditions of the bidder (if any) shall be the part of the unpriced "T" Bid.

c) Cover-3. Price Bid (Q-Bid). The Q-bid will only have the details of project pricing in our promulgated MS Excel Price format. Bidder may include their covering letter; but without ant T&C. Any attempt to alter the promulgated MS Excel sheet or submission of price bids in any other custom format may make the entire offer from the subject bidder void. To avoid disqualification, also please note that the price bid is not attached with other Bids/covers or indication of pricing is given elsewhere.

5. .....**Bid Despatch**. Bids in the form of Fax or Email shall not be accepted. The hard copies and its allied print-outs or documentations of ALL THREE COVERS, are to be forwarded to NS Hospital on or before the indicated Date and Time. Each such cover shall be super scribed suitably as "**NS Hospital ELV Infrastructure Tender**– Cover (1/2/3)". Covers without the superscription or with illegible markings shall not be opened. All the covers shall be addressed to The Secretary, NS Hospital, Quilon, and should reach the office of NS Hospital through REGISTERED POST/SPEED POST/By Hand on or before the due date and time of the bid opening. If the outer envelope is not sealed and marked as indicated above, NS Hospital shall assume no responsibility for the bid's misplacement or for its premature opening. NS Hospital shall not be responsible for any postal or delivery delays, due to any other unforeseen circumstances. It is also important for all the bidders to note that all incomplete covers/bids shall be rejected without assigning any reasons thereafter. Our evaluation committee may request for the soft copies of bidder submittals as part of their evaluation process. Hence, bidders are requested to keep soft-copies of documents ready for share, within 12 hours of request. However, if there is any conflict or difference between the soft-copy and printed submittals, the printed submittals shall be considered for evaluation.

6. .....**Late Bids**. Late bids will not be accepted. Hence, it is the responsibility of each bidder to ensure its submission well before the date and time indicated.

7. .....**Optional Bids**. A bidder can offer only one option as part of his proposal. However, an option for one particular component from another manufacturer could be accepted, if the chosen OEM for any particular component has a less complicated and more viable solution. But, please be noted that any mention of such an option, we the Buyer shall automatically opt for the technically higher quality option, while arbitrarily rejecting the rest.

8. **.....Earnest Money Deposit**. Bidders are required to remit the Earnest Money Deposit (EMD) for an amount of Rs. 5,00000/- (Rs. Five Lakhs only) as DD or Bank Guarantee. EMD of the unsuccessful

bidders shall be automatically returned (without interest) to them at the respective stages on finalisation / evaluation) and/or within 30 days after the award of the contract. Similarly, the Bid Security of the Contractor would be returned, without any interest whatsoever, after the receipt of **Security Deposit or Performance Bank Guarantee** from him. The format for the submission of the Bid Security is placed as Forms-I. Each bidder is to duly fill the blanks and submit the same alongwith the PQ Bid (Cover-1).

9. .....**Forfeiture of EMD – the Bid Security.** The EMD shall be forfeited if the bidder withdraws or amends impairs or derogates from the tender in any respect within the validity period of their tender. In all such cases, the decision of the NS Hospital regarding forfeiture of the Bid Security and rejection of bid shall be final & shall not be called upon question under any circumstances. The Bid Security can also be forfeited if a Bidder:-

a) During the bid process, if he/she indulges in any such deliberate act as would jeopardize or unnecessarily delay the process of bid evaluation and/or finalization.

b) During the bid process, if any information found wrong / manipulated / hidden in the bid.

c) Canvassing by the Bidder in any form, unsolicited letter and post-tender correction may invoke summary rejection with forfeiture of EMD.

d) The bidder withdraws his tender after submission.

e) …. The bidder violates any of the provision of the terms and conditions of this tender specification.

f) ….. Bidder knowingly or unknowingly engages himself in any of the following unethical or corrupt or fraudulent practices during the course of this tendering process or project contract phase.

10. ....**Ethical Standards.** Bidders are expected to observe the highest standard of ethics during the entire course of this tendering process, procurement and execution of the related contract. In pursuit of this policy, NSH will reject a proposal for award if it determines that the Bidder being considered for award has engaged in corrupt or fraudulent practices in competing for the Contract. For the purposes of this provision, the terms set forth below are defined as follows:

a) "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value or kind to influence the action in the procurement process or in Contract execution; and

b) "Fraudulent practice" means a misrepresentation of facts in order to influence the procurement process;

c) "Collusive practice" means designs to establish bid prices at artificial, non-competitive levels to deprive NSH of the benefits of competition.

d) Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the eligibility criteria document.

e) Record of poor performance such as abandoning work, not properly completing the contract, or financial failures/weaknesses etc.

11. **....Costs Associated.** NS Hospital shall not be liable for any cost incurred due to travel, stay or by the respondents in preparing responses to this Tender or demo or any other related expenses or associated with award of this work or contract.

12. ....**Site Visit**. The applicant or any of its authorized representatives will be granted permission to visit, carry out inspections, investigations or studied on our project site upon receipt of a formal request well in advance to the proposed date of inspection. Being a construction site, the permission would be subject to the express condition that the applicant will indemnify NS Hospital or its agents, or its advisors, consultants, or other project contractors from and against all liability in respect of and will be responsible for physical injury, loss of or damage to property and any other loss, costs and expenses however caused in carrying out such visits. It would be deemed that prior to submission of the bid/proposal, the Applicant has:-

a) Made a complete and careful examination of our above conditions for site visit and other information set forth in this tender document.
b) Examined all the relevant information as it has received from us in respect of the project.
c) Made a complete and careful examination to determine the difficulties, site limitations, and matters incidental to the performance of its obligations under our final contract agreement including, but not limited to:
d) Determined to its satisfaction, the nature and the extent of the difficulties and hazards concerning project implementation.

13. ....NS Hospital Management or its advisors, consultants, or other project contractors etc. do not accept any responsibility or liability for any errors, omissions, inaccuracies or faults of judgment with respect to information or data provided in this tender document or otherwise, with regard to the subject project or its surroundings. Although such information and data are correct and authentic to the best of our knowledge, verification thereof is the sole responsibility of the individual bidders and applicants.

14. ....**Project Theme**. The theme on which the whole design is being evolved is Convergence, Green and Competitive Open standards-based solution architecture. Hence, solution offers with green, modular, scalable, and open technologies conforming to international interoperable standards shall be given due consideration and respect throughout the procurement process. The buyer is on the hunt for Best-of-the-Breed products at most competitive prices. Therefore systems, solution designs, devices and equipment following monopolised or proprietary designs, protocols and architecture shall have the least technical attention. Some of the noticeable planning aspects of the design documentations are as follows:-

- Convergence of Technologies using Open interoperable standards
- Best-bread of modular technology, that can grow along with the demand with TCO advantage
- Green solutions – Savings in terms of power, heat, space, quietness and long-term use

15. ....**Scope of Works**. The invitation for this second phase of turnkey works involving “Site Preparation, Supply, Installation, Commissioning, Testing and FMS cum AMC Management of the associated works for a period of three (03) years from the date of project handing over / acceptance. In addition to the supply of all associated components and materials, the project also includes labour, tooling, marking materials, and miscellaneous mounting hardware of multiple OEMs involving products from various indigenous and foreign origins, its testing, documentations certifications, training etc. Considering the magnitude of the project, the buyer is permitting each bidder to have, or follow and can include acceptable variations in his solution or design approach, but strictly within the overall architecture, theme, site needs and technical specifications. It is therefore, very important for every bidder shall note and understand that the overall responsibility and the onus to propose and include any, and all items required for a complete system or solution whether or not, it is identified or mentioned in these documents, or its attachments or enclosures or annexure rests solely with the respective bidder. Accordingly, the **Successful Bidder** (hereinafter referred as **Contractor**) shall have to complete, test and commission the project at his risk and expenses.

16. ....**OEM Preference/Choice.** Inclusion of any OEM, beyond our wide range of preferred list, is subjected to the verification and approval of our Technology Consultant. Please be noted that those OEM products, that have good industry reputation, having higher rating in 3rd party evaluations, for quality, generally kept a good name by using quality aftersales support, known for higher reliability (MTBF), following higher industry standards and having good warranty support have been shortlisted as our approved OEMs. Bidders have therefore been advised to choose their product OEMs, judiciously. As regard to the inclusion of new OEM, we will be following proven validation methods to identify a legitimate 'manufacturer' from a “phony or a rebranded manufacturer”, trying to gain entry by providing false claims.

Hence, bidders, who are confident that they are representing quality OEM products, and their products can offer higher or better technical match to our promulgated specifications, can also participate in this tender, provided they have carried out the due-diligence and done validation on each of the qualification credentials mentioned here below and at Technical Specifications (Section-III) of our tender documents. More importantly, such offers must be readily available for demo or PoC samples for which we may consent a maximum timeframe of ONE week. The key criteria that shall be followed for enlisting such OEMs as our Approved Makes are as follows (Subjected to the detailed proofs submitted against each of the line item):-

a) Products adhering to either US or EU or have cleared Indian BIS or similar higher technical and manufacturing standards.

b) Have documented independent technical reviews, 3rd party product testing certificates or, product evaluation reports (of the offered products) from reputed international evaluators publicly listed and available for reference on Internet.

c) Details of patents, the OEM is holding or patent applications in progress. Simple Google search on the OEM patents (google patent search), must yield meaningful results.

d) Should have been operating in India for at least 10 years, on the same brand name dealing with similar products asked for in this project.

e) Must have Indian citizens as top executives (as India Head, MD, CEO, CTO and COO) or as Board of Directors.

f) Must produce valid clearance certificate from Government agencies that their associated data transmission systems, are not barred from operations in India.

g)……Produce certificate issued from Indian Govt that their built-in CPUs, SoC, ICs or firmware etc do not contain any backdoor or malware.

h) Submit details of the source from where they procure the raw materials for their key products.

i) List the details of other companies, that the proposed OEM has bought-out or merged-with, in last Three (03) years.

j)…….Manufacturers who have or had entries in Common Vulnerability Scoring System, (CVSS scores) or listed with US National Computer Vulnerability Database or US Government Industrial Control Security with vulnerability score of 7.5 or higher, for any of their related products in the past 3 years, will not be considered.

k) Any genuine OEM will invest substantial amount in R&D. Hence submit details with proof of the R&D division of the proposed OEM, its funding records alongwith sub-divisions and its associated manpower.

l) Highlight proofs of each line-by-line claims, showing that the choice of offer is technically superior to our promulgated minimum technical requirements.

m) OEM that has good reference installations of the products offered, in the state of Kerala and has recent user citations or client appreciation letters.

17. ....**OEM Monopoly**. As part of Technical bids, all bidders shall include the Manufactures Authorisation Form (MAF), (as per the format enclosed) for all major project components. By virtue of the openness and competitiveness of our tender specifications, if there is an attempt by any OEM to monopolise our tender, the Buyer reserves the right to restrict the number of bidders that OEM is representing, by calling for the “Prioritised Bidder List” directly from the OEM/product manufactures.

18. ....**Proprietary Terminology.** Utmost care has been taken to keep the terminologies very general, open and competitive within our documentation. However, if proprietary terminology specific to a particular OEM or Vendor is found erroneously used in any section of this tender, equivalent features shall be acceptable, provided they are technically compatible, comparable and befitting to our needs.

19. ....**Tender Queries & Pre-bid Agenda**. No assumptions and presumptions by the bidders and/or the OEMs are permitted at any stage in this project. **Each bidder would be given a maximum of two opportunities** to put forward his viewpoints and doubts or clarifications to the buyer as part of the pre-bid process. Bidders are requested to send in clarifications pertaining to the Bidding Documents in writing at least three (3) working days prior to the scheduled pre-bid meeting. These queries shall be tabled for deliberations and will be clarified during the pre-bid meeting. On completion of the pre-bid conference, the minutes of the meetings shall only be distributed to all Bidders in attendance. Hence, attendance to the pre-bid meeting must be considered as an essential PQ criterion. Please be noted that, vague queries not having reference to tender paragraphs or concerned sections may not be responded. The list of queries should be sent in one communication only and should be clearly articulated as per the format given below. Due to constraints of space, for pre-bid discussions, at most 2 representatives of each bidder would only be allowed entry (such representatives shall bring their business cards):-

#	Section # & Page No.	Para No.	Subject Heading	Clarification Sought

20. ....**Final Clarifications**. Notwithstanding the pre-bid conference, bidders will be given one more opportunity to raise their further queries (if any) within three days of the pre-bid meeting. Queries already answered or clarified during pre-bid conference shall not be entertained or answered, subsequently. Clarification of the Buyer (if common for all) shall be sent to all prospective bidders, over email provided (during pre-bid conference). Any one-to-one telephonic or email discussions in this regard or in individual capacity are to be considered only as informal. **Bidders may however note that, all incomplete/ambiguous, repeated queries and anonymous calls / queries or communications without author credentials shall be rejected at the discretion of the Buyer without recourse to further clarifications.**

21. **....Amendment of TE/BoM**. The Buyer reserves the right to alter, modify or amend any of its tender components viz, main documents, specifications, scope of works, clauses, BoM/BoQ, terms, conditions, quantities, formats etc, at own initiative or based on the requirement revisions or clarifications or response from the bidders. It is important to note that, all subsequent Addendums/Corrigendum's, if any, shall be published on our Website (http://www.nshospital.org/tender) only for public attention. Bidders may however contact our office prior finalisation of their bids for verification on the last issue of such amendments if any. Non-availability of such amendments due to internet / server problems or other reasons shall not be the responsibility of the tenderer/Buyer. If required, the Buyer at his sole discretion may exercise his option of a date extension to submission of bids, if considered essential.

22. **....Validity of Bids**. All bid submittals, including the priced offer, EMD/SD shall remain valid for One (01) Year from the date of submission.

21. ....**Bid Language.** The Bids prepared by the Tenderer and all correspondence alongwith its supporting documents relating to the bids exchanged by the Tenderer and the Purchaser, shall be written in English language, provided that any printed literature furnished by the Tenderer may be written in another language so long the same is accompanied by self-attested English translation in which case, for purposes of interpretation of the Technical bid, the English translation shall govern.

22. **Signing on the Tender Documents.** It is very important for all bidders to read and understand all the clauses and standard conditions in this tender document. Therefore, each bidder is required to sign all pages personally by his authorised signatory along with date, rubber stamp and return the same as part

of PQ bid documents. The name of person signing each page must be written clearly. By doing so, the bidder is accepting to all our Standard Conditions of the Tender, which will be subsequently termed as Contract on award of Work Order. However, if a bidder has certain points that need further clarifications the same may be put forward for discussions and as an agenda point for the pre-bid meeting.

23. ..**Bid Responsiveness.** Each cover shall be examined by our respective committees to determine whether they are complete, or the documents have been properly signed and if the bids are generally in order and all documents as per tender document have been submitted etc. Each Bidder is to highlight their Compliance or Deviation with adequate descriptions as applicable, and substantiate with eligibility details, but not limited to, the tagged (**indicate the page and paragraph numbers alongwith cross references with highlighting and website linking**) each references or submittals to our prescribed requirements. Casual compliance statements quoting just "**Complied**" or "**Yes**", or "**Noted**" or "**as given in brochure/datasheet**" etc, shall be graded as "Not Qualified". It is important for the bidders to understand that, vital details could go unnoticed, if unmarked documentations, without any cross-reference or proper tagging are dumped as submittals - for which our evaluation committee shall not be responsible. It is therefore the sole responsibility of the lead/prime bidder to ensure the submission of complete in all respect, to express and explain the details, as asked and stipulated in our tender documents. Prior commencement of each evaluation, every bid would be verified for its acceptable quality and completeness to the tender documents. For purpose of this determination, a substantially ***responsive bid is one that confirms to just enough documents as specified in the tender document without material deviations, objections, conditionality or reservations***.

24. ....**Documents & Requirements for Pre-Qualification**. The details and documentations that are required as part of bidder eligibility conditions have been documented in Section-II Please be noted that any shortage or lack of clarity in bidder submittals may lead to the disqualification of the whole Bids

25. **....Criteria for Evaluation of Technical Bids**. Cover-II, the Technical bids of those bidders who have successfully cleared the PQ evaluation stage, shall only be opened as part of T-Bid evaluation. NS Hospital shall review the technical bids of the short-listed bidders to determine whether the technical bids are substantially responsive. Bids that are not substantially responsive are liable to be side-lined and may be disqualified. It is also important for the bidders to note that, wrong presentation of facts, false compliance statements, conditions from bidder, inadequacy of documentations, or dumping of printouts or documentations etc may earn him negative markings or disqualification from further tender proceedings.

26. **....Technical Evaluation.** It is our endeavour to maintain a healthy and competitive tendering at all stages and throughout the tendering process. The Technical proposals shall be evaluated against the requirements specified in the **Section-III** of this tender document. The technical committee comprising of our Consultant, shall review the technical bids to determine whether the bids are substantially responsive and meeting the requirements asked for. Hence, solution offers with wide variance to our basic needs or divergence to overall solution designs or major deviations to our technical specifications may not be accepted or will be given negative marking. Bidder can also provide additional technical literature in a separate section labelled "Supporting Documentation" (marked point-by-point) to their response. Following details need to be essentially captured and articulated as part of technical explanations:-

(a) Description on the merits of their designs or offers, highlighting each value-additions, brief on various components that goes as part of the offer (include make and version or the OEM part-code) including pictorial descriptions and calculations, wherever applicable. Soft copies shall have the corresponding web links to the respective OEM reference pages.

(b) Extent of compliance to technical requirements specified in the scope of work, with documents tagged against each and cross references. Please be noted that non-availability of documents or inadequate details shall also invite negative making, during technical evaluation.
(c) Please note that technical evaluation is not a sales or marketing opportunity. Hence, simple advertisements, sales datasheets or similar brochures cannot be accepted as a technical submittal.
(d) Any attempts to hide the technical deviations or conceal design compromises may result in outright rejection of whole bids, without any further queries.
(e) As phase-II of technical evaluation, the Committee may further elicit clarifications from the bidders, to clear ambiguities and uncertainties, if any, arising out of the initial evaluation or the doubts cropped up during discussions.
(f) If there are still any technical doubt or ambiguity, the buyer reserves the right to call for the product Proof of Concept (PoC) sampling, (with maximum notice of one-week), of the quoted components/offered products at our site, at the bidders' cost and expense. Based on the outcome of the sampling, the buyer will retain the cleared products as technical submittals for subsequent project Quality Checks (QC) and sampling against its delivery and QA.
(g) On all matters related to product or solution technical, the opinion of our Consultant shall be final and binding.
(h) As part of QA/QC, the Buyer shall call for one sample each of the technically cleared BoM/BoQ components from the Successful Bidder (Contractor), prior placing of final work order. Such samples shall be retained (for sampling during QC inspections), till the final product supplies are accepted.

27. **End-of-Life Products**. Bidders are to note that, only "active / in-force / current" products listed under their OEM websites are to be offered and shall be accepted by the Buyer. No Products offered or supplied under the project shall be end of life (EoL), till the day of our acceptance. Due to rapid electronic obsolesces, models/versions of IT hardware and software offered shall not be older than 24 months and products introduced in the open market for over two years as on date of the bid submission, may be asked to either upgrade or renew or change to a later generation product, at no additional cost to the Buyer.

28. **Meet or Exceed Specifications.** Specifications are basic essence of a product. It must be ensured that the offers must be strictly as per our specifications. As indicated before, the Bid which is not as per our tender enquiry shall be treated as non-qualified. Our Consultant / Management has the sole discretion to accept or reject tenders based on technical specifications. Hence, the Bidders may note that only the first line of product items are offered by their OEMs (Strictly as per technical specifications) are being offered. For all line-items indicated, the technical requirements and the specifications provided in this tender are to be factored as bare minimum. Hence, the Bidders must either meet or exceed these specifications to meet the actual project requirements and its successful commissioning. But in cases where the offered specifications surpass the buyer requirements, the Bidder may clearly highlight those enhancements in his submittals to enable our evaluation committee to undoubtedly identify the offered capabilities and analyse/study the value-additions it offers, beyond tender specifications, and it would be the duty of the Bidder to complete the integration accordingly with the rest of the project components, in line his/her promised enhancements.

29. **Additional Value-Added Features & Capabilities.** It is being reiterated once again that the Buyer is aiming for an optimised, converged, Green solution with highest possible value-added features and capabilities. Therefore, bidder may also submit a statement highlighting their value additions or add-on features over and above their technical compliances, explaining the overall utility, in the context of Buyer operations/functioning. However, if there is extra cost implication or licenses (for those value-added features), the same shall be clearly indicated at the respective section (against Optional items) of both the

bids. If there is no mention of the cost, the buyer assumes that the stated value-added feature is bundled as part of the offered pricing, and the Contractor shall have to deliver his promised features at the time of delivery and demonstrate during the project testing/acceptance. However, please be noted that, it is the right of the Buyer to accept or reject these statements based on the utility of these features to the context of buyer operations or working. Accordingly, the features that the Buyer considers as "value-additions", may have bonus points during our technical evaluations.

30. **Revised Price Bids**. Being a convergence project based on the individual product capabilities, the overall solution architecture the technical components and commercial submittals of each 'bidder' may vary slightly. Therefore, each bidder is required to submit their unpriced and priced offers based on the promulgated format, alongwith additional optional components its services and other line items (clearly indicate item by item, site fit-out cost, last-mile cabling, civil cost, installation and commissioning cost, training and system configuration cost etc) that could impact their project costing significantly. Please be noted that the un-priced BoQ shall be a ditto copy of their commercial proposal – but, without any indication to pricing. It must however indicate the Make, Model, Version and brief descriptions of the items offered. All items required for the installation and integration as a composite, turnkey project is deemed to be included in the unit price quoted, unless otherwise indicated and quoted as a separate line item. Based on the outcome of ensuing technical deliberations, the buyer may (or may-not) call for a revised pricing from all the qualified bidders on a freshly revised un-priced BoQ, after inclusion of additional line items, if considered essential.

31. **....Commercial Bid Evaluations.** The Price bids of only the bidders who meet the Technical Eligibility criteria would be opened by the committee constituted by NS Hospital. The date and time of the opening of Q-Bids shall only be communicated to those bidders, clearing our technical evaluation. The Bidders have to comply strictly as per the promulgated price bid format in MS excel format. The offered price for each item shall be the net amount, all inclusive of ex-factory price per unit. packing, forwarding, freight, transit insurance, excise duty, other duties, if any, including loading/unloading, storing (demurrage), installation, configuration as per Buyer requirements, commissioning, testing and acceptance charges etc. Further as part of labour, price quotations are also to include the furnishing of all associated work materials, equipment, testing, certifications, documentations, three-years product replacement warrantee, documentation, tools, and the provision of all labour obligations and services necessary for proper completion of the work, except as may be otherwise expressly provided in our contract documents. The NS Hospital shall not be liable for any costs beyond those proposed herein and awarded. The GST rate as applicable are to be indicated at respective cells of the sheet provided. It is the duty of each bidder to stamp and seal the price bids suitably in a separate cover. Such cover shall be signed at each cover joints, taped at every edge and corners to prevent any accidental opening during handling. Any indication of price factor or part thereof in documentations other than price bid packet shall result in total disqualification and rejection of that particular bid. If during the course of execution of the project any minor revisions to the work requirements like technical specifications, equipment sizing, etc. are to be made to meet the goals of the Project; such changes shall be carried out within the proposed price. If any deviation has a major impact on the Project Cost, the buyer shall take appropriate decision and such decisions would be binding on the Contractor.

32. **Licenses**. Based on the characteristic licensing regime of OEMs and that of the proposed hardware solutions, the bidders are requested to <u>list down all the licenses (alongwith its additional commercial charges) with its periodicity (one-time, quarterly, half yearly, annual, till warranty/guarantee etc) as applicable</u> alongwith their respective offers (unpriced in technical) and costing in price bids). This list must also include the unpriced/priced details on patches, renewal charges, product upgrades and version revisions etc. This essentially means <u>no hidden or bundled pricing</u> on licensed features or capabilities shall be permitted as part of this procurement process.

33. **Price Stability.** Prices quoted in the Bid must be firm and final and shall not be subject to any modifications, on any account whatsoever. The Bid Prices shall be indicated in Indian Rupees (INR) only. The Price Bid should clearly indicate the price quoted without any ambiguity / qualifications whatsoever and should include all applicable taxes, duties, fees, levies, and other charges as may be applicable in relation to the activities proposed to be carried out. Should there be a change in applicable taxes, the actual taxes on the date of billing would prevail. If price change is inevitable due to any factor external to the bidders, the bidders may be given chance to submit revised Bids in a separate sealed cover. Decisions of the buyer shall be final in this regard. Notwithstanding the above, subject to the limits set by CVC guidelines, we the buyer (NS Hospital management), also reserves the right to negotiate the commercials with the selected Bidder and seek revised commercial bid, in whole or part thereof.

Concessions Permissible under Statutes.

34. Bidder, while quoting against this tender, must take cognizance of all concessions permissible if any, under the statutes and ensure the same is passed on to the Buyer, failing which it will have to bear extra cost. In case Bidder does not avail concessional rates of levies like customs duty, excise duty, sales tax, etc. the buyer will not take responsibility towards this.

35. **Exemption in Tender Fee & EMD by Cooperative agency, under Government of Kerala.** The buyer being a cooperative registered agency, would like to extend waiver of tender mandates, as a special gesture for all those bidders registered as cooperative agency, under Government of Kerala. Hence, a cooperative agency, registered with Government of Kerala would be exempted from the submission of Tender document fee / EMD / Bid security deposit on production of requisite proof in the form of valid certification from Kerala Government – specially for the tendered item/services.

36. ....**Criteria for Evaluation of Price Bids.** The commercial bids of only those bidders, who have cleared the Technical milestones shall be opened and reviewed for determining the lowest bid (L1). Other details w.r.to the commercial bid evaluation are as follows:-

a) If the number of bidders qualifying the technical round is found insufficient or inadequate, the top one or two bidders scoring highest aggregate in technical criteria's, may be declared eligible for Commercial competition.
b) All bidders are to quote for the one-time supply, installation cost of the project (CAPEX) alongwith fault replacement warrantee services (Defect Liability Period), as per the price bid format.
c) The bidders are to clearly indicate the cost and tax breakdown for each of their project components, including labour. Bundling of prices are not permitted. However, all cumulative totals may be rounded over to the nearest rupee.
d) The Bidder should abide by all terms and conditions specified in our tender documentations. Hence, our evaluation committee shall be directed to disregard, inclusion of any Terms and Conditions as part of individual bidder offers. More importantly, our committee is empowered to reject all such offers, forfeiting their bid security deposit.
e) The bidder with lowest Total Commercial Quote (L1) shall be declared as the Successful Bidder (Winner). (If there are significant difference in pricing for a particular project component from same OEM, between various L1 ~ H1 bidders, the management is empowered to hold a component-wise, price negotiation or discussions or clarifications, solely towards the commercial advantage of NSH.)

37.....**Rectification of Typo Errors.** All arithmetical and clerical errors in the Bids shall be rectified on the following basis.

a) Tampering of the promulgated price bid format in any form is not permitted. However, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and shall be considered for further calculations.
b) If there is a discrepancy between words and figures, the amount in words shall prevail.
c) If there is conflict between print document and its soft-copy, the print copy shall prevail, unless another ink-signed copy from an approved authority is submitted within the promulgated time-frames.
d) In case of discrepancy in computed prices, the lowest combined value of individual units' costs shall prevail.
e) No over writing or white ink corrections are permitted in commercial bids. Such bids shall be rejected.
f) Corrections if any are to be circled and endorsed by the same authority, who had signed those bid portions.
g) If the bidder does not accept any of the above, or the correction of errors, their bid shall be rejected, and its bid security will be forfeited.

38. **....Obligations.** Presence of bidders are welcomed during the opening each bid. Every bidder present at the opening of bids is free to express his/her (their) difference of opinion (if any) on/to the issues mentioned at his (their) competitors tender during the opening of bids, **but only in writing**. Respective committee shall examine the merits of each such request and shall declare the decision prior qualifying the bids. The decision of the Buyer shall be final. Once the covers are declared qualified, it considered that the Bidder is agreeing to all terms and conditions of this tender and therefore the contract between the Contractor and the Buyer shall be agreed upon accordingly. The award of the work contract shall obligate the Contractor to comply with the foregoing indemnity provision; however, the collateral obligation of insuring this indemnity must be complied with as set forth. Any deviation by the Contractor thereafter, could not only invoke 'Bid Security' clauses, but also may invite blacklisting the bidder from all subsequent tenders for a period of two years.

39.....**Bids Rejection Criteria.** At any stage of this tender evaluation, the NS Hospital shall be fully entitled to disqualify any bidder or for any reason whatsoever including but not limited to the following general reasons:-

a) Incomplete submittals. Failure to submit the requisite information (including any additional information requested by us) and supporting documents <u>within the required timeframe</u>. Or bids submitted with insufficient documentary proofs.
b) Bids submitted without or with improper EMD and/or tender cost.
c) Bids received after the prescribed time & date for receipt of bids;
d) Material or documentary inconsistencies in the information submitted.
e) Willful misrepresentation in any document provided.
f) Bids without signature of person (s) duly authorized on required pages of the bid;
g) Bids without power of attorney or its certified true copy.
h) Any effort on the part of a Bidder to influence the bid evaluation, bid comparison or evaluation results or decisions;
i) If the information provided by the Bidder is found to be incorrect / misleading / fraudulent at any stage / time during the evaluation process

j) If a particular bidder or applicant or entity submits more than one proposal either independently or as a part of different Consortium, Partnership Firm etc.

k) Hand-written Documents, Erasures or Alterations. The offers containing erasures or alterations shall not be considered. All hand-written material, corrections or alterations as part of the submittals shall be rejected outright.

In the event NS Hospital disqualifies any bidder or applicant on above conditions, it shall not be required to disclose the reason for such disqualification.

m) Technical Rejection Criteria

i. Incomplete submittals
ii. Bids submitted with insufficient documentary proofs.
iii. Information provided by the Bidder is found to be incorrect / misleading at any stage or time during the tendering process.
iv. Technical Bid containing commercial details or its indications.
v. Revelation of prices in any form or by any reason before opening the commercial bid.
vi. Failure to furnish all information required by the tender document or submission of a bid not substantially responsive to the tender document in every respect.
vii. Failure to provide adequate technical proofs for the compliance statements with their pages tagged marked and highlighted or attempts to dump large details that have no consequence to our procurement process.
viii. Any effort on the part of a Bidder to influence the bid evaluation, bid comparison or evaluation results or contract award decisions.
ix. Any attempts to hide the technical deviations or conceal design compromises may invite either total rejection of whole bid or may carry negative scoring for those components.
x. Bidders not complying with the technical and general terms and conditions as stated in the tender documents.
xi. Failure to submit UNPRICED bid format with their OEM and Product details such as part codes.
xii. Bids with terms and conditions that cannot be accepted by NS Hospital/buyer.
xiii. Bids that does not confirm or conform to our project timelines indicated, or failure of the bidder to appear before the evaluation committee or failure to conduct TEP or POC or Demo as demanded by the technical evaluators
xiv. If the information provided by the Bidder is found to be incorrect / misleading / fraudulent at any stage / time during the evaluation process

n) Commercial Rejection Criteria

i. Incomplete price bid
ii. Any attempts to alter our promulgated price bid format or Bids that do not conform to the tender's price bid format.
iii. Bundled pricing
iv. Overwriting or white ink corrections, if any
v. Price bids with bidder's own terms and conditions
vi. Any attempts to mislead the evaluators or bids with blank GST or levies as applicable.
vii. If the information provided by the Bidder is found to be incorrect / misleading / fraudulent at any stage / time during the evaluation process
xv. Any effort on the part of a Bidder to influence the bid evaluation, bid comparison or evaluation results or contract award decisions.

40. **Buyer Rights**. We the Buyer reserves the right to:-

a) Negotiate with the Bidder whose offer is the lowest evaluated price for further clarifications and possible reduction of prices.

b) Insist on quality / specification of materials to be supplied.

c) Modify, reduce or increase the quantity requirements beyond to an extent of the tendered quantity.

d) Based on our site operational and functional priorities, we may request the successful bidder to supply the items on phased manner and its payments may also be progressed accordingly.

e) Change the list of areas of work from time to time based upon the requirement of the purchase.

f) If delivery performance of the Contractor is not as per the schedule, then we the buyer reserves the right to act against them.

g) We reserve its right to withhold any amount for the deficiency in the quality or quantity aspect of the ordered items supplied.

41. **Right to Accept or Reject Any or All or Part Bids.** The buyer, NS Hospital reserves the right to accept any bid and to annul the tender process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidders or any obligation to inform the affected Bidders.

42. ....**Payment Conditions.** Upto **20%** of the project cost can be paid as project advance, against the submission of Bank Guarantee for the equal amount. (Please note that this advance is not linked to any other Bank Guarantees asked in this document). Further **60%** of the total project amount, along with the return of the Bank Guarantee for the project advance shall be cleared within respectable time on supply of complete project BoM/BoQ at each of our site. Balance **20%** shall be paid on completion of installation, integration, Final Acceptance Tests (FAT), QA and submission of Performance Bank Guarantee of 5% total project cost. Each of these payments shall be made only against delivery challans and invoices duly signed with official seal and date by authorized the buyer's officials or our Consultant. The Performance Bank Guarantee shall be periodically renewed by our Contractor and shall be released after the expiry of defect liability period of one year from project closure or handing over, whichever is later. An unexcused delay by the vendor in the performance of its installation and project commissioning obligations shall render him liable to any or all of the following penalties: -

43. ....**Security Deposit (SD).** The successful bidder (Our Project Contractor) will have to furnish a **Security Deposit** in the form of **Bank Guarantee** equivalent to 5% of the value of the contract for due / proper fulfilment of the contractual terms and conditions, valid for a period of 1 year from the date of the agreement obtained from a nationalized / scheduled bank. This Bank Guarantee shall be released progressively over running bills @ 25% or on the submission of SD. In the event of delay in the supply and installation within a stipulated period, penalty @ 2% per consignment per month or part of month thereof for the delay at our project site. The Buyer shall be at liberty to accept/reject/cancel the contract for delay supplies. In the events of the cancellation of contact due to non-supply of items, the entire security of the vendor will be forfeited. The agreement along with the bank guarantee for 1 year should be submitted within One Week of the date of issue of Purchase order. On receipt of the SD, the Earnest Money Deposits (EMD) submitted by the Successful Bidder, shall be refunded (without interest) within 30 days of submission of SD. Failure of the Successful Bidder to furnish the Performance Guarantee or execute the Agreement within the prescribed time shall cause the EMD of the Successful Bidder to be liquidated.

44. ....**Liquidated Damages (LD)**. In the event of the Contractor's failure to complete the works on time, or delay in supply the stores/goods and conduct trials, installation of equipment, training, documentation, over even handing over etc as specified in this project/contract, NS Hospital may, at their discretion,

withhold any payment until the completion of the contract. Accordingly, we the Buyer may also deduct from the Contractor as agreed, liquidated damages up to the sum of 2.5% of the contract price of the delayed or undelivered stores/services or 0.5% per week of delay for every week of delay or part of a week, subject to the maximum value of the Liquidated Damages being not higher than 10% of the value of delayed stores/ services or test rejections. Please be noted that, the product/material or the work is observed to be substandard would invite invoking of either LD clause or Performance Bank Guarantee and a case of rejection even after installation.

45. ....**Performance Bank Guarantee (PBG)**. The PBG is defined as "the operating capabilities and maintenance and reliability characteristics of the project necessary to fulfil the envisaged technical and conceptual requirements." They are performance elements (i.e., reliability, availability, security and maintainability specifications) that are documented as part of this tender document. As a condition precedent to the acceptance of the project, our Contractor shall submit requisite unconditional irrevocable Bank Guarantee, in our prescribed format, within 15 days of project acceptance. The Bank Guarantee shall be equivalent to 5% of the Total Project Cost (Net) and must be issued by a Nationalized/Scheduled Commercial Bank. The Performance Bank Guarantee shall be valid for the term of the resultant Agreement and shall be renewed and maintained as necessary by the SI for the term of the resultant Agreement, and extensions if any. On receipt of the PBG, the SD submitted by the Successful Bidder, shall be refunded (without interest) within 30 days. The Performance Bank Guarantee may be liquidated by the buyer as penalty/liquidated damages resulting from the successful bidder's failure to complete its obligations under the performance warrantee clauses of our Agreement. The Performance Bank Guarantee shall be returned by Buyer to the Contractor within One year of the term/expiration of the resultant Agreement after applicable deductions as per the Agreement, if any. The procedure for submitting Performance Bank Guarantee is outlined below:-

a) The Contractor shall submit a Performance Bank Guarantee (PBG) within 15 (Fifteen) days from the date of project acceptance. On exceptional cases, an extension of time for submission of PBG beyond 15 (Fifteen) days and upto 30 days from the date of acceptance may be given by the Secretary, NS Hospital, who is our competent authority. However, a penal interest of 18% per annum shall be charged for the delays beyond 15 (fifteen) days i.e. from 15th day after the date of issue of LOA.

b) In case the Contractor fails to submit the requisite PBG, even after 30 days from the date of project acceptance, the failed Contractor shall be Blacklisted and debarred from participating in any further tender process for two years.

c) The period of FMS starts with the first year of operation. The essential difference between the first year and the subsequent years is that the first year FMS includes replacement warrantee for all those defective components and project devices.

d) The Performance Guarantee (PG) shall be 5% of the contracted CAPEX value (without the FMS component of the tender).

46. ....**Penalty Clause**. In case of complaints from various quarters (from any Buyer representatives, departments, staff or by other site workers) either on the contracted services, or quality of work, or on the worker behaviours or contractor staff discipline etc, during the contract period, the following penalty shall be imposed:-

#	Complaints	Warning / Penalty
A	First Two complaints	Verbal warning
B	Third and Fourth Complaint	Written Warning
C	Fifth and Sixth Complaint	Deduction of 5% amount from the Security Deposit (SD)

D	Seventh Complaint	Issue of show cause notice and termination of contract after hearing the convened party. The SD may also be forfeited.

47. ....**Delivery & Commissioning**. The Supply/Installation of the ordered project components shall be completed at our site within 12 weeks from the issue of Purchase Order. The entire project commitments (including its testing, training, documentations and QA etc) must be completed, (as per the terms and conditions listed in this document) within 90 days of placement of Purchase Order.

48. ....**Duties & Responsibilities of Successful Bidder (Contractor)**. The successful bidder, shall be nominated as our project Contractor by the award of the work order, within a reasonable time. Some of the duties, responsibilities alongwith the definitions of our project Contractor are as follows:-

a) **Work Contract**. All the tender instructions, terms, guidelines, conditions and directives promulgated by us from time to time in the form of tender documents, corrigendum, minutes of meeting etc, deemed to have been accepted by the bidder in its totality, when the bidder submits his bids. Accordingly, the contract shall deem to have been concluded by the 'Acceptance of Tender' issued in the form of a Purchase Order. The acceptance may be communicated to the Contractor by fax or hand / or registered / speed post. The Contractor shall acknowledge the receipt of the NS Hospital Work Order / Purchase Order or Intend, by issuing a Letter of Acceptance (LOA) to the Buyer within seven working days of its receipt. However, please be noted that either any delay beyond one week or non-acknowledgement on the part of the Contractor may result not only in forfeiture of his EMD but also may result in declaration of next competitive (L2) bidder, as the successful bidder and our contractor.

b) Hiding of facts, misrepresentation, corrupt practices by the Bidder if revealed at any stage, would amount to forfeiture of security and subsequently the contractor and his firm may also be blacklisted.

c) The Contractor shall be responsible for entire scope of work mentioned herein from start to finish, its allied accessories, security and safety of his labour, and all other associated apparatus necessary to completely commission, test, and handover for acceptance to NS Hospital. The project closure or finish means, the handing over of the project to NS Hospital (subject to its quality and acceptance).

d) Due to the magnitude of the project, based on the progress, the Contractor may be directed to supply the ordered BoQ/BoM in a phased manner. Contractor is required to comply with this requirement.

e) The Contractor shall not employ any minors or personnel with criminal cases pending against them at any part of the project either directly or even as indirect assistants of his sub-contractors.

f) The Contractor shall install, integrate and commission the works/project infrastructure including its allied works as per our approved site deployment needs, within the specified time period, in line with the requirements specified in this tender.

g) The Contractor is also responsible for undertaking the entire conduiting and its concealing for the project component of Nurse-call solution, and other minor works as part of his scope of work. Towards this, only white PVC conduit is permitted. However, no case-and-capping type of conduits to be used.

h) **OEM Directives**. The Contractor shall carry out and complete the said works in conformity with each of his chosen OEM documentations, manufacturer guidelines and with the direction of and to the satisfaction of the buyer's site representatives/Consultant. Where manufacturer has furnished specific instructions relating to the material/equipment installation, workmanship, operations and usage in this project, covering points especially not mentioned in these documents, such instructions shall be strictly followed for all such cases. In case of technical conflicts, our Consultant opinion may be requested and his decision shall be final.

i) The spares, components, cables, wires, connectors, interfaces, and each system parts, alongwith their naming conventions differ from OEM to OEMs. Hence, it shall be the responsibility of the Contractor to provide all the necessary hardware and allied end-to-end interfaces to establish the envisaged functional requirements and operational aims of the project. If the Contractor is unable to prove or provide the requisite project needs within the stipulated time schedules, he shall have to replace such components with suitable substitutes that can satisfactorily integrate, interoperate and operate in accordance with the project requirements, to the approval and satisfaction of our technical committee/Consultant.

j) The Contractor is responsible to install and configure the entire ELV infrastructure associated with the project viz, ICT, AV, IPTV, Signage components and its allied systems like Nurse-call, Counters etc to work as a composite functional system. Towards this, the Contractor is responsible for the supply of all the allied work / installation materials / accessories / consumables (e.g. screws, clamps, fasteners, ties anchors, tray supports, grounding/bonding strips, wires, labelling, termination kits etc.) as and where necessary to complete project, which may otherwise or cannot be detailed in any tender documents.

k) The Contractor shall furnish all labour, materials and equipment at his risk and expenses as shown under the work schedule including its transportation and incidentals necessary for supply, installation, testing and commissioning of the complete system as described in the specifications and documentation. This also includes any material, systems, devices, appliances and incidental work not specifically mentioned herein or noted on the documents as being furnished or installed.

l) The Contractor shall be responsible for making all necessary arrangements for shifting the men, materials and the contracted systems, without spoiling the building aesthetics, operating environment and paint finishing or causing any disturbance to ongoing other works. He will under his own expenses make good all structural damages, surface aberrations / scratches, and repairs to interior finishes (caused due to his work) as part of his contract duties and responsibilities.

m) Depending on the individual product capabilities, options available at site, product limitations, the bidder has been given freedom to implement work, as described in our tender, without deviations to technical criteria's, manufactures guidelines and architecture enumerated in this tender. Contractor is therefore, instructed to ship/supply only the actual quantity(ies) as required for the project and not to dump unwanted items. NS Hospital reserves the right to return any over-shipment of items in excess of the project requirements at the Contractor's expense.

n) **Quite Operation & Vibration Isolation.** Owing to the reasons of being a healthcare and wellness project, all equipment being supplied or installed shall operate under all conditions of load with acceptable sound levels and standards of vibration. In case of system sound or vibration noticeable outside our permissible limits or annoyingly noticeable inside its own room shall be considered objectionable; such condition shall be corrected by the Contractor at his own expenses.

o) It is extremely important for the bidder that each job is evaluated, tested and verified at each installation process, prior intimating his readiness for the User testing process. He must therefore ensure that, the proposed system is fully operational and functions with feature requirements as specified in these documentations, prior calling the attention of Buyer for testing and handing over.

p) It is the responsibility of the Contractor to ensure that his equipment gets the requisite quality of electrical power with the right levels of signal reference, where required at his risk and expenses.

q) The Contractor must ensure that all systems are in good working condition and free of short circuits, ground loops, signal noise and excessive system noise or any fault affecting its efficiency / quality / life.

r) Where, existing power supply, or/and earthing is observed inadequate, it is the responsibility of the Contractor to liaise with his electrical counterpart and/or the phase-I contractor, keeping the buyer and the consultant informed prior switching on the system.

s) All bidders shall include product warrantee charges (if any) for the first one-year, on Next Business Day (NBD) replacement basis for all their supplies.

t) Please note that any solution that operates or licensed out from Internet based cloud environments are not acceptable, since the buyer aims to setup his own Intranet based private cloud environment.

u) Where required, the Contractor is required to draw the Power cabling from the nearest power socket or source to the project device that may involve, cable laying, fixing, installation, including mounting of electrical box/ boards, MDB, MCB and its associated civil works etc, on as required basis on his expenditure.

v) It is extremely important for the bidder that each job is evaluated, tested and verified at each installation process, prior intimating his readiness for the QA process. He must therefore ensure that, the proposed system is operational and with feature requirements as specified in these documentations, prior calling the attention of Buyer for testing or handing over.

w) The Contractor must take adequate electrical measures to ensure that his equipment gets the requisite quality of electrical power with the right levels of reference, where required at his risk and expenses.

x) The Contractor must ensure that all systems are in good working condition and free of short circuits, ground loops, signal noise and system noise or any fault affecting its efficiency / quality / life.

y) Where, existing power supply, or/and earthing is observed inadequate, it is the responsibility of the Contractor to liaise with our local rep and resolve the issue earliest keeping the NS Hospital technical committee and our Consultant informed.

z) At the time of commissioning the Contractor must provide user/owner's manuals; manufacturer's operating instructions, and a complete equipment list.

aa) Prior handing over, the Contractor must provide complete as-installed system schematics, (in AutoCAD or MS Visio) with detailed labelling, connections and terminations.

bb) In case of any doubt / conflicts in this tender document, please be noted that, latest instructions or specifications outlined or clarifications (if any) issued, shall supersede all other sections.

cc) The project staff of NS Hospital shall at all times have access to the work site and the contractor shall provide proper facilities for such access and for inspection. The contractor shall not stop any work due to the site visit by NS Hospital staff or our Consultant. However, any shortcomings observed by these personnel are to be made good by the Contractor at the shortest possible time / prior intimating his readiness for testing. Shall the Contractor close the work prior to re-inspection, the Contractor may be asked to uncover such work for inspection at no cost to the NS Hospital, and then re-cover the work according to the specification and instructions contained therein.

dd) Contractor shall provide protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensure the entire work and finishes are clean, without any damage or deterioration at the time of substantial completion. On completion of this activity, the Contractor shall notify the NS Hospital in writing, (at least a week in advance) when the work is ready for inspection. The NS Hospital committee shall inspect the work as expeditiously as possible after receipt of notification from the Bidder.

ee) The Contractor shall not be allowed to change his/her products or product OEM without formal / written approval of the Buyer or our Consultant.

ff) On any technical matters, the decision of our consultant shall be final.

gg) As part of workmanship, no Cables related to the work components are to be visible to the naked eye, on completion of works

hh) Cabling shall have to be undertaken over the shortest possible routing. No claim for any cabling works would be entertained.

ii) No additional pricing claims will be entertained, once the work order is placed.
jj) The project term means, the period till the warrantee of the project works gets completed.

49. **....Project Manager.** To ensure the correct adherence of the directives listed above, the successful bidder will have to position and provide a full-term, on-site, full-time, Project Manager who will act as a single point of contact and communication for all activities regarding this project. The Project Manager shall be capable of making on-site decisions regarding the scope of the work and any changes required by the work, in discussions with NS Hospital or the Consultant. The Project Manager will be totally responsible for daily work updates, all aspects of the work, including the first line Quality Control (QC) and shall have the authority to make immediate decisions regarding implementation or changes to the work. The Project Manager must be a management employee and cannot be a contractor worker involved in personally performing project/craft installation works.

50. ..**Project Progress Monitoring & Review.** Regular meetings, at least once a month or as per user or consultant requirement would be held for monitoring the progress and take decisions on site. The first meeting shall be held within one month of placement of order. Further dates shall be mutually decided for the later meetings. Contractor is to ensure that appropriate representatives with authority (decision making capabilities) viz, Director, Vice president, CEO/CTO or CMD are deputed for such meetings. The progress of work based on the approved PERT chart for implementation plan of the project shall be discussed at every such meeting.

51. **Option Clause.** This contract has an Option Clause, wherein NS Hospital at its sole discretion may exercise an option to procure an additional 60% of the original contracted quantity in accordance with the same terms & conditions of the present contract. This clause may be exercised, in case of any similar work or its part thereof, but of lesser magnitude arises during the currency of contract. Option clause however cannot be linked or clubbed with Repeat order or Tolerance clauses.

52. **Repeat Order Clause.** This contract has a Repeat Order Clause, wherein NS Hospital can order upto 50% quantity of the items, for the enhancement of the present project. This can be exercised at any time under the present contract and within eight months from the date of successful completion of this contract. As in the case of Option clause, the contracted cost, terms & conditions etc shall remain the same. It shall be entirely the discretion of NS Hospital to place the Repeat order or not and cannot be linked or bundled with the Option clause or Tolerance clause.

53. ....**Tolerance Clause.** To account for the needs of change management, during the period starting from issue of tender till completion of the project/contract, NS Hospital reserves the right to vary upto 25% plus/minus (increase or decrease) the project quantities of the required goods/items upto that limit without any change in the terms & conditions and prices quoted by the Contractor. While awarding the order, the items or its quantity ordered shall be increased or decreased within this tolerance limit. This clause may be executed at the sole discretion of NS Hospital.

Delivery, Storage & Handling

54. ....**Inspection & Quality Control Tests.** The Buyer reserves the right to carry out pre-shipment inspection by a team of our technical officials, of any of the existing live installations of the Contractor, referred to in the Technical Bid or demand a demonstration of the solution proposed on a representative model in the bidder's office. Further, the Buyer's right to inspect, test and, where necessary, reject the Products after the Products' arrival at the destination, shall in no way be limited or waived by reason of the Products having previously been inspected, tested, and passed by our representative, prior to the products' shipment from the place of origin.

55. **....Stores Management.** It is the Contractor's sole responsibility to protect items/materials during transit, insure, storage, and handling to prevent damage, theft, soiling, and misalignment etc. Do not store the project work materials or equipment where conditions fall outside manufacturer's recommendations for environmental conditions. Please be noted that we shall do not permit install of any visibly or physically damaged components, as part of our project works. You will be asked to remove such items from our site and replace damages with new components with the consent and approval of our consultant. At the sole discretion of NS Hospital management, water, space and electricity may be provided on chargeable basis. However, the Contractor is to note that the handling and accounting of entire project items, components, work materials and men shall be solely the responsibility of Contractor till project completion and handing over.

56. **....Safety & Security.** The safety and security of the items, project components and stores till its handing over, alongwith his associated worker force, including that of his sub-contractors, are the sole responsibility of our Contractor. He shall take all the necessary precautions and bear the sole responsibility for the safety and security practices and methods employed in performing the work. The Contractor shall at all times respect and comply with the regulations set forth by national, state, and local laws, rules, and regulations concerning "workers safety and security", and applicable labour laws and standards governing in this respect.

57. **....Indemnification.** The Contractor shall defend, indemnify and, protect NS Hospital, its officers, staff, workers, consultants, employees, servants, agents, successors and assigns, harmless from and against all claims, including without limitation claims, liabilities, losses, suits, damages, costs, judgments, actions, administrative proceedings, costs, penalties, fines, damages and expenses (including, but not limited to, advocates' fees, consultants' fees and court costs) ("claims") for bodily injury, harm, sickness, disease and death and for property loss or damage, to the extent arising from or on account of any injuries, death or damages, received or sustained by any person or persons, during or on account of any operation connected with this contract; or by consequence of any negligence in connection with the same; or by use of any improper materials or by or on account of any act or omission of said Contractor or its subcontractors, agents, servants, or employees or the Contractor, sub-contractor, or Contractor's failure to comply with the regulations stated herein or documented in statuary regulations. The Contractor further agrees to indemnify and hold harmless the NS Hospital, its site/project representatives, other stakeholders or employees, against claims or liability arising from or based upon the violation of any national, state, local, or other applicable laws, bylaws, ordinances, or regulations by the Bidder, its agents, sub-contractor, associates, or employees.

58. **....Liability & Insurance.** The Contractor shall assume the full responsibility, duty, obligation, and expense of obtaining and maintaining necessary insurances and liabilities, associated with above.

59. **....Repairs to Property Damage.** During his work, any damage to existing facilities, installation and/or service by the Contractor, his agents or vehicles or subcontractors or workers, employees, shall be repaired and left in as good condition as original. All repairs shall be accomplished at no cost to the Buyer.

Project Handing Over

60. ....**Inspection, Testing & Acceptance.** Inspection and Acceptance will be at the work site and upon successful installation unless otherwise provided. If the materials or services supplied to the NS Hospital are found to be defective or do not conform to the specifications, the NS Hospital reserves the right to cancel the contract upon written notice to the Vendor and return products at the Vendor's expense,

based upon other terms of the Contract. In this connection, conditions mentioned under Security Deposit and Liquidated Damages are also relevant.

61. ....**Systems & Other Software**. The Contractor shall provide complete and legal documentation of all subsystems, licensed system hardware and software, licensed utility software and other licensed software. The Contractor shall also provide licensed software for all software products, whether developed by them or acquired from others. The Contractor shall also indemnify the Buyer against any levies/penalties on account of any default in this regard.

62. ....**Testing & Payment Clearance.** The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context "good quality" means the work shall meet industry technical standards and quality of appearance. The final payment of the **Low Volt Works** project will be disbursed when the entire ELV Works work deemed acceptable and complete on satisfactory testing and have met the milestones indicated in paragraphs below.

63. **....Workmanship Inspection**. On completion of system testing and proving, post clearances from the system integrator, the contactor will undertake the dressing of all racks in accordance with the structured cabling norms and standards. The work performed under this specification shall be of good quality and performed in a workmanlike professional manner. In this context "good quality" means the work shall meet industry technical standards and quality of appearance. The Buyer reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds. Accordingly, the entire work, including its all cable runs wall plates, racks, cable runs, dressing, terminations, and distribution frames etc shall be inspected. The workmanship part of the acceptance tests includes inspection of equipment and devices for mechanical damage (abrasions, painting, dents, dirt, dust etc) and shabby civil works like finishing, etc.

64 **.....Test Rejections**. In case of test rejection or repeated failure, post commissioning, LD charges shall be deducted subject to a maximum of ten percent of project cost. In case, any portion of system does not meet the specifications, the Contractor is duty bound to correct the deviations at the shortest possible time and repeat applicable testing at no additional cost to the owner.

65. ....**System Run-in.** Run-in shall commence once the Contractor intimates his readiness for testing. This involves near completion of all envisaged works and the project is handed over to the Buyer. These include the successful migration of the existing servers and services to the new NS Hospital DC and the entire system is live and available for testing. However, system run-in shall not be considered as project has been tested or ready for handing over. It is the duty and responsibility of the Contractor to formally inform the buyer (in writing) his readiness for the commencement of project testing, once 95% of project work has been completed. This means, almost all contracted jobs viz, site preparation, supply and installation of components and making the systems to work as one composite unit, as part of NS Hospital ELV Works, (ie except documentations and user training) has been completed and the system is available for run-in. Each bidder shall prepare a detailed system Acceptance Testing Plan (ATP), based on his solution on offer, its technical specifications and the feature sets requested by the buyer in this tender. NS Hospital shall review the submitted acceptance test plan with the consultant after taking in to account the views and suggestions from the end-users and if required concerned OEMs. Accordingly, during the testing process the Contractor shall be required to demonstrate all the services / features / functionalities as requested in our tender documents.

66. ....**Final Acceptance Testing (FAT)**, Following are considered as few prerequisite for carrying out FAT activity:-

a) Contractor shall inform the buyer, NS Hospital in writing for the commencement of testing at least one week in advance. This request may include the timelines, details of test procedure and schedules with cut-off dates (acceptance test plan) of each associated works that are to be delinked from FAT, with adequate reasons. However, delinking those sections shall be subjected to the approval of the Buyer, based on which a final clearance shall be given. However, in the event the Contractor is not able to complete the installation due to reasons (outside the control and purview) like, non-availability of bandwidth from the bandwidth service providers, or power supply, the Contractor and NS Hospital may mutually agree and redefine the FAT clauses and timelines accordingly.
b) The Contractor shall submit the detailed acceptance test plan for the internal discussions and approval by the Buyer, at least THREE weeks prior initiation of his request for FAT.
c) The Contractor is required to complete all his contract obligations, except documentations and user training, prior making such request with the Buyer.
d) During the tests, the Contractor shall be asked to demonstrate the features / capabilities / facilities / functionalities, at random as mentioned in various sections of these tender documentations.
e) It is the responsibility of the Contractor to arrange any/all test equipment as required for the performance verification or functional test of each of the subcomponents, systems and devices. Contractor shall also provide documented test results.
f) Successful migration of all existing servers, working IT resources, our running / operational applications and web services is considered as a major milestone for commencement of testing.
g) In case of any doubt, the Contractor shall be asked to undertake a security audit of the network, from a reputed and certified 3rd party agency.
h) Contractor is required to position the services of OEM representative of the system manufacturer, in case his staff is unable to test or demonstrate that the system functions to the satisfaction of Buyer.
i) Contractor is to ensure that all tests shall either meet or exceed the asked functional requirements and technical specifications.
j) It is the responsibility of the Contractor to ensure that all the project components, devices, systems and equipment has an electrically 'clean' earth at all times. Clean earth is defined as a conductive element with not more than 1-volt RMS potential difference between it and the real earth down below.
k) All electrical hygiene related aspects shall also be part of the inspection and testing. Earthing, grounding and bonding of cables and peripheral equipment shall also be inspected and shall conform to leading industry standards to eliminate noise induction and achieve optimum system performance.
l) Delays associated with testing and acceptance is considered as Contractor and liable for the imposition of LD Penalties.

67. **Training.** The Contractor shall conduct hands-on training once the entire installation has been fully tested and commissioned. He shall provide entire training material for the NS Hospital staff which shall include the presentations to be used for trainings and also the required relevant documents for the topics being covered. Accordingly, the Contractor is also required to arrange respective subject matter experts from the respective OEM's on as required basis. NS Hospital shall identify upto 05 personnel in a maximum of two batches for this 7-day training at NS Hospital premise itself. The subjects shall cover entire operations of project components including DC operations, NOC administration, Do's and Don'ts, system features, operations & management, security administration and other aspects or as decided by NS Hospital administration, Consultant and IT Staff. The training shall be imparted on conceptual aspects of the IT & Non-IT components / equipment & would also cover the hands-on training.

68. **Master Backup**. Once the testing, documentations and staff training has been completed, the Contractor shall obtain a mirror backup of the entire systems, devices, components and equipment supplied as part of the project, so as to enable quick recovery in case of failure of devices. In addition to the mirror image files, this backup shall also provide as-built final settings, all configuration files, and essential documentations showing all devices and components of the entire project.

69. **Project Sign-Off or Acceptance**. Project Sign-off means that the Contactor has completed the commitments of project handing over, FAT, documentations, training, system backup and the project warrantee and the facilities management services have commenced and operating satisfactorily. Acceptance shall be further defined as beneficial use by the NS Hospital. Acceptance shall be deemed "in full" upon the issue of project sign-off certificate of completion by the NS Hospital upon beneficial use and full implementation of the Terms and Conditions, successful running for 72 hrs and Technical Specifications of the Contract. The customer shall consider the project has been completed successfully. The date appended on this certificate shall be deemed to be the date of successful commissioning of the Project and accordingly, this date shall be the benchmark for the calculation of warrantee, PBG and FMS services.

70. **Build, Prove, Demonstrate, Test, Train and Operate.** Since the project envisages state-of-art technologies, outside the domain expertise and core competence of the buyer, **the Contractor shall be responsible for the complete integration, proving, demonstration of the system capabilities, and operation of the entire functionalities / features along with its training**. This activity shall be conjoined with the project warranty period of one year from the date of commissioning and shall be hereinafter termed as '**Facility Management Services (FMS)'** in the rest of the document. The cost, if any, for undertaking the Facility Management Services as specified at these documentations shall be itemized / quoted alongwith the Commercial Bid, which shall be tabulated to arriving the L1 status.

71. **....3rd Party Testing**. In case of any doubt or lack of clarity, the Buyer reserves the right to undertake random tests of system, upto 25% of the total project quantity, at the cost of the Contractor, at any labs indicated by the Buyer or the Consultant – at the risks and expenses of the Contractor. Any deviations from agreed specifications shall be rejected outright without further explanations.

72. ....**Project Drawings & Documentations.** The Successful Contractor shall furnish a complete set of as-built premise drawings depicting the actual work details, alongwith the complete settings, room and rack wise markings, labelling, layout of each components, accessories, etc. The associated drawings shall also depict complete design layouts and as installed physical and logical architectures, etc. A total of three set such documents shall be made in soft and hard, ie, three sets of DVD/CD's and three portfolios (300 x 450 mm) each containing complete set of drawings, and details as mentioned above. The documentations shall be completed prior to system acceptance and shall be verified by the customer for his satisfaction. Other stage wise indicative lists of documents include:-

(a) On Project Commencement: Project timelines in MS Project giving out micro level activities with milestones & deadlines. (To be submitted prior the first coordination meeting or within two weeks of work order acceptance letter)
(b) Training: It is the responsibility of the Contractor to provide entire training material for the NS Hospital staff which shall include the presentations to be used for trainings and also the required relevant documents for the topics being covered.
(c) Process Documentation of DC: The Contractor shall be responsible for preparing process documentation related to the operation and maintenance of each and every component of the DC. This process document shall be formally signed off jointly by NS Hospital, Consultant and the Contractor prior project handing over.

(d) As Installed Drawings & Documentations: The Contractor shall prepare and submit three complete sets of as installed drawings which comprise Architectural, Structural, ELV, Security and ICT works pertaining to all the services incorporated into the works by him, his sub-contractors, nominated sub-contractors or otherwise. These Coordination drawings submitted by the Contractor must integrate with all the drawing for the whole works and must ensure efficient and orderly installation of all the parts of the works to ensure of non-interference with structural framing, cabling, interfaces, labelling scheme, IP addressing scheme, ceilings, partitions, equipment's, lights, mechanical and electrical and other services, with emphasis to safety, maintainability and serviceability for the lifetime of the project. All drawings shall be in AutoCAD or Visio format. The Contractor shall guarantee that the said Coordinated Drawings shall be free and independent of any fault and they are fit for the purpose

i. The Contractor shall document complete inventory list of systems installed and commissioning procedures, including its final drawings, blue-prints etc with markings and provide the same to the NS Hospital (in three hard copies and three soft copies) within one week of the commissioning of project.
ii. As built drawings (trunking/conduiting routes, location of network port, equipment racks, schematic diagram, IP Address Schema, arrangement of equipment in DC room and etc using standard symbols
iii. Setting parameters and configurations of each related equipment.
iv. Warranties, certificates and licenses (alongwith its renewal periods) in an exclusive folder
v. Documentations are also to include signal level measurements during project testing at all outlet locations.
vi. The Contractor shall submit a complete set of Floor Layout Drawings, various project components, Line diagrams, a complete cabling system layout (as installed), including cable routing, telecommunication closets and telecommunication outlet / connector designations. The layout shall detail locations of all components and indicate all wiring pathways.
vii. Manuals for configuring of switches, routers, security devices and other appliances etc shall also be provided by him.
viii. The Contractor shall also handover two copies of all system and device passwords (sealed cover), system configuration, routing and VLAN details, security settings etc
ix. All user manuals and operating instructions.

73. **....Warranty.** Materials and workmanship hereinafter specified and furnished shall be fully guaranteed by the Bidder for **One full year** from the date of handing over, against all/any defects. Defects which may occur as the result of faulty materials or workmanship within this period shall be corrected by the Bidder at no additional cost to the NS Hospital. The Bidder's warranties shall commence with acceptance of the work in full. Project being critical network, all reported defects are to be rectified on Next Business Day (NBD) basis. Please note that the **final payment shall not relieve the Contractor from these obligations.**

74. ....**Facility Management Support (FMS)**. During the warranty support period, the Contractor should provide two or more dedicated FM engineers dedicated on site at NSH for carrying out entire O & M activities. The broad SoW and our T & C shall be issued as corrigendum to this document. All bidders are requested to factor both project warranty on NBD basis and FMS as part of their costing in the pricing schedule provided.

75. ....**Force Majeure**. Following Force Majeure clauses shall be applicable:-

a) Neither party shall bear responsibility for the complete or partial Non-performance of any of its obligations (except for failure to pay any sum which has become due on account of receipt of goods under the provisions of the present contract), if the non-performance results from such Force Majeure circumstances as Flood, Fire, Earth Quake and other acts of God as well as War, Military operation, blockade, Acts or Actions of State Authorities or any other circumstances beyond the parties control that have arisen after the conclusion of the present contract. In such circumstances, the time stipulated for the performance of an obligation under the present contract is extended correspondingly for the period of action of these circumstances and their consequences.

b) Certificate of a Chamber of Commerce (Commerce and Industry) or other competent authority or organization of the respective country shall be a sufficient proof of commencement and cessation of the above circumstances.

c) The party for which it becomes impossible to meet obligations under this contract due to Force Majeure conditions, is to notify in written form the other party of the beginning and cessation of the above circumstances immediately, but in any case, not later than 10 (Ten) days from the moment of their beginning.

76. ....**Change Management.** The buyer, NS Hospital reserves the right to vary scope of contract at the time of award or during the course of work as under:-

a) The NS Hospital may at any time, by a written order given to the Contractor, could make changes to the project timelines, scope of the work or its overall design.

b) Changes, modifications, waivers, additions or amendments to the items, project scope, terms and conditions of this Purchase Order shall be binding on both of us only if such changes, modifications, waivers, additions, or amendments are in writing and signed by a duly authorized representative of NS Hospital.

c) Notwithstanding the scope of supply/work specified hereafter, NS Hospital shall have the right to modify its scope during the execution of the Contract. The necessity for repairs / renewals / replacements other than those presently included in the Scope of Work may arise during the inspection / survey / repair. All such work as also consequential work (rework) required to be done by the Contractor along with work arising out of items/drawings supplied by us shall be treated as Scope of Work.

d) Changes in the scope of work and the cost and time implications thereof shall be mutually agreed upon on priority, in writing, before undertaking such changes in the scope of work. The resultant increase or variations in cost as well as any extension in project duration shall be agreed and accepted by NS Hospital through mutual negotiations prior to undertaking such changes.

e) If any such change causes an increase or decrease in the cost of or the time required for the Bidder's performance of any part of the work under the Contract, whether changed or not changed by the order, an equitable adjustment shall be made in the Contract Value or time schedule, or both, and the Contract shall accordingly be amended. Any claims by the Contractor for adjustment under this Clause must be asserted within thirty (30) days from the date of the Contractor's receipt of the NS Hospital changed order.

f)… In accordance with the tolerance clause mentioned above, the final negotiated rates provided by the Contractor as part of his commercial quote shall be considered as benchmark rates for placing change / additional orders, if any.

77. ....**Extension of Time for Completion.** In the event of

a) The amount or nature of extra or additional work, or
b) Any cause of delay beyond the scope and reasons of the contractor, or
c) Exceptionally adverse climatic conditions, or
d) Any delay, impediment or prevention by the Buyer, or
e) Other special circumstances which may occur, other than through a default of or breach of Contract by the Contractor or for which he is responsible,

.....being such as fairly to entitle the Contractor to extension of time for completion of the works or any section or part thereof, the Project Consultant shall after due approval of the Buyer, determine the period of such extension and shall notify the Contractor in writing accordingly, with a copy to Buyer. Provided further that the Project Consultant is not bound to make any determination unless the Contractor has

a) within 7 days after such event has arisen notified the Project Consultant or the Buyer rep, and

b) within 7 days, or such other reasonable time as may be agreed by the Project Consultant, after such notification submitted to the Project Consultant detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.

.....The contractor may be given provisional time of extension till the time extension case is finally approved.

78. ....**Termination Clause.** We, the Buyer may terminate the Contract if the Contractor causes a fundamental breach of the Contract. These fundamental breaches of Contract shall include, but shall not be limited to, the following:

a) The Contractor stops work for 14 days when no stoppage of work is shown on the current programme and the stoppage has not been authorized by us,
b) The Contractor is declared as bankrupt or goes into liquidation other than for approved reconstruction or amalgamation. Termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Employer.
c) The Consultant or the NHS Hospital Management gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct within a reasonable period of time determined by us;
d) The Contractor does not maintain the personnel safety and the site security standards, which is required;
e) The Contractor has delayed the completion of the works by the number of days for which the maximum amount of liquidated damages (LD) can be paid, as defined in relevant clause.
f) The Contractor fails to provide insurance cover as required under relevant clause.
g) If the Contractor, in the judgment of the Employer, has engaged in the corrupt or fraudulent practice in competing for or in executing the Contract. For the purpose of this clause, "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract execution. "Fraudulent Practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Buyer and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid process at artificial non-competitive levels and to deprive the Buyer of the benefits of free and open competition.
h) If the Contractor has not completed at least thirty percent of the value of the work required to be completed after half of the completion period has elapsed;

i) If the Contractor fails to deploy machinery, systems, devices and equipment or personnel as specified in the Contract at the appropriate time.
j) If the contractor fails to perform diligently and undertake the work with no good quality and time as stipulated by us.
k) Failure of the successful bidder to comply with the requirement of submission of Bank Guarantees and security shall constitute sufficient ground for cancellation of the award of work and forfeiture of the bid security.

.....Notwithstanding the above, the Buyer may terminate the Contract for convenience. If the Contract is terminated, the Contractor shall stop work immediately, make our site safe and secure, and leave our premises as soon as reasonably possible.

79. ....**Arbitration**. In the event of any dispute or difference arising between the Contractor and tenderer out of or about the Contract or Tender or documentations or any of the terms and conditions contained therein or as to the interpretation or any other matter, both the parties shall resolve such dispute or difference first by mutual discussions. If any dispute or difference persists, it shall be referred to The President, NS Hospital for arbitration and reconciliation, who will have the freedom to appoint the Arbitrator. The arbitration will be held in Ernakulam and the proceedings shall be conducted in English. The parties to the dispute will instruct the Arbitrator(s) to render a decision within 30 days of the date of their appointment and such a decision shall be binding on both the parties. This Tender and the Contract shall, in all respects, be governed by and construed in all respects in accordance with the laws of the Republic of India.

PART-II

OPERATION & MAINTENANCE (O & M) OF TOTAL ELV PROJECT – NS HOSPITAL, QUILON

1. **Scope of O & M Services & Works**. The Contractor shall provide facility operating, monitoring and management all services listed in this document on 24x7 basis, during the contractual period from the date of project handing over, as per the rates quoted and broad conditions enumerated in this document. The Contractor shall implement a centralized Operations Control Room (OCR) along with necessary hardware and software arrangements at the first floor of the ECF building. The OCR shall be the nerve centre of all the operational and management functions aimed by this project. While manning the contractor shall act on 1st level help/assistance requirements, while the filtered escalations will be referred to CSO for its resolution. The scope of this OCR shall be to render advice to the dispersed ECF manpower, lane guards, and resolve and proactively respond not only to all CCTV incidents and events, but also for the overall management and maintenance of all project related technical support tokens and its timely resolution. OCR is also required to escalate outstanding issues if any to the next responsible authorities based on the NSH priorities and urgencies. It is Contractor's responsibility to ensure resolution within the timelines specified in the agreement. The Contractor shall further responsible for the general upkeep, cleanliness, of rooms, facilities, devices and systems under his purview and operations.

The period of O & M starts with the project commissioning at the first year of operation. However, the essential difference between the first year and the subsequent years is that, the first year O & M includes full replacement of all those defective components and project devices, whereas, in subsequent years – the defect rectification by repairs is acceptable.

a) During the currency of the Contract, the Contractor shall be responsible for the smooth working of the total project installed as per the facility management SLAs mentioned in this document. The broad duties and responsibilities of the O & M Contractor shall include, but not limited to:-

(i). Round the clock (24x7) operations, monitoring & performance management of entire ECF, Toll Collection, Visitor control and management etc alongwith the serviceability/maintenance of associated / allied infrastructure

(ii). Complete system operations, site management and running of help desk services, on behalf of NSH.

(iii). Overall security and SLA management

(iv). IT and Network system management, server operations, database entry, allied administration & management Services

(v). As part of O & M, the Contractor shall carry out the process for enrolment, personalization and card printing for all personnel during installation and post acceptance. Registration of NSH staff, enrolment of visitor, RFID tagging of vehicles, printing and encoding of passes alongwith its issue and accounting.

(vi). Network configuration, VLAN & Network fault management

(vii). System maintenance, loading of software updates, patches, renewal of applicable licenses etc.

(viii). All project related defect rectifications, including first level maintenance and operation of components that are part of the project supply as per the agreed downtime terms and conditions.

(ix). Licence renewals and version upgrades both at server and end points

(x). Helpdesk, Complaints logging and Call centre arrangements for the IT, Security and Networking components.

(xi). Remote monitoring and management of all IT, ELV and non-IT devices that shall be installed on a 24x7x365 basis.

(xii). Proactive monitoring, maintenance, repair and replacement of defective project components, as per the agreed SLAs. The cost for repair and replacement shall be borne by the O & M Contractor.

(xiii). The selected bidder shall maintain essential stock and provide adequate onsite and offsite spare parts and spare component to ensure that the uptime commitment as per SLA is met. To provide this service, it is important for the Contractor to have back to back arrangement with the OEMs. The selected bidder needs to provide a copy of the Service Level Agreement signed with the respective OEMs, prior project sign-off.

(xiv). Component that is reported to be down on a given date shall be either fully repaired or replaced by temporary substitute (of equivalent configuration) within the time frame indicated in the Service Level Agreement (SLA).

(xv). The selected bidder shall also maintain records of all maintenance of the system and shall maintain an online log that can be regularly inspected and approved by CSO at any time.

(xvi). During the Defects Liability Period, the Contractor is required to carry out operation and maintenance service to the entire project work and systems. Systematic and periodic inspection, adjustment, and fine tuning, etc. shall be carried out monthly or at shorter intervals or as and when required and the bidder shall replace or otherwise make good at his own expense, part and/or parts which become faulty or defective using genuine standard parts produced by the manufacturer of the equipment concerned.

(xvii). The Contractor shall replace or otherwise make good at his own expense, part and/or parts which become faulty or defective using genuine standard parts produced by the manufacturer of the equipment concerned O & M period.

(xviii). O & M shall include all transportation, equipment, labour, material and parts to perform the periodic maintenance required under the project.

(xix). Crimping, patching and splicing of all passive cables.

(xx). Re-installation in the event of system crash/failures.

(xxi). Maintenance of a log of the performance monitoring of servers including but not limited to monitoring CPU, disk space, memory utilization, I/O utilization, and associated VM performances etc.

(xxii). Event log analysis generated in all the sub systems including but not limited to servers, operating systems, databases, application software, device ROMs, embedded PLC, etc. Ensuring that the logs are backed up and truncated at regular intervals.

(xxiii). Periodic health check of the systems, troubleshooting problems, analysing and implementing rectification measures.

(xxiv). Implementation and maintenance of standard operating procedures for maintenance of the infrastructure based on the NSH policies.

(xxv). Management of the user names, roles and passwords of all the relevant subsystems, including, but not limited to servers, applications, devices, system etc.

(xxvi). all IT hardware problems, network failures, including cable faults and snags like rat bites etc

(xxvii). End-to-end management of database on an ongoing basis to ensure smooth functioning of the same.

(xxviii). Management of changes to database schema, disk space, storage, user roles.

(xxix). Management of encryption and access rights and verification of logs.

(xxx). Conduct code and configuration reviews to provide tuning inputs to the NSH / Customs / User Department in order to improve the application performance or resolve bottlenecks if any.

(xxxi). Performance monitoring and tuning of the databases on a regular basis including,

preventive maintenance of the database as required.
(xxxii). Management of database upgrade or patch upgrade as and when required with minimal downtime.
(xxxiii). Regular backups for all databases in accordance with the backup and archive policies and conduct recovery whenever required with appropriate permissions.

2. **Conditions of Facility Management Services**. The general conditions of Facility Management Services would be are follows:-

a) Contractor shall depute the requisite number of engineers, operators and technician to operate, configure, maintain and manage the entire infrastructure on 24x7 basis during the period.
b) The Contractor may however, offload this responsibility to the respective OEMs, in case it is outside his business domain or finds difficult to complete the work on time. In such case, additional financial implications if any shall have to be borne by the Contractor himself.
c) The accommodation and the allied logistics are the responsibility of our O&M contractor.
d) The renewal of Facility Management Services for the second and subsequent years is at the discretion of the NSH and decision shall be taken by the user.
e) Full sub-contracting or sub-letting a portion/part of Facility Management Services is permitted, provided mutually agreed between the Contractor and the NSH. However, the Contractor shall only be directly responsible to NSH for the acts of this sub-Contractor.
f) All personnel employed for managing these functions and services shall have to strictly adhere and comply to the rules, regulations of the NSH.
g) The O & M also include repair, replacement of all defective parts, modules, sub-assemblies of the entire system (Other than consumables), it shall be the main responsibility of the Contractor to keep the NSH system in full working condition at all times.
h) All defects related to virus or intrusions, of attacks or OS malfunctions are also within the scope of work.
i) The Contractor is responsible for undertaking these works and also provides Facility Management without any additional cost to the NSH.
j) All payments associated with O & M shall be made only on quarterly basis, on issue of User Certificate.

4. .....**MIS Reports.** The Contractor shall generate various reports related to the system operations, system efficiency, toll collections, personal efficiencies etc, over automated service level agreement (SLA) management tools. The Contractor shall submit the reports on a regular basis in a mutually decided format. The following is only an indicative list of these periodical MIS reports that may be submitted to various NSH authorities. NSH is free to add/delete/modify the reports on as required basis:-

(a) Daily Reports
(i). Daily Toll statement
(ii). Daily Toll Collection (Vehicle wise, lane wise, and class wise)
(iii). Summary of issues / complaints logged
(iv). Summary of resolved, unresolved and escalated issues / complaints
(v). Major hardware malfunctions or breakdown, if any
(vi). Connectivity related issues, if any
(vii). Other reports as requested by the NSH periodically
(viii). Daily Traffic Census
(ix). Daily visitor pass report
(x). Exempt reports from ECF lanes
(xi). Details of major events and incidents

(xii). Loss report for personal ID cards
(xiii). Loss report of vehicle RFID tags

(b) Weekly Reports
(i). Weekly Toll report
(ii). Weekly Traffic Census
(iii). Weekly system configuration reports
(iv). Discrepancy report
(v). Operator efficiency report
(vi). Details of unresolved issues / Complaints
(vii). Analysis report for various NSH functions
(viii). List of outstanding system defects
(ix). Summary of unauthorized entry attempts and failed logins alongwith their details
(x). Summary of issues / complaints logged with the OEMs.
(xi). Inventory of spare parts available at site.
(xii). Summary of changes undertaken on the system, including major changes like configuration changes, patch upgrades, database reorganization, storage reorganization, etc. and minor changes like log truncation, volume expansion, user creation, user password reset, etc.
(xiii). Other reports as requested by the Buyer periodically

(c) Monthly Reports
(i). Consolidated SLA / (non)-conformance report.
(ii). Summary of component wise uptime/downtime.
(iii). Log of preventive / scheduled maintenance undertaken
(iv). Log of break-fix maintenance undertaken
(v). Summary of security violations reported and observed
(vi). Status of storage space in servers
(vii). Major incident reports
(viii). Other reports as requested by the Buyer periodically

(d) Quarterly Reports
(i). Consolidated component-wise physical and IT infrastructure availability and resource utilization.
(ii). Details of licenses and subscriptions to be renewed or updated
(iii). Consolidated quarterly SLA performance report of 3rd party applications and hardware infra across vendors for review/consideration by NSH.
(iv). Other reports as requested by the Buyer periodically

(e) Half-yearly Reports
(i). Overall system Audit Report
(ii). Report on Loss/Profit statement of O & M
(iii). Infrastructure Upgrade / Obsolescence Report
(iv). Details of hardware to be upgraded or changed
(v). Details of software that needs version upgrades alongwith its implications
(vi). Other reports as requested by the Buyer periodically

Service Level Agreement (SLA)

6. .....The purpose of this Service Level Agreement (hereinafter referred to as SLA) is to clearly define the levels of service which shall be provided by the Contractor to NSH for the duration of this contract. The

Contractor and NSH shall regularly review the performance of the services being provided by the Contractor and the effectiveness of this SLA. In case of intermittent failures and repetitive problems due to improper diagnosis or repair, the system will be treated as continuously down and penalty will be imposed as per SLA terms and conditions

7. .....**Definitions.** For purposes of this Service Level Agreement, the definitions and terms as specified in the contract along with the following terms shall have the meanings set forth below:-

(a) "**Uptime**" shall mean the time period for which the specified services / components with specified technical and service standards are available to NSH and to its various user departments and sections. Uptime, in percentage, of any component (Non IT & IT) can be calculated as:

Uptime = {1- [(Downtime) / (Total Time – Maintenance Time)]} x 100

(b) "**Downtime**" shall mean the time period for which the specified services / components with specified technical and service standards are not available to NSH and to its various user departments and sections and however excludes, the scheduled outages, if any planned in advance by NSH and the link failures that are BSNL / respective service provider responsibility.

(c) "**Incident**" refers to any event / abnormalities in the functioning of a project equipment / specified services or any other project component that may or may not lead to disruption in normal operations of the University.

(d) "**Helpdesk Support**" shall mean the centre /person who handle support services such as, Fault reporting, Trouble Ticketing and related enquiries during this contract.

(e) **Service Response Time**. Amount of time from the initial notification to the Contractor until a technician physically arrives at the location or remotely attends to the issue.

(f) **Service Restoration Time**. Amount of time from the initial notification to the Contractor until the time the system is operational again.

(g) **Permanent Repair Time**. Amount of time from initial notification to the Contractor until the time permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration requirement.

(h) **Recurring Defects.** Defects that are occurring 2nd time with the same nature and system shall be termed as "Recurring Defect". Further, in the event that a defective item of part or a module or PC board has been replaced and the replacement becomes defective or malfunctions any time afterwards, the Contractor shall make a thorough investigation into the cause of the defect or malfunction and report his finding to the KITCO Engineer at site, together with his recommendations for permanently rectifying the defect or malfunction and ensuring it will not re-occur in the item of plant and any other items of plant that are of a similar material or installation.

(i) "**Resolution Time**" shall mean the time taken (after the incident has been reported at the helpdesk), in resolving (diagnosing, troubleshooting and fixing) or escalating (to the second level or to respective Vendors, getting the confirmatory details about the same from the Vendor and conveying the same to the end user), the services related troubles during the first level escalation. The resolution time shall vary based on the severity of the incident reported at the help desk. The severity would be as follows:-

(i). Critical: Incidents whose resolution shall require additional investment in components or time or shall involve coordination with OEMs. These incidents shall impact the overall functioning of the project. For example, breakdown of a controller or a boom barrier, software bug fixing etc.

(ii). Medium: Incidents, whose resolution shall require replacement of hardware or software parts, requiring significant interruption in working of that individual component. For example, installation of operating system, replacement of switch etc.

(iii). Low: Incidents whose resolution shall require changes in configuration of hardware or

software, which shall not significantly interrupt working of that component. For example, installation of printer on a client, replacement of patch chord etc.

10. ....Equipment Availability Related penalties shall be governed by the following conditions:-

a) The Penalty shall be calculated on a quarterly basis.
b) If the SLAs drop below the lower limited specified for each component in the table above, it shall be governed by the event of default clause as specified under the General Conditions of the Contract.

11. ....**Help Desk & Complaints related SLA.** Time in which a complaint / query is resolved after it has been responded to by the service management.

Type of Incident	Resolution Time	Penalty
Critical For critical the resolution time shall be mutually agreed by NSH and the Contractor at the time of award of contract. "T" shall be the agreed resolution time.	**T**	No Penalty
	T1 = T+2 hours	1% of the Quarterly Payment for every unresolved call
	T2 = T1+2 hours	2% of the Quarterly Payment for every unresolved call
	> T2	4% of the Quarterly Payment for every unresolved call
Medium	1 day from the time of incident logged at the help desk	No penalty
	> 1 day and < =2 days	1% of the Quarterly Payment for every unresolved call
	> 2 days	2% of the Quarterly Payment for every unresolved call
Low	<= 2 days from time of response logged.	No Penalty
	> 2 days and < = 4 days	1% of the Quarterly Payment for every unresolved call
	> 4 days	2% of the Quarterly Payment for every unresolved call

12. **....Incident/Event/Complaint Resolutions.** The Contractor shall be fully responsible for maintenance of all system components, devices, including all other allied hardware and software applications under this project. Maintenance shall include, but not be limited to, any equipment failures or malfunctions as well as equipment damage either by the motoring public, Contractor operations, or other means. The potential cost of replacing or repairing any malfunctioning or damaged equipment shall be included in the bid price of this item and will not be paid for separately. The Contractor shall promptly clear the defective parts, unit, items and circuit discontinuity and restore the system to service as per the documented SLA timelines. The following chart lists the maximum response, service restoration, and permanent repair time the Contractor shall be allowed to perform corrective action on specific system equipment.

Incident or Problem	Service Response Time	Restoration Time	Permanent Repairs Time
Control cabinet out	1 hour	4 hours	7 Calendar days
CCTV Camera defects	1 hour to clear	2 hours	5 Calendar days
Miscellaneous physical damages	8 hour to clear	2 hours	7 Calendar days
All types of electrical defects	1 hour	4 hours	2 Calendar days
Circuit out - Cable cut	1 hour	24 hours	2 Calendar days
Outage of 3 or more successive or recurring defects	1 hour	8 hours	5 Calendar days
Manpower shortages	15 Minutes	1 hour	2 Calendar days

13. **....Incidental Damages**

(a) **Non-Compliance**. The Contractor will be subject to liquidated damages of Rs1,000.00 per incident, per day, to be deducted from next payment due Contractor, for each occurrence when NSH determines that Contractor or his Subcontractor is not in full compliance with this Article.

(b) **Failure to Respond**. The Contractor is required to respond in accordance with the above response requirements. Failure by Contractor to so respond shall be grounds for liquidated damages of Rs1,000.00 for each and every occurrence, to be deducted from next payment due Contractor. In addition, the NSH /Kitco reserve the right to assign any work not completed within this timeframe to any other maintenance agencies. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. These costs will be deducted from next payment due Contractor.

(c) **Repeated Occurrences**. Repeated failures and/or a gross failure of maintenance shall result in calling for another professional and capable organisation to correct all deficiencies and the resulting costs will be deducted from any amount owed the Contractor. Any allied damages caused by the Contractor's operations or his negligence shall be also repaired at no additional cost to the contract

14. ....**Compliance & Reporting Procedures SLAs**

#	Measurement	Definition	Target	Penalty
A	Submission of MIS Reports	Contractor shall submit the MIS reports as requested by NSH at this document	Daily reports have to generate by four (1600H) "O" clock, every evening.	0.25% of the Quarterly Payment for every 1 hour of delay in submission on an incremental basis to a maximum of 0.5%.
B			The weekly reports shall be generated by every Monday afternoons.	0.5% of the Quarterly Payment for every 1 day of delay in submission on an

				incremental basis to a maximum of 1%.
C			Report for the previous month shall be submitted by the 7th of the next month.	1 % of the Quarterly Payment for every 1 day of delay in submission on an incremental basis to a maximum of 5 %.
D			Quarterly report are to be submitted along with the Monthly reports	1 % of the Quarterly Payment for every 1 day of delay in submission on an incremental basis to a maximum of 5 %.
E			Half-yearly report are to be submitted along with the Monthly reports	1 % of the Quarterly Payment for every 1 day of delay in submission on an incremental basis to a maximum of 5 %.

15. ....**Deduction of Penalties**

a) The total deduction shall not exceed 25% of the Quarterly Payment.
b) Two consecutive quarterly deductions of 25% or more of the applicable fee on account of any reasons shall be deemed to be an event of default and termination.
c) The certifications would be obtained by the Contractor latest by end of third Quarter of the Operations phase failing which the subsequent Quarterly Payments shall deferred till the certifications is obtained.

16. ....**SLA Review Process**

a) Either NSH or Contractor may raise an issue by documenting the business or technical problem, which presents a reasonably objective summary of both points of view and identifies specific points of disagreement with possible solutions.
b) A meeting shall be conducted at NSH conference hall to resolve the issue in a timely manner. The documented issues shall be distributed to the concerned parties at least 24 hours prior to the discussion if the issue is not an emergency requiring immediate attention.
c) The NSH and the Contractor shall develop an interim solution, if required, and subsequently the permanent solution for the problem at hand. The Contractor shall then communicate the resolution to all interested parties.
d) NSH shall call for periodical performance review meeting with the Contractor at appropriate level as demanded by the situations and, on as required basis.

SECTION-II (Pre-Qualification (PQ) of Bidders) - Part of Cover-1

For ELV Infrastructure Integrators (as Bidders) for Actives

Client: NS Hospital, Quilon

#	Bidder Criteria	Proofs & Documentary Submittals	Rating / Merit Criteria		
			Evaluation Criteria's	Internal	Marks
1	**Bidder Name & Particulars**				
A	Postal Address & details of the registered Head Office	Relevant Documents or Undertaking signed by the Authorized Signatory.	Satisfactory Documentary Proofs		
B	Name and address of the Person Signing the document	Power of Attorney attested by Notary or Copy of the board Resolution certified by the Company secretary for appointing the Power of Attorney, or in case of proprietorship, credential and clear identity of the person signing the document			
C	The bidder shall have an office in South India and must have the provisions and approvals for local billing.	Relevant Documents or Undertaking signed by the Authorized Signatory. Registration Details of the HO and branches, particularly in Kerala to be provided	Satisfactory Documentary Proofs		
D	Land Phone (with STD Code)		Satisfactory Documentary Proofs		
E	Fax (with STD Code)				
F	Official Email IDs				
G	Cell Phone of Authorised Signatory				
H	Cell Phone of Single-Point of Contact				
J	Website Links				
K	Other details of Branch and Support Offices	Submit Office & GST registrations as proof	Proof of valid Registrations		
2	**Nature of Bidder**				
A	Private Limited/Public Limited/ Cooperative Society/PSU/Proprietorship	In case of Company or Society a) Certificate of Incorporation c) Memorandum and Article of Association d) Details of Directors In case of Proprietorship or others a) Details on primary area of business b) Details of Proprietorship/others with proof of registration or applicable documents.	All above subject to the proof of valid Registration		
3	**Bidder Credibility & Credentials**				
A	**Years in Business**. Registration Details with Year of Formation. (The bidder shall be in existence for minimum of 10 years)	Relevant proof of registration; Certificate from auditors or from banks.	Subject to validity of proofs and number of		

#	Bidder Criteria	Proofs & Documentary Submittals	Rating / Merit Criteria		
			Evaluation Criteria's	Internal	Marks
1	**Bidder Name & Particulars**				
	(The bidder shall be in existence for minimum of 10 years)		years		
B	Whether the bidder or the entity is a direct owner or a consortium under direct teaming agreement or a tie up and technical arrangement on case-to-case basis.	Copies of PO copies of projects undertaken successfully as same consortium partners.	Lone direct Bidder Consortium/JV Subcontracts		
C	Only for Consortium or JV bidders. (All the indicated pre-qualification criteria are to be met by the Lead bidder himself)	Copy of SLA and MoU of the teaming agreement along with the details and number of projects jointly undertaken as consortium. Roles & Responsibilities of each partner must be mentioned clearly along with the project and the work split-up.	Should not be an opportunist alliance		
D	Details of credible Certifications & Industry Recognitions, received in last three years	Self-certified copies of such certificates are to be attached.	ISO, National or International awards etc		
4	**Staff Strength (Only on own Pay roll)**				
A	Admin + Finance + Back Office	Provide department-wise complete organizational structure, with their academic qualifications, additional skill-sets, staff payroll of last month etc.	Based on Staff Strength in own payroll		
B	Sales + Presales + Marketing				
C	R & D				
D	Project Staff				
E	FMS (Both onsite and offsite)				
F	Details of other skilled staff				
G	Total Staff strength	The staff indicated is cumulative total of every staff breakdown submitted			
5	**Legal**				
A	Has your firm ever failed to complete any contract or works?	Details and Declaration in this regard by the authorized signatory of the prime bidder shall be attached. Self Certification with details for each of the heads is essential.	Subjected to verification		
B	Are you involved in any mergers, business acquisition , or buy-outs?				
C	Are there any judgements, claims, arbitration proceedings or suits pending or outstanding against the company, associate firms or its Officers?				
D	Are you now, or have you ever been involved in any bankruptcy or reorganization proceedings?				
E	Is your firm blacklisted by any Govt or PSUs in last five years?				
6	**Compliance to Government Norms**				
A	GST registration	Copy of GST Registration	Verify each of these registration proofs		
B	Details of TIN	Copy of TIN			
C	Income Tax Registration	Details of PAN			

#	Bidder Criteria	Proofs & Documentary Submittals	Rating / Merit Criteria		
			Evaluation Criteria's	Internal	Marks
1	**Bidder Name & Particulars**				
D	HSN Code	Details of HSN Code	Registration proofs		
E	Details of EPF/PF	Certificate from bidder for number of staff enlisted in EPF/ PF with their Names and benefit subscription details.			
F	Details of ESI/Health Insurance				
7	**Financials.**				
A	The prime bidder shall have a minimum turnover of over hundred (2) crores INR in last financial year	Submit audit proofs showing minimum turnover. Bidders with at least net worth equivalent to 20 times of the estimated cost of works during present financial work, shall be preferred	More the turnover, more points		
B	Bidder should have Positive Net worth during last 3 years, ending 31.03.2018	Submit letter from banker/CA	Bankers Certificate please		
C	Bidder should have sanctioned BG limit equivalent to 20% of the estimated works in present calendar year.	Provide a certificate from Bank mentioning the same	Bankers Certificate please		
D	Bidder should have sanctioned Cash Credit (CC) limit equivalent to 5% of the estimated works in present calendar year.	Provide a certificate from Bank mentioning the cash credit limit in present calendar year	Bankers Certificate please		
E	Give Year-wise Turnover (Rs. Lakhs)	Submit letter from banker/CA or audited Balance sheets	Check for the business stability of the bidder		
I	2018-17				
II	2017-16				
III	2016-15				
IV	2015-14				
V	2014-13				
F	The bidder shall be profitable at least for the past 3 years. Net Profit (Rs. Lakhs)	The Bidder should be a profit-making organization for the last three years. Attach certified Profit & Loss Statements.	Nil reports or Audit results showing loss means, negative points		
I	2018-17				
II	2017-16				
III	2016-15				
8	**Reference Projects - Health Domain**				
A	Should have executed One similar projects worth more than 1 crores in hospitals in last 3 years…. Or,	Submit PO or WO copies proving that the Bidder has adequate experience in various ELV Technologies (indicated under serial 8D) and shall include specific experience in implementation, Integration, Operations and Maintenance of technology Infrastructure projects in Health Care Domain. Commendation from the existing clients, Submit proof of PO/WOs. Or; Self-certified recent Work Orders Copies / Customer testimonial letters (project of	Check for work experience in the relevant ELV domain		
B	Should have executed Two similar projects worth more than 01 crores in hospitals in last 3 years….. Or,				
C	Should have executed Three similar projects worth more than 01 crores in hospitals in last 3 years				
D	Types of ELV Works expected:-				

#	Bidder Criteria	Proofs & Documentary Submittals	Rating / Merit Criteria		
			Evaluation Criteria's	Internal	Marks
1	**Bidder Name & Particulars**				
i	ICT, Network Infrastructure, Communications, Wi-Fi	same magnitude or bigger) confirming year and area of activity.			
ii	ITES/ Datacentre Build, Server Virtualisation				
iii	Electronic Security, ACS, Video Surveillance				
iv	Audio-Video, Signage, Background Music, PA				
v	IPTV/MATV, TV Distribution				
vi	Automation / Nurse Call Solutions				
9	**FMS & AMC Support**				
A	The bidder should have authorized service and support Kollam or Thiruvananthapuram district.	Provide address and contact details. Support centre at Quilon or Trivandrum carries additional weightage.	GST registration is required to prove the credentials.		
B	Details of project experience in Cooperatives / Govts / PSUs / Other	Submit proof of PO/WOs (Any other valid proofs)			
I	**Name**				
	Location				
	Contract sum (Rs.in lakhs)				
	Contract period				
	Year of Completion				
	Reference				
II	**Name**				
	Location				
	Contract sum (Rs.in lakhs)				
	Contract period				
	Year of Completion				
	Reference				
III	**Name**				
	Location	Self-certification with three (last three years) recent Work Orders Copies / Customer testimonial letters (project of same magnitude or bigger) confirming year and area of activity. Please note that order copies of lesser values shall not be factored and may be disregarded	Check for Onsite and Off-site, 24x-7 or 8x5, etc		
	Contract sum (Rs.in lakhs)				
	Contract period				
	Year of Completion				
	Reference				
IV	**Name**				
	Location				
	Contract sum (Rs.in lakhs)				
	Contract period				
	Year of Completion				
	Reference				

#	Bidder Criteria	Proofs & Documentary Submittals	Rating / Merit Criteria		
			Evaluation Criteria's	Internal	Marks
1	**Bidder Name & Particulars**				
V	**Name**				
	Location				
	Contract sum (Rs.in lakhs)				
	Contract period				
	Year of Completion				
	Reference				
10	**OEM Partnerships**				
A	The Bidder shall have professional tie-up and be a OEM partner for project components like Networking, Telephony, Wireless, AV etc.	Respective OEM documents to be submitted	Higher points for Gold and Platinum partners		
B	List of OEM trained skilled staff	Details along with their OEM competency certificates to be submitted. Other details, if any also to be submitted.			
11	**Bid Responsiveness**		Satisfactory Documentations with tagged submittals		
12	**Maximum Points that can be Scored**				**120**
		For Internal Use Only			
13	**Bidder Ranking**				
14	**Pass/Fail Percentage (Pass over 70%)**				
15	**Our Remarks & Recommendations**				

	B	C	D	E	F	G	H
1	**Section-III - Technical Specifications - Phase-II, Active Components - NS Hospital, Quilon, Kerala (Part of Cover-II)**						
2	**#**	**Parameters**	**Specific Technical Needs or Project Requirements**	**Full Compliance (Yes/No)**	**Enclosed References**	**Partial Compliances**	**Product Web Links**
3		**Bidder Responsiveness;** Each Bidder is to highlight their Compliance or Deviation and Value-additions, with adequate descriptions as applicable, and substantiate with technical details, but not limited to, the tagged (**indicate the page and paragraph numbers alongwith cross references with highlighting and page tagging**) original manufacturers' references and/or catalogues to our technical specifications. Responsiveness also include aspects like completeness of documentations, whether they have been properly signed, whether the bids are in order and all documents as per tender document have been submitted. Please be noted that, lack of clarity in documentations may earn Zero point for that row and/or Negative points for inadequacy of each documentation. Advertisement brochures are not accepted as reference documents.			Details of Attached Documents / Cross-References etc in support of Compliance or Deviation	List the details & reasons for Partial Compliances, if any	Links to the Product Websites or Justification
4	**A**	**Technical Specifications for Secure Gateway Router**					
5	1	**Basic Hardware Requirements**	Modular device with at least 2 expansion slots and shall have minimum 8 x 10/100/1000BaseT ports, 4 x 1G SFP ports and 4 x 10G SFP+ ports				
6	2		Device shall have at least one system management port, One x RJ-45 Console port and 1 x USB port				
7	3		Device shall have dual internal redundant power supply				
8	4	**Performance Requirements**	The Device should support Active and Dynamic L3 Routing / Firewall multiprotocol's and forwarding throughput of minimum 5Gbps, VPN throughput of 1Gbps with support for over 2000 VPN tunnels				
9	5		Shall have Route table size of minimum 1M IPv4 / IPv6 Routes and support up to 2M concurrent IPv4/IPv6 sessions				
10	6		Device should have all licenses required for Next Generation Firewall, VPN, Switching & Routing functionality on day one				
11	7	**Quality of Service (QoS) requirements**	Devices should support Class-based queuing with prioritization				
12	8		It should be possible to configure maximum bandwidth and guaranteed bandwidth				
13	9		Devices should support Queuing based on VLAN, Data link connection identifier (DLCI), interface, bundles, or filters				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
14	10		Devices should support Marking, policing, and shaping				
15	11		Devices should support congestion management features like WRED				
16	12	Routing Protocol Support	The Device should support IPv4 and IPv6 routing from day 1				
17	13		Should support over 1.48Mpps of routing throughput to provide wirespeed routing for 1Gbps traffic at 64byte packet size				
18	14		Devices should support RIP v1/v2, OSPFv2/v3, BGP (with Route Reflector) and IS-IS				
19	15		Should support MPLS (RSVP & LDP), MPLS traffic engineering and MPLS fast reroute				
20	16		The Device should support Policy Based Routing, Source Based Routing and ECMP				
21	17		Device should support Virtual private LAN service (VPLS) and next-generation multicast VPN (NG-MVPN)				
22	18		Device should support virtualization with virtual routers				
23	19	HA Capabilities	Device should support VRRP				
24	20		Should support stateful high availability with active/active dual device clustering				
25	21		Should support firewall session synchronization				
26	22		Should support route and interface failover monitoring				
27	23		Should support 802.1Q VLAN with support for minimum 2000 VLAN and 64K MAC Address				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
28	24	L2 / L3 Feature Support	Should support Link Aggregation 802.3ad / LACP				
29	25		Should support Jumbo Frames				
30	26		Should support Spanning Tree Protocol (STP) 802.1D, RSTP 802.1w, MSTP 802.1s on all Ethernet ports				
31	27		Should support 802.1x Port based and multiple supplicant authentication on all Ethernet ports				
32	28		Should support external or internal DHCP server services				
33	29		All Ethernet ports on the appliance should support full enterprise services including OSPF, BGP, PIM and IPv6 routing such as OSPFv3.				
34	30	Multicast Features	IPv4 Multicast features including IGMP v1/v2/v3 and PIM-SM, PIM-SSM and PIM-DM				
35	31		Should support Session Description Protocol (SDP), Distance Vector Multicast Routing Protocol (DVMRP) & Multicast Source Discovery Protocol (MSDP),				
36	32	Security Features.	Stateful Firewalling with support for minimum 500 zones				
37	33		Network attack detection and support DDoS attack prevention				
38	34		Protection from protocol and traffic anomaly				
39	35		Application Firewall with Application Visibility and Control				
40	36		Group VPN solution based on RFC 3547 - Group Domain of Interpretation (GDOI)				
41	37		Group VPN server and provide support for maintaining security policies, authenticating the Group Members and providing the session key for encrypting traffic. This function may be offered as integrated with VPN Concentrator or as a dedicated separate appliance				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
42	38	Should have necessary licenses and subscriptions for:-	SYN cookie protection and Zone-based IP Spoofing				
43	39		Network address translation (NAT) with support for Source NAT with PAT and Destination NAT with PAT, Persistent NAT and IPv6 Address translation				
44	40		Intrusion Prevention System (IPS) with stateful signatures				
45	41		Reputation based URL Filtering				
46	42		Anti-malware protection by using a sandbox environment for detonating and observing threats. Both box or cloud based solution acceptable				
47	43		Deep inspection of .exe, .pdf and MS Office suite files including .doc, .ppt, .xls and custom files for anti-malware protection with detailed reporting				
48	44		Provision to quarantine infected hosts and blocks communication				
49	45	Management and Troubleshooting	Device should have Console, Telnet or Web for management				
50	46		Devices should support Software upgrades through Web or CLI				
51	47		Devices should support SNMPv2 and SNMPv3				
52	48		Extensive debugs on all protocols				
53	49		Device should have flow monitoring and accounting services				
54	50		Device should have SLA monitoring features with support for Sessions, packets & bandwidth usage				
55	51		Device should support configuration rollback to a previous settings				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
56	52	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
57	B	Technical Specifications for Modular L3 Core Switch					
58	1	Architecture	The switch should be a Layer 3 stackable switch with min 24 x 1/10G SFP+ ports				
59	2		Switch shall have expansion capability to support another 12/16/24 x 1G or 10G ports				
60	3		Should support 1000BASE-SX, -LX/LH, 10G-SR, 10G-LR interfaces				
61	4		Should have external ports for storage of OS and configuration files.				
62	5		Switch should have stacking capacity of minimum 160Gbps. Ports and cables for the same shall be provided from day 1				
63	6		Should support In Service Software Upgrade with minimal downtime				
64	7		Should have Internal Redundant Hot swappable Power supply and Fans				
65	8	Performance	Minimum Switching bandwidth shall be worked as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 2 Full Duplex)) for line rate performance. Offers not meeting this calculation shall be rejected.				
66	9		Similarly, minimum forwarding rate for line rate performance in (Mpps), shall be calculated as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 1.48Mpps). Offers not meeting this calculation shall be rejected.				
67	10		Shall have configurable 128K MAC addresses				
68	11		Configurable up to 64K IPv4 and 64K IPv6 routes				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
69	12		Configurable up to 32K multicast routes				
70	13		Should Support Jumbo Frames up to 9200 bytes				
71	14	Layer 2 Feature Requirements	Should Support 4000 VLAN's and VLAN ID's				
72	15		Should Support 802.1Q, 802.1D, 802.1W, 802.1S				
73	16		Should Support Link Aggregation Control Protocol 802.3ad				
74	17		Should Support Unidirectional Link Detection Protocol (UDLD)				
75	18		Should Support Port Mirroring, Remotely monitoring ports in a Layer 2 switch network from any other switch in the same network.				
76	19		Should Support Internet Group Management Protocol (IGMP) v1,v2,v3 and IGMP Snooping for IPv4 and IPv6 MLD v1 and v2				
77	20		Should support Q-in-Q VLAN extended support for multiple S-VLANs per access interface				
78	21		Should support ACL based VLAN Assignment and Routed VLAN Interfaces				
79	22		Should support DHCP relay for L2 VLAN's & L3 Interfaces				
80	23		Should support IPv4 and IPv6 routing in hardware				
81	24		Support for IPv4 unicast routing capability (static, RIP and OSPF protocols) to forward IPv4 traffic through configured interfaces and any license required for the same shall be provided from day 1				
82	25		Support for IPv6 unicast routing capability (static, RIP and OSPF protocols) to forward IPv6 traffic through configured interfaces and any license required for the same shall be provided from day 1				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
83	26	Layer 3 Feature Requirements	Should support BGP Routing for IPv4 and IPv6 with an additional license				
84	27		Support for Virtual routing and forwarding (VRF)-Lite for RIP, OSPF & BGP				
85	28		Support for Multicast routing protocols PIM sparse mode (PIM-SM), PIM dense mode (PIM-DM), PIM Source Specific Multicast (PIM-SSM).				
86	29		Should support VRRP for IPv4 and IPv6				
87	30	Security Features. Should have necessary licenses and subscriptions for:-	Standard and extended IP ACLs, Port-based ACLs, VLAN ACLs				
88	31		Port Security to secure the access to any access or trunk port based on MAC address. It must limit the number of learned MAC addresses to deny MAC address-flooding.				
89	32		DHCP Snooping to prevent malicious users from spoofing a DHCP server and sending out bogus addresses or attacks such as ARP poisoning.				
90	33		Dynamic ARP Inspection (DAI) to ensure user integrity by preventing malicious users from exploiting the insecure nature of the ARP protocol.				
91	34		Prevents malicious user from spoofing or taking over another user's IP address				
92	35		Support for IEEE 802.1ae based MACSec on all 10G Interfaces at wirespeed to ensure link-layer data confidentiality, data integrity, and data origin authentication.				
93	36	QoS	802.1p class of service (CoS) and differentiated services code point (DSCP) field classification are provided, using marking and reclassification on a per-packet basis by source and destination IP address, MAC address, or Layer 4 TCP/UDP port number.				
94	37		Control-plane and data-plane QoS ACLs on all ports help ensure proper marking on a per-packet basis				
95	38		Should Support Eight egress queues per port and Strict priority queuing helps ensure that the highest-priority packets are serviced ahead of all other traffic.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
96	39		Should Weighted Tail Drop (WTD) to provide congestion avoidance at the ingress and egress queues				
97	40	Management	Secure Shell (SSH) Protocol, Simple Network Management Protocol Version 3				
98	41		Should provide real-time network event detection and onboard automation using event Managers				
99	42		CLI support to provide a common user interface and command set with all switches				
100	43		Trivial File Transfer Protocol (TFTP), Network Timing Protocol (NTP)				
101	44	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
102	C	Technical Specifications for Server-Farm or DMZ Switch					
103	1	Hardware & Interface Requirements	The switch should be an enterprise class stackable switch with minimum 48 x 10/100/1000 Ethernet Port and 4 x 10G SFP+ ports				
104	2		Switch should connect to Core Switch with minimum 2 x 10G link per switch and using 3~5Mtr 10G DAC Cables				
105	3		Switch should have Dual Internal RPS and front to back airflow fans				
106	4	Performance Requirements	Switch should support stacking of up to 8 switches with a stacking bandwidth of 80Gbps or more. Additional module or license required for enabling stacking should be proposed from day 1				
107	5		Minimum Switching bandwidth shall be worked as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 2 Full Duplex)) for line rate performance. Offers not meeting this calculation shall be rejected.				
108	6		Similarly, minimum forwarding rate for line rate performance in (Mpps), shall be calculated as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 1.48Mpps). Offers not meeting this calculation shall be rejected.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
109	7	Layer 2 Switching	Switch should support minimum 16000 MAC addresses per system				
110	8		Switch should support 9K Jumbo frames				
111	9		Switch Should support minimum 4000 VLAN's and VLAN ID's				
112	10		Switch Should support Port-based VLAN and MAC-based VLAN				
113	11		Switch Should support 802.1Q VLAN tagging				
114	12		Switch should support IEEE 802.1ad Q-in-Q tunnelling				
115	13		Switch should support IEEE 802.1ae Media Access Control Security (MACsec)				
116	14		Switch should support Private VLAN (PVLAN)				
117	15	Layer 3 Routing	Switch should support IPv4 and IPv6 static routing				
118	16		Switch should support OSPFv2/v3, VRRP, VRRPv6 and VRF-Lite with optional advanced license				
119	17		Switch should support Policy Based Routing				
120	18		Switch should support Unicast reverse-path forwarding (uRPF)				
121	19		Switch should support Layer 2 and Layer 3 QoS				
122	20		Switch should support Strict Priority (SP) and SDWRR scheduling methods				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
123	21	QoS	Switch should support Marking, policing, and shaping				
124	22		Switch should support L2-L4 classification criteria, including Interface, MAC address, Ethertype, 802.1p, VLAN, IP address, DSCP/IP precedence, and TCP/UDP port numbers				
125	23		Switch should support minimum 8 hardware queues per port				
126	24		Switch should support Flexible CoS (outer 802.1P marking)				
127	25	Multicast Support	Should support IGMP v1/v2/v3, PIM-SM, PIM-SSM & PIM-DM				
128	26		Support minimum 1000 IGMP snooping entries				
129	27		Should support IPv6 multicast snooping MLD v1/v2				
130	28		Should support Multicast Source Discovery Protocol (MSDP)				
131	29		Should support PIM for IPv6 multicast				
132	30	System Management & Administration	Switch should support SNMPv2 and SNMPv3				
133	31		Switch should support IPv6 Management including Neighbour discovery, Logging, Telnet, SSH, Web, SNMP, NTP and DNS				
134	32		Switch should support configuration rollback				
135	33		Should support DHCP Server, Proxy, Client, Relay, Helper and VR aware DHCP				
136	34		Should support RADIUS and TACACS+ authentication				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
137	35		Switch should support sFlow flow management				
138	36		Switch should support local and remote port mirroring				
139	37		Switch should be manageable through CLI, Web Interface, SSHv2 and HTTP/HTTPs				
140	38		Configuration backup via FTP/secure copy				
141	39		Switch should support Port, VLAN and Router based Access control lists (ACLs) and minimum 1500 ACL Entries in hardware				
142	40		Should have ability to add/remove/change ACL entries in middle of list (ACL editing)				
143	41	Security Features	The switch should support 802.1x Authentication and MAC Authentication Bypass for clients which do not support 802.1x				
144	42		The switch should support Web Authentication for Guest users and URL Redirect to redirect all the http access to predefined URL.				
145	43		The switch should support VLAN Assignment – dynamically assign VLAN assigned based on the client role.				
146	44		The switch should support Downloadable ACLs – These ACLs (access policies) are not defined on the switch, they are downloaded from Policy engine during authentication and applied on the switch.				
147	45		Should support Hitless L2 and L3 failover in case of a routing engine failure in a stack				
148	46	HA	Should support Non Stop Software upgrade for a full stack with a single command				
149	47		Should Support RPS from Day-1. Internal RPS is preferred				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
150	48	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
151	D	Technical Specifications for 48-Port Edge Switch					
152	1	Hardware & Interface Requirements	The switch should be an enterprise class stackable switch with minimum 48 x 10/100/1000 Ethernet Port and 4 x 1/10G SFP+ ports				
153	2		The switch should be available in PoE+ and non-PoE versions				
154	3		Switch should have Dual Internal RPS				
155	4	Performance Requirements	Switch should support stacking of up to 8 switches with a stacking bandwidth of 80Gbps or more. Any additional module or license required for enabling stacking should be proposed from day 1				
156	5		Minimum Switching bandwidth shall be worked as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 2 Full Duplex)) for line rate performance. Offers not meeting this calculation shall be rejected.				
157	6		Similarly, minimum forwarding rate for line rate performance in (Mpps), shall be calculated as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 1.48Mpps). Offers not meeting this calculation shall be rejected.				
158	7	Layer 2 Switching	Switch should support minimum 16000 MAC addresses per system				
159	8		Switch should support Jumbo frames – 9,000 bytes				
160	9		Switch Should support minimum 4000 VLAN's and VLAN ID's				
161	10		Switch Should support Port-based VLAN and MAC-based VLAN				
162	11		Switch Should support 802.1Q VLAN tagging				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
163	12		Switch should support IEEE 802.1ad Q-in-Q tunnelling				
164	13		Switch should support IEEE 802.1ae Media Access Control Security (MACsec)				
165	14		Switch should support Private VLAN (PVLAN)				
166	15	Layer 3 Routing	Switch should support IPv4 and IPv6 static routing				
167	16		Switch should support OSPFv2/v3, VRRP, VRRPv6 and VRF-Lite with optional advanced license				
168	17		Switch should support Policy Based Routing				
169	18		Switch should support Unicast reverse-path forwarding (uRPF)				
170	19	QoS	Switch should support Layer 2 and Layer 3 QoS				
171	20		Switch should support Strict Priority (SP) and SDWRR scheduling methods				
172	21		Switch should support Marking, policing, and shaping				
173	22		Switch should support L2-L4 classification criteria, including Interface, MAC address, Ethertype, 802.1p, VLAN, IP address, DSCP/IP precedence, and TCP/UDP port numbers				
174	23		Switch should support minimum 8 hardware queues per port				
175	24		Switch should support Flexible CoS (outer 802.1P marking)				
176	25		Should support IGMP v1/v2/v3, PIM-SM, PIM-SSM & PIM-DM				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
177	26	Multicast Support	Support minimum 1000 IGMP snooping entries				
178	27		Should support IPv6 multicast snooping MLD v1/v2				
179	28		Should support Multicast Source Discovery Protocol (MSDP)				
180	29		Should support PIM for IPv6 multicast				
181	30	System Management & Administration	Switch should support SNMPv2 and SNMPv3				
182	31		Switch should support IPv6 Management including Neighbour discovery, Logging, Telnet, SSH, Web, SNMP, NTP and DNS				
183	32		Switch should support configuration rollback				
184	33		Should support DHCP Server, Proxy, Client, Relay, Helper and VR aware DHCP				
185	34		Should support RADIUS and TACACS+ authentication				
186	35		Switch should support sFlow flow management				
187	36		Switch should support local and remote port mirroring				
188	37		Switch should be manageable through CLI, Web Interface, SSHv2 and HTTP/HTTPs				
189	38		Switch should support the IEEE 802.3az standard for Energy Efficient Ethernet (EEE) functionality, reducing power consumption of copper ports during periods of low link utilization				
190	39		Configuration backup via FTP/secure copy				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
191	40	Security Features	Switch should support Port, VLAN and Router based Access control lists (ACLs) and minimum 1500 ACL Entries in hardware				
192	41		Should have ability to add/remove/change ACL entries in middle of list (ACL editing)				
193	42		The switch should support 802.1x Authentication and MAC Authentication Bypass for clients which do not support 802.1x				
194	43		The switch should support Web Authentication for Guest users and URL Redirect to redirect all the http access to predefined URL.				
195	44		The switch should support VLAN Assignment – dynamically assign VLAN assigned based on the client role.				
196	45		The switch should support Downloadable ACLs – These ACLs (access policies) are not defined on the switch, they are downloaded from Policy engine during authentication and applied on the switch.				
197	46		The switch should support Change of Authorization – Any change in access policy can be pushed to all the clients dynamically from NAC server , the clients need not re-authenticate to get the new access policies.				
198	47	PoE	Opted project PoE switches shall have all PoE ports. All Ports shall be capable of delivering a minimum of full class-III PoE (15.4W) concurrently.				
199	48	HA	Should support Hitless L2 and L3 failover in case of a routing engine failure in a stack				
200	49	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
201	E	Technical Specifications for 24-Port Edge Switch					
202	1	Hardware & Interface Requirements	The switch should be an enterprise class stackable switch with minimum 24 x 10/100/1000 Ethernet Port and 4 x 1/10G SFP+ ports				
203	2		The switch should be available in PoE+ and non-PoE versions				
204	3		Switch should have Dual Internal RPS				
205	4		Switch should support stacking of up to 8 switches with a stacking bandwidth of 80Gbps or more. Any additional module or license required for enabling stacking should be proposed from day 1				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
206	5	Performance Requirements	Minimum Switching bandwidth shall be worked as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 2 Full Duplex)) for line rate performance. Offers not meeting this calculation shall be rejected.				
207	6		Similarly, minimum forwarding rate for line rate performance in (Mpps), shall be calculated as ((Total number of 10G Ports + Total number of 1G ports + Stacking BW) x 1.48Mpps). Offers not meeting this calculation shall be rejected.				
208	7	Layer 2 Switching	Switch should support minimum 16000 MAC addresses per system				
209	8		Switch should support Jumbo frames – 9,000 bytes				
210	9		Switch Should support minimum 4000 VLAN's and VLAN ID's				
211	10		Switch Should support Port-based VLAN and MAC-based VLAN				
212	11		Switch Should support 802.1Q VLAN tagging				
213	12		Switch should support IEEE 802.1ad Q-in-Q tunnelling				
214	13		Switch should support IEEE 802.1ae Media Access Control Security (MACsec)				
215	14		Switch should support Private VLAN (PVLAN)				
216	15	Layer 3 Routing	Switch should support IPv4 and IPv6 static routing				
217	16		Switch should support OSPFv2/v3, VRRP, VRRPv6 and VRF-Lite with optional advanced license				
218	17		Switch should support Policy Based Routing				
219	18		Switch should support Unicast reverse-path forwarding (uRPF)				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
220	19	QoS	Switch should support Layer 2 and Layer 3 QoS				
221	20		Switch should support Strict Priority (SP) and SDWRR scheduling methods				
222	21		Switch should support Marking, policing, and shaping				
223	22		Switch should support L2-L4 classification criteria, including Interface, MAC address, Ethertype, 802.1p, VLAN, IP address, DSCP/IP precedence, and TCP/UDP port numbers				
224	23		Switch should support minimum 8 hardware queues per port				
225	24		Switch should support Flexible CoS (outer 802.1P marking)				
226	25	Multicast Support	Should support IGMP v1/v2/v3, PIM-SM, PIM-SSM & PIM-DM				
227	26		Support minimum 1000 IGMP snooping entries				
228	27		Should support IPv6 multicast snooping MLD v1/v2				
229	28		Should support Multicast Source Discovery Protocol (MSDP)				
230	29		Should support PIM for IPv6 multicast				
231	30		Switch should support SNMPv2 and SNMPv3				
232	31		Switch should support IPv6 Management including Neighbour discovery, Logging, Telnet, SSH, Web, SNMP, NTP and DNS				
233	32		Switch should support configuration and image rollback				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
234	33	System Management & Administration	Should support DHCP Server, Proxy, Client, Relay, Helper and VR aware DHCP				
235	34		Should support RADIUS and TACACS+ authentication				
236	35		Switch should support sFlow flow management				
237	36		Switch should support local and remote port mirroring				
238	37		Switch should be manageable through CLI, Web Interface, SSHv2 and HTTP/HTTPs				
239	38		Switch should support the IEEE 802.3az standard for Energy Efficient Ethernet (EEE) functionality, reducing power consumption of copper ports during periods of low link utilization				
240	39		Configuration backup via FTP/secure copy				
241	40	Security Features	Switch should support Port, VLAN and Router based Access control lists (ACLs) and minimum 1500 ACL Entries in hardware				
242	41		Should have ability to add/remove/change ACL entries in middle of list (ACL editing)				
243	42		The switch should support 802.1x Authentication and MAC Authentication Bypass for clients which do not support 802.1x				
244	43		The switch should support Web Authentication for Guest users and URL Redirect to redirect all the http access to predefined URL.				
245	44		The switch should support VLAN Assignment – dynamically assign VLAN assigned based on the client role.				
246	45		The switch should support Downloadable ACLs – These ACLs (access policies) are not defined on the switch, they are downloaded from Policy engine during authentication and applied on the switch.				
247	46		The switch should support Change of Authorization – Any change in access policy can be pushed to all the clients dynamically from NAC server , the clients need not re-authenticate to get the new access policies.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
248	47	PoE	Opted project PoE switches shall have all PoE ports. All Ports shall be capable of delivering a minimum of full class-III PoE (15.4W) concurrently.				
249	48	HA	Should support Hitless L2 and L3 failover in case of a routing engine failure in a stack				
250	49		Should support Non Stop Software upgrade for a full stack with a single command				
251	50	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
252	F		Technical Specifications for Internal DMZ UTM Device				
253	1	Performance Requirements	Firewall Inspection Throughput - 6Gbps or more				
254	2		DPI Throughput - Over 750Mbps				
255	3		Number of Concurrent Users - 500 users				
256	4		IPS Throughput - 2Gbps or more				
257	5		UTM Throughput - 800Mbps or more				
258	6		IMIX Throughput - Over 1.5 Gbps				
259	7		Site-to-Site VPN Throughput - Over 3Gbps				
260	8		Concurrent Session or Connections: 5 Lakhs or more				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
261	9	Interface Requirements	Two x 10GbE SFP+, Four x 1GbE SFP and at least Ten DMZ ports of 1GE copper				
262	10	3-Year Licenses	Deep Packet Inspections, SSL DPI and Stateful Packet Inspection Firewalls, IKEv2 VPN, TLS/SSL/SSH Decryption and Inspection				
263	11		Intrusion Prevention, Gateway Anti-Virus and Anti-Spyware, Client Anti-Virus and Anti-Spyware, Content & URL Filtering, Malware and Ransomware protection				
264	12		24x7 Support				
265	13		Graphic Analyzer Reporting, Logging, NetFlow Monitoring, SNMP, Network Traffic Visualization				
266	14	Other Value-Added Features	Single Sign-on, Voice over IP (VoIP) Security, Policy-based Routing, Route-based VPN, Dynamic Bandwidth Management, DNS Proxy, Load Balancing				
267	15	HA	Active-Active Failover, Dynamic Bandwidth Management, Stateful High Availability, Auto-provisioning of VPN				
268	16	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
269	G	Technical Specifications for Indoor, High-Density Wireless Access Point - Type-1					
270	1	Hardware & Interface	On-site, centralised Controller based hardware appliance or, software installed on our project server to manage and control all of the APs in its network is acceptable.				
271	2		However, any recurring subscription based controller as a cloud-based service, is not acceptable				
272	3		Type: Indoor, dual radio, 5 GHz 802.11ac and 2.4 GHz, 802.11n, 3x3 or 4x4 MIMO with integrated antenna.				
273	4		Four-three spatial stream SU-MIMO for the data rate of 1.3 Gbps (5 GHz) + 300 Mbps (2.4 GHz) to a single client device.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
274	5	Requirements	Auto-sensing, 1Gig Ethernet network interfaces (RJ-45) having support for PoE				
275	6		Onboard Integrated Bluetooth Low Energy (BLE) radio for various IoT functions such as BLE, Way Finding, RTLS, Beacon Announcements etc. Alternately, USB slot / port for use as additional "on AP" storage, Bluetooth beacons, etc acceptable				
276	7		Mounts: To be mounted on Ceiling. Hence, appropriate OEM mounts to be included				
277	8		Console port for out-of-band management and to troubleshoot and resolve any issues				
278	9	Performance Requirements	Support for over 250 associated client devices per radio				
279	10		It is very important that the offered AP to support have for Band Steering, Beamforming and Client/AP Balancing				
280	11		Support for at least 15 BSSIDs per radio.				
281	12		Include any license fees required at the AP to enable all functions necessary for a healthcare project operations.				
282	13		Support for Wi-Fi Multimedia (WMM), Quality of Service (QoS) and VoWiFi				
283	14	Security Features	Support for modern WIFI authentication protocols such as, Pre-shared Key (PSK), Captive Portal, Extensible Authentication Protocol (EAP), 802.11i				
284	15		Essential support for Wireless Security features of WPA2 or later with AES Encryption technology				
285	16		Guest Access functions to include, Guest SSID, Guest VLAN, Captive Portal, Time limits before re-authentication and Access Control Lists (ACL) preventing guest VLAN from accessing internal LAN.				
286	17		802.1X support for RADIUS and Active Directory				
287	18		Support for Off Channel Scanning, WIDS/WIPS essentially without Overlay, Rogue Detection/Containment, without Overlay and 802.11w (Management Frame Protection).				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
288	19	Management	Single Window Interface: Must have the capability to manage all project APs entirely from a single, browser-based management interface is highly essential.				
289	20		Controller and management interfaces should have role-based access controls that allow different functional and security permission settings for different types of users, like help desk technicians versus network administrators				
290	21		Offered AP to support auto-configuration based on Zero/Low Touch Configuration				
291	22		AP shall support Security policy management that allows different security settings to different groups of users.				
292	23		The policy management feature shall essentially have Bandwidth policy management to offer more granular and immediate control of the bandwidth.				
293	24		Monitoring and Reporting: Using various graphs, the offered WIFI solution shall have the ability to monitor the system on a client, AP, application, and port level makes managing the network				
294	25		It is preferred that the AP has the feature of Predictive Heat Mapping for coverage and capacity improvements				
295	26		Adaptive Power: The offered AP shall support dynamic transmit power that allows an AP to dynamically change its transmit power to intelligently increase or decrease coverage cell size				
296	27		Dynamic Channel Adjustment feature to allow the AP to automatically fix itself the source of the interference and rippling the rest of the APs.				
297	28	Other Value-Added Features	Bonjour gateway to support Apple's Zero-touch networking by enabling (or blocking) Bonjour discovery across VLANs or networks.				
298	29		L2 and L3 Roaming between Aps				
299	30		Backward compatibility with legacy WIFI devices and protocols and forward compatibility with software upgrade				
300	31		Built-in co-existence filters to support advanced Rx (receive) to filter out non-802.11 signals				
301	32		It is most vital to have support for WIFI based location tracking intelligence that can be essential to track devices and tags as they move through the project building				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
302	33		Support for Jumbo Frames				
303	34		Support for AP Virtualisation: Support for Single Channel Architecture and Channel Layering is preferred				
304	35		Support for IPTV services like multicasting and multicast NTP				
305	36	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
306	**H**	**Technical Specifications for Indoor, In-wall, In-room Wireless Access Point - Type-2**					
307	1		On-site, centralised Controller based hardware appliance or, software installed on our project server to manage and control all of the APs in its network is acceptable.				
308	2		However, any recurring subscription based controller as a cloud-based service, is not acceptable				
309	3		Type: Indoor, dual radio, 5 GHz 802.11ac and 2.4 GHz, 802.11n, 2x2 MIMO with integrated antenna.				
310	4		Two spatial stream SU-MIMO for the data rate of 867Mbps (5 GHz) + 300 Mbps (2.4 GHz) to a single client device.				
311	5		Auto-sensing, 1Gig Ethernet network interfaces (RJ-45) having support for PoE				
312	6	**Hardware & Interface Requirements**	Two PoE outputs for connecting PoE devices like IP Phone and Nurse-call systems				
313	7		Additionally, Two GigE ports for IPTV and Room High-speed Internet LAN				
314	8		Onboard integrated Bluetooth Low Energy (BLE) radio for various IoT functions such as BLE, Way Finding, RTLS, Beacon Announcements etc. Alternately, USB slot / port for use as additional "on AP" storage, Bluetooth beacons, etc acceptable				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
315	9		Mounts: To be mounted on Wall. Hence, appropriate OEM mounts to be included				
316	10		Console port for out-of-band management and to troubleshoot and resolve any issues				
317	11	Performance Requirements	Support for over 100 associated client devices per radio				
318	12		Include any license fees required at the AP to enable all functions necessary for a healthcare project operations.				
319	13		It is very important that the offered AP to support have for Band Steering, Beamforming and Client/AP Balancing				
320	14		Support for at least 08 BSSIDs per radio.				
321	15		Support for Wi-Fi Multimedia (WMM), Quality of Service (QoS) and VoWiFi				
322	16	Security Features	Support for modern WIFI authentication protocols such as, Pre-shared Key (PSK), Captive Portal, Extensible Authentication Protocol (EAP), 802.11i				
323	17		Essential support for Wireless Security features of WPA2 or later with AES Encryption technology				
324	18		802.1X support for RADIUS and Active Directory				
325	19		Guest Access functions to include, Guest SSID, Guest VLAN, Captive Portal, Time limits before re-authentication and Access Control Lists (ACL) preventing guest VLAN from accessing internal LAN.				
326	20		Support for Off Channel Scanning, WIDS/WIPS essentially without Overlay, Rogue Detection/Containment, without Overlay and 802.11w (Management Frame Protection).				
327	21		Single Window Interface: Must have the capability to manage all project APs entirely from a single, browser-based management interface is highly essential.				
328	22		Controller and management interfaces should have role-based access controls that allow different functional and security permission settings for different types of users, like help desk technicians versus network administrators				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
329	23	Management	Offered AP to support auto-configuration based on Zero/Low Touch Configuration				
330	24		AP shall support Security policy management that allows different security settings to different groups of users.				
331	25		The policy management feature shall essentially have Bandwidth policy management to offer more granular and immediate control of the bandwidth.				
332	26		Monitoring and Reporting: Using various graphs, the offered WIFI solution shall have the ability to monitor the system on a client, AP, application, and port level makes managing the network				
333	27		It is preferred that the AP has the feature of Predictive Heat Mapping for coverage and capacity improvements				
334	28		Adaptive Power: The offered AP shall support dynamic transmit power that allows an AP to dynamically change its transmit power to intelligently increase or decrease coverage cell size				
335	29		Dynamic Channel Adjustment feature to allow the AP to automatically fix itself the source of the interference and rippling the rest of the APs.				
336	30	Other Value-Added Features	Bonjour gateway to support Apple's Zero-touch networking by enabling (or blocking) Bonjour discovery across VLANs or networks.				
337	31		L2 and L3 Roaming between Aps				
338	32		Backward compatibility with legacy WIFI devices and protocols and forward compatibility with software upgrade				
339	33		Built-in co-existence filters to support advanced Rx (receive) to filter out non-802.11 signals				
340	34		It is most vital to have support for WIFI based location tracking intelligence that can be essential to track devices and tags as they move through the project building				
341	35		Support for Jumbo Frames				
342	36		Support for AP Virtualisation: Support for Single Channel Architecture and Channel Layering is preferred				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
343	37		Support for IPTV services like multicasting and multicast NTP				
344	38	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
345	I	Technical Specifications for On-Premise Wireless LAN Controller					
346	1	Architectural & Interface Requirements	Enterprise class WLAN Controller with support for 250 APs, 10,000 concurrent devices and 1024 WLANs				
347	2		Licenses for 250 APs with full feature functionalities as per AP technical requirements specified above. Licenses for centralised control and configuration of 250 APs				
348	3		Proposed WIFI Controller shall share its intelligence between its supported APs to prevent any stoppage of services if the controller fails or the link to the controller fails. The Controller must push the minimum required intelligence to its APs, to make them operate independently should the controller become unreachable.				
349	4		Two GigE interface ports for link redundancy				
350	5		Integration with project AAA, DNS & DHCP servers				
351	6	Other Value-Added Features	Shall manage all requirements of authentication, encryption, VPN connections, IPv4 and IPv6 Layer 3 services				
352	7		Rack mountable with rack mounting Kits				
353	8		Support for Rate Limiting and QoS for priority service like Voice				
354	9		Management via Web user interface, CLI, SNMP v1, v2, v3				
355	10		Meshing of AP, Auto-software upgrade, Automatic channel and power optimization etc				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
356	11	Security Features	Support for WPA, WPA 2, 802.11i and Encryptions of WEP, TKIP, 3DES, AES				
357	12		Client Authentication: 802.1x, MAC address, Captive portal				
358	13		Client Access Control: Via L2 (MAC), L3/4 (IP & Protocol), and L2 level client isolation				
359	14		WIDS/WIPS: Rogue AP detection, DoS attack prevention				
360	15	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
361	J	Technical Specifications for IP Paging cum Back-Ground Music (BGM) System - Networked Power Amplifiers					
362	1	Basic Architectural Needs	DSP based, software configurable, networked, audio power amplifier with project wattage requirement of 2000 Watts or more to support 8 or more zones of various power requirements.				
363	2		The offered Power Amps may operate as multiple systems (as per project needs) or could be modular, or support multiple Power Amp modules. However, they must support IP stacked operations as a single unified unit.				
364	3		The offered system shall support integrated operation with the Project FACP (Fire Panel) to automatically trip the ongoing BGM and activate emergency messages for life-safety compliance.				
365	4		Shall have at least Four internal or external Override Relay Circuits to trigger and control of external 3rd party devices during paging operations				
366	5	Software Requirements	70V/100V and low-impedance outputs shall be configurable over software.				
367	6		DSP functions to support various operations functions such as volume control, ducking, equalization, compressor/limiter, speaker crossover, delay, and output gain etc.				
368	7		Associated software shall support various DSP based configurations and settings including volume control, filters, compressor/limiting, delay, speaker equalization and output sensitivity etc.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
369	8	Other Value-Added Features	Each Power Amps shall have redundant IP based RJ-45 connectors to provide duplicated connectivity to control data and audio functions.				
370	9		The amplifier shall have 100-240V AC power supply input.				
371	10		GPIO-1 support to control and monitor various functional aspects of inputs and outputs				
372	11		Offered system shall have the necessary Interface for emergency/fire alarm systems / Parallel I/O ports for direct interface with fire alarm and emergency equipment with monitored I/O and control inputs, network connection and power supply etc				
373	12		Shall have 12 or more general purpose inputs to play emergency message, and enable zone reset or zone silence etc				
374	13		The Life Safety control interface shall either have a sounder to deliver audible notification of alarm, or will integrate and prove with the sounders of the project Fire Alarm systems.				
375	14		Offered Power Amps shall be rack mountable and must include necessary rack mounting kits.				
376	15	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
377	K	Technical Specifications for IP Paging cum Back-Ground Music (BGM) System - Networked Backend DSP Processors					
378	1	VOIP / SIP Interface	Voice over IP Interface to integrate with Project IP/SIP PBX. Each phone extension to act as (VoIP-1) acts as a real-time networked Paging device - prefixed by a pass-code.				
379	2		The VOIP interface can be add-on or can be integral part of the offered DSP backend system.				
380	3	Mixer Unit	Networked audio mixer system that has the capability of six input channels of background music or user-defined audio and Mic (Phantom power)				
381	4		Support for upto 4 control inputs and outputs each				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
382	5		Software-configurable audio signal processing with gain, filters, and compressor/limiter etc				
383	6	Other Value-Added Features	Shall have separate Ethernet ports for TCP/IP Control / including message playback, event scheduling, VoIP paging interface, logging, and remote access with Email reporting / Time server support				
384	7		Offered system shall be rack-mountable (with rack rails & kits), and shall be placed centrally at the ICT room alongwith the Power Amps and other backend systems				
385	8		Remote control of associated third party systems				
386	9	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
387	L	Technical Specifications for IP Paging cum Music (BGM) System - Front-end Systems					
388	1	Speaker - Type-I	**In-Ceiling Speaker**: 6.5", 2-way system with two drivers, Frequency Range: 60 Hz - 22 kHz, Nominal Sensitivity; 6~15 Watts, Vertical dispersion angle 1000 Hz = 180Deg, Crossover Frequency: 3.5 kHz, Rated Maximum SPL: 105 dB @ 1 m (3.3 ft); 94 dB @ 1 m (3.3 ft), 6W tap, Nominal Impedance: 16 ohms, Transformer Taps: 70V: 96, 3, 1.5 taps, 100V: 6W, 4W, 2W taps. Both screw type as well as clip type fitment acceptable. Corrosion proof casing & material is preferred. Most importantly, the inner cut-out diameter should be 186mm. White Colour is Preferred				
389	2	Speaker - Type-II	**Wall Speaker**: 5.25" two-way loudspeaker system, with low impedance RMS power upto 30 watts, max SPL (1m) 105 dB, low impedance dynamic power of 50 watts or more, frequency response of 70 - 20KHz and Horizontal dispersion angle (1000 Hz) of 180°. Corrosion proofed White Colour material is Preferred				
390	3	Speaker - Type-III	**Outdoor Horn Speaker**: Industrial and outdoor rated compression driver, with rust-free, stainless steel bracket, 100V transformer power taps 30 - 15 - 7.5watts, low impedance dynamic power of over 30 watts, Vertical dispersion angle (1000Hz) of over 150° and Horizontal dispersion angle of over 110°, max SPL (1m) of 120 dB. Full Corrosion proofed White Colour material is Preferred				
391	4	Volume Controller - Type-I	**100 Volt, 120Watts**, Wall volume controller for individual zones, White Colour, 8~10-Step attenuation, 24V (20mA) priority signal relay support. To be supplied with OEM wall mount box. The scope of work involves, laying of last-mile cables and connecting the controllers thru white ISI rated PVC conduits - as per site instructions / on as required basis.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
392	5	**Volume Controller - Type-II**	**100 Volt, 20 Watts**, Wall volume controller for individual rooms, White Colour, 8~10-Step attenuation, 24V (20mA) priority signal relay support. To be supplied with OEM wall mount box. The scope of work involves, laying of last-mile cables and connecting the controllers thru white ISI rated PVC conduits - as per site instructions / on as required basis.				
393	6	**Volume Controller - Type-III (Alternate to Type-II)**	**100 Volt, 36~40Watts**, Wall volume controller for individual rooms, White Colour, 8~10-Step attenuation, 24V (20mA) priority signal relay support. To be supplied with OEM wall mount box. The scope of work involves, laying of last-mile cables and connecting the controllers thru white ISI rated PVC conduits - as per site instructions / on as required basis.				
394	7	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, rack mounting kits, power cords, connectors, cables, Shielded Pair: 20 AWG Audio or Control Bulk Cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM). Any aditional cabling as per the specific requirements of the OEM or as per modified site needs, also included in the scope of allied project works				
395	**M**	**Technical Specifications for Nurse-Call Solution**					
396	1	**Cabling**	Unlike other IP systems, the Contractor is expected to undertake the end-to-end concealed cabling based on the proposed OEM instructions. For cable concealment, he is required to use only white, ISI/BIS rated PVC conduits from the list of approved vendors.				
397	2	**NC Floor Controller**	Controller cum communications node for exchanging data between the connected NC devices and the rest of the Hospital LAN system. Must have redundancy for resilient operation. It shall connect all NC devices over IP and shall spare data bus for all other legacy modules.				
398	3	**Patient Room Call / Cancel Button**	Bedside switch as a Room controller with buzzer for calling the nurse and cancelling a call with colour coded buttons for call, cancel-call and presence. To be integrated with controlling room light.				
399	4	**Room Light Indicator**	Light based indication of calls, presences and reminders with relevant colours with light reflectors for homogeneous illumination outside each room. Can be configured for other functions as a room lamp, a direction lamp and as a ward lamp				
400	5	**Pull Cord Button - For WC**	Integrated bathroom alarm switch with a 2 metre pull cord and a luminous nurse call symbol, finder lights or reassurance light				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
401	6	**Nurse Room Terminal**	IP/SIP based Two-way, hands-free, colour display communication terminal, for use as a communications and information centre within a ward and for use in the relevant nurse room, tightly integrated with project IP-PBX, with all necessary licenses. It shall display all call indications automatically in accordance with the priorities, starting with the highest priority call. These information shall also include the exact type of call with information about the bed number, room or WC call, doctor call etc.				
402	7	**Software & License Requirements**	Integration with project IP-PBX, AAA server, DNS/DHCP, supply and integration of event logging (entire communications system, such as, e.g., calls, presence markings, call acknowledgements, reminders), etc with whole system management and for pushing product software updates. Any additional hardware or server required for the functional utilisation of above NC resources are to be included as part of supply.				
403	8	**Allied Accessories, including Labour Components**	To be supplied alongwith all allied accessories (like power supplies, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM). In addition, the necessary cabling and conduiting alongwith its project integration also forms part of the project.				
404	**N**	**Technical Specifications for Integrated ICT Room Infrastructure Build Arrangements**					
405	1	**Integrated Bundled Infrastructure**	Precision Air Conditioning (PAC), fire suppression, smoke detection, water leak detection, humidity sensor, access control, security cameras etc. Critical systems like UPS and Precision Air-conditioning system shall have N+N redundancy.				
406	2	**General**	Both options of self contained rack or traditional ICT room build arrangements with PAC, Fire alarm detection, automatic Fire control and containment solutions, remote monitoring arrangements with ACS and CCTV are acceptable. Due to the increase in volume, the room based option shall have 40% additional capacity to the sizes and margins to the containerised rack option indicated below				
407	3	**Load**	Capacity of IT Load (Total) that are to be split between multiple racks shall be 20KVA				
408	4	**Useable Rack Space**	Over 90U				
409	5	**PAC**	Precision Air conditioner with variable capacity cooling of 2 x 20kW, heater and humidifier to cater the above indicated IT load of 20 KVA for total 3 or more racks				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
410	6	UPS	20 KVA – rack mount modular UPS, with 10~15 mins battery backup in N+1 topology with P.F. up to 0.9 & efficiency more than 92%. Both UPS & Battery should be mounted inside the offered rack, and must be synchronised in Active-Active mode with installed 3rd party UPS of the site.				
411	7	Fire Control System	NOVEC 1230 Gas based fire suppression system for all racks - 30Kgs				
412	8	Electrical Distribution	Electrical Power Distribution Panel with 80A 3Ph, 415V with MCCB and 6 in number Standard Rack 16 socket PDU (Vertical), (12 IEC C13 & 4 IEC C19 compliant) Power panel				
413	9	Fire Detection	Intelligent Fire detection, Alarm system as per NFPA75 standards				
414	10	Remote Monitoring & Diagnostics	Detailed Remote Monitoring & Diagnostics (Temp monitoring, Humidity monitoring, Door switch sensor, Water Leak sensor, Beacon Alarm, Event alerts, Email notification) over wireless and LAN				
415	11	KVM over IP	KVM over IP switch with Full HD resolutions of over 1920 x 1080, FIPS 140-2 with level 1 or better security standards with dual on-board NICs and dual power supplies. Should have the provision for a single console to monitor multiple enclosures, over LAN, irrespective of distances. Vendors must offer at least 24-Port IP KVM Switch with all cables and connectors (to connect multiple servers and other network devices) and 1U foldable 18" or larger LED Monitor, Keyboard, Mouse with all necessary licenses to manage entire ICT room resources simultaneously.				
416	12	Other Value-Added Essentials	Door Switch Sensor, Water Leak Sensor, Email Notifications, Motion based Video Recordings, Biometric Access Control, Beacon Alarm, etc				
417	13	Allied Accessories	To be supplied alongwith all allied accessories (like Main Incomer Cable Size - CU Flexible Cable (4C x 10 SQMM), power supplies, rack mounting kits, power cords, connectors, cables, Shielded Pair: 20 AWG Audio or Control Bulk Cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
418	O	Technical Specifications for SIP Telephony Gateway cum Call centre based Help Desking					
419	1	Core System	Core System to support up to 1500 IP/Digital/Analog Extension & should be 100% Non-Blocking system				
420	2		Offered system must operate in IP signalling at all levels. OEM products using trunking or VOIP cards for interconnects between various Gateways and/or Voice Servers are not being considered				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
421	3	Description	Preference is being given for PBX systems with their call manger operates as a VM instance from our ICT servers / Datacentre.				
422	4		It is preferred that the proposed PBX Core software should be running on Linux OS loaded over Hypervisor				
423	5	System Redundancy	The IP PBX should be running in fully redundant (active-active or active-passive) mode as a Virtual Machine meeting the current and future requirement.				
424	6		Should have Redundant Call managers in hot standby configuration, (the hot standby server / VM should take over the communications in the campus in the event of a failure of a physical server without dropping established calls). There should not be any re registration process for the media gateways or end points to the standby server while it takes over the communications transparently.				
425	7		OEMs unable to deploy the IP PBX in a virtualised environment, he has to offer along with needed redundant appliance servers with relatively mid-level server (with minimum Quad core, 16GB RAM, RAID and dual power supplies) to ensure no performance degradation.				
426	8	Day-1 Requirement	Proposed IP PBX must deliver a BHCC of over 40,000 calls at minimum.				
427	9		System shall have support for 10 CO trunks for tight integration with existing analog BPL PBX. Integration with the existing PBX and its numbering schema planning would be Contractor responsibility.				
428	10		200 Softphone licenses with audio, wireless mobility, IM and video capability for executives on (Windows) Environment with click to call through web application for all users				
429	11		Concurrent 200 Mobility (VoWLAN support), Licenses for Executive users.				
430	12		02 Seater inbound agent with one supervisor Call centre with voice, email and chat support, features & capabilities				
431	13		Call recording System should have the capability, resources and licences to record upto 10 extensions on as required basis				
432	14		Support to upto 10 (ten) Analog CO bi-directional trunks				
433	15		Two (02) independent E1 PRI /PRA bi-directional trunks. Two PRI ports on single card is not accepted for the reasons of redundancy.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
434	16		Additional headroom of 25% licenses to be provided on the Day-1, based on the phone requirements projected at BoM.				
435	17	Scalability	PBX system should support over 1500 users and 3000 extensions				
436	18		Scalability to 10 Seater Call Centre				
437	19	IVR	SIP based IVR Supporting 10 channels on day 1 and scalable to minimum 30 channels				
438	20	Trunk Support	Support for SIP trunks is also desired				
439	21		Expandability option 04 (Four) ISDN PRI bi-directional trunks on the same offered platform				
440	22	Licenses	Additional headroom of 25% licenses to be provided on the Day-1, based on the phone requirements projected at BoM. Proof to be provided				
441	23		User reserves the right to interchange between Analog or IP or SIP or Soft phone based on evolving communication requirements and towards this, no additional license charges shall be levied at any point of time.				
442	24		Full licenses for the functions indicated for / under Day-1 requirements				
443	25		It is most important for the bidders and OEMs to note that the licenses, where applicable have to be mentioned/indicated/accounted clearly				
444	26	Interface Requirements	Call Centre / Helpdesk Agent with ACD Interface				
445	27		CTI Interface with Pop-up on the Screen				
446	28		CDR Interface along with a Call accounting package for reporting external calls along with the costs associated. The call accounting package should retrieve the call details from the PBX using File transfers over IP network, and should not rely on serial interface or have dedicated real-time retrieval of the CDRs.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
447	29		Provisioning of CRM package with Telephone Directory Management software, as part of CC features				
448	30		4-Port Voice Mail Interface with license				
449	31	Value-Added Feature Requirements	Support for internal Announcements				
450	32		Music on Hold				
451	33		Remote Announcements over Speaker phones				
452	34		Support to "Click to Call" functionality from web based applications				
453	35	Minimum Helpdesk Requirements	The offered Helpdesk cum Call Centre must have management utilities for system administration, capturing call reports, monitoring system resource utilization, and managing data				
454	36		The system must support embedded / centralised DNS/DHCP settings and have its own NMS to configure and analyse voice system, line errors and parameters such as latency, Bandwidth Management and Voice quality and system configuration tools, etc				
455	37		Must be able to view details on incoming and outgoing calls; such as length of call, caller identification, and routing info etc				
456	38		The system must have customized Automated Attendants or IVR based announcements in order to set different messages and call routing options based on time of day and day of week criteria.				
457	39		The system must support pre-record announcements, exam related instructions, holiday greetings, and public messages in multiple languages (essentially in Malayalam, English, Hindi).				
458	40		System must provide callers with valuable information such as wait time, position in queue, and general information etc.				
459	41		Helpdesk must have the capability to respond to online chat and service related emails				
460	42		The SIP based Interactive Voice Response (IVR) Services must provide holding callers the options to wait, leave a voice message, or transfer to another group.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
461	43		The system Supervisors should be provided with features and facilities like call Barge-in / Listen in functionality to monitor their subordinates' phone call responses.				
462	44		In compliance to the regulations, the associated Call Recording features must be to record all calls of designated extensions (defined through the management application) automatically. It must also have a built-in search facility to quickly search for desired call by date, time, parties, length, or target extension number.				
463	45		System must support 3rd party interface for CDMA / GSM gateway based bulk SMS blasting to inform our patients and registered visitors with updates and schedules.				
464	46		The system must cater for all feature and application licenses with no additional support fees from day-1				
465	47		Support Meet-Me and Bridge Conferences as defined in the relevant sections in the main documentations and the Day-1 requirements indicated above				
466	48		Offered System must cater for all necessary resources, licenses and hardware for scheduling and recording 24 port/party single bridge audio & desktop video conference software with call recording, web scheduling and call blasting				
467	49	**Conferencing Bridge Requirements**	The system must have seamless interaction and integration with the AV Conference facility to be installed as part of the Phase-III. The OEM is required to give an undertaking that his/her offered system will have tight integration with all 3rd party audio and web conference systems that can be utilised for power point presentations, desktop/application sharing, virtual classrooms, webinars, video streaming, white board drawings and annotations etc. All documents in support of this statement are to be submitted				
468	50	**Integration with Existing PBX**	Tight integration with existing analog PBX over CO trunks is an essential requirement				
469	51	**Zonal Paging**	SIP/IP Desk phones for the adjacent Services Block to be connected with the local Analog PA system for conducting Public Announcements with Services (MEP) building				
470	52	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
471	53	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
472	P	Technical Specifications for SIP/IP Telephony Handsets					
473	1	Common Criteria for all Phones	OEM IP Phones or SIP Phones with Matching or Higher Technical and Feature sets are Acceptable. However, the proposed SIP phones must have built-in security features like SIP-TLS or higher encryption standards				
474	2		Display/Housing: Touch enabled Colour display with over 7" of display area. Phones must have internal (built-in) or external HD quality video camera for video calling				
475	3		Soft / fixed Feature Buttons: - Volume up/down (separate volume levels for the handset, speaker, and ringer), LED buttons for Mute, Speaker, Headset. - Menu button (browser, options and settings access), Telephony application button to return to main telephone screen. - Buttons of Contacts, Call logs, Voice mail Message. - Onscreen soft QWERTY keyboard for contact search and dial				
476	4		Soft / fixed Programmable buttons: - 4 soft key buttons for Hold, Transfer, Conference etc. - Admin keys/functions accessible through touch screen				
477	5		User-friendly Mobile-Phone style menu with access to most often used features like call forwarding, Park, Settings etc. On screen status indication for activated features like call forwarding				
478	6		Speakerphone: High quality, wide-band G722.2 two-way hands-free speaker and microphone.				
479	7		The set must be compatible to all types of hearing with support to TTD acoustic coupler.				
480	8		Message Waiting Indicator: Must have message wait and visual ringer alerts.				
481	9		Personalized Ring Patterns: Must have at least four Ring tones/patterns				
482	10		Headset Support: Yes for Bluetooth				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
483	11	High-end Boss SIP/IP Phones (Type - I) - for Executive Officers, HODs	Phone Applications: o Centralized Call Log and Contact application. o Upto 100 Contacts in phone storage with additional memory for Call Log (Missed, Incoming, Outgoing calls). o Access to centralised directory and Voice applications on DC. - Rapid session shift feature that allows seamless move of the call from phone to mobile or tablet or PC - Support audio calling with escalation to video calls function with H264 video codec				
484	12		Upgradeable Firmware: Firmware should be upgradable.				
485	13		Mounting: Desk or wall mountable, adjustable display angles with optional wall mount adapter.				
486	14		Must have built-in IEEE 802.3af Power over Ethernet (PoE) class 2 / 3 support.				
487	15		Connectivity: RJ45 (LAN using SIP / H.323)				
488	16		Codecs: G.711, G.729a/b, g.				
489	17		QoS Options: • TCP/UDP/RTP/RTCP/SRTP • RSVP • LLDP/LLDP-MED (inc VLAN assignment) • ARP/DNS • 802.1Q (Layer 2 QoS) • VLAN Separation • DiffServ (Layer 3 QoS) • Port Range (Layer 4 QoS) • 802.1X (MD-5) and TLS				
490	18		Must have SNMP Support				
491	19		Support to Static or dynamic IP address assignment.				
492	20		Two port full-duplex 10/100/1000 BaseT Ethernet switch for PC pass-through connection.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
493	21	Mid-Level Phones for Managers, Key-Officials, Receptionists, PA & Operator Consoles (Type - II)	Backlit Display – with over 5 line 20 characters with adjustable display angle.				
494	22		Fixed Feature Buttons: Over 15 Four-way navigation button. - Volume up/down (separate volume levels for the handset, speaker, and ringer), Buttons for Mute, Speaker, Headset. - Menu button for accessing (options and settings) - Dedicated button for Hold, Conference, Transfer, Drop. - Button for display of Contacts, Call logs, Redial, Voicemail Messages.				
495	23		Programmable Buttons: - 15 or more programmable buttons – with paperless labels.				
496	24		User-friendly Mobile-Phone style menu with access to most often used features like call forwarding, Park, Settings etc. On screen status indication for activated features like call forwarding				
497	25		Speaker Phone: High quality two-way hands-free speaker and microphone.				
498	26		Hearing Aid Compatible Set: The set must be compatible to all types of hearing with support to TTD acoustic coupler.				
499	27		Message Waiting Indicator: Must have message wait and visual ringer alerts.				
500	28		Personalized Ring Patterns: Must have at least five Ring tones/patterns				
501	29		Headset Socket: Yes.				
502	30		Phone Applications: o Centralized Call Log and Contact application. o Over 60 Contacts in phone storage with additional memory for Call Log (Missed, Incoming, Outgoing calls). o Access to centralised directory and Voice applications on DC, thru QWERTY alphabet keyboard				
503	31		Upgradeable Firmware: Firmware should be upgradable.				
504	32		Expansion: Module interface – Must support additional expansion modules, on as required basis upto 32 buttons				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
505	33		Mounting: Desk or wall mountable with optional wall mount adapter.				
506	34		Must have built-in IEEE 802.3af Power over Ethernet (PoE) class 2 support.				
507	35		Connectivity: RJ45 (LAN using H.323) – Dual 10/100/1000 Base T Ethernet ports				
508	36		Codecs: G.711, G.723.1, G.722, G.729a/b Dynamic Jitter buffer, Echo cancellation, Comfort Noise, Automatic Gain control.				
509	37		QoS Options: UDP Port Selection, DiffServ and 802.1p/Q (VLAN)				
510	38		SNMP Support: Must have SNMP Support				
511	39		IP Address Assignment: Support to Static or dynamic IP address assignment.				
512	40		Ethernet Port of PC/Laptop: Must have one LAN port to connect Laptop or PC with VLAN separation.				
513	41		In addition to the above features, the Operator Console phones will have support to 5 line x 20 character colour display and Noise cancelling Wireless (Bluetooth 2.0 or later) Headsets				
514	42		Backlit Display/Housing: with over 3 line x 15 characters with adjustable display angle.				
515	43		Fixed Feature Buttons: Over 15 Four-way navigation button. - Volume up/down (separate volume levels for the handset, speaker, and ringer); Buttons for Mute, Speaker, Headset. - Menu button for accessing (options and settings) - Dedicated button for Hold, Conference, Transfer, Drop. - QWERTY keyboard for central directory search and dial for call by name				
516	44		Programmable buttons: - 8 or more programmable buttons – with paperless labels.				
517	45		Mobile phone type Features Menu: User-friendly Mobile-Phone style menu with access to most often used features like call forwarding, Park, Settings etc. On screen status indication for activated features like call forwarding				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
518	46	Regular User SIP/IP Phone (Type - III)	Speakerphone: High quality two-way hands-free speaker and microphone.				
519	47		Hearing Aid Compatible Set: The set must be compatible to all types of hearing with support to TTD acoustic coupler.				
520	48		Message Waiting Indicator: Must have message wait and visual ringer alerts.				
521	49		Personalized Ring Patterns: Must have at least five Ring tones/patterns				
522	50		Headset Socket: Yes.				
523	51		Phone Applications: o Centralized Call Log and Contact application. o Upto 60 Contacts in phone storage with additional memory for Call Log (Missed, Incoming, Outgoing calls). o Access to centralised directory and Voice applications on DC.				
524	52		Upgradeable Firmware: Firmware should be upgradable.				
525	53		Mounting: Phone should have optional Desk or wall mountable adapter.				
526	54		Must have built-in IEEE 802.3af Power over Ethernet (PoE) class 2 support.				
527	55		Connectivity: RJ45 (LAN using H.323) – Dual 10/100/1000 Base T Ethernet ports				
528	56		Codecs: G.711, G.723.1, G.722, G.729a/b Dynamic Jitter buffer, Echo cancellation, Comfort Noise, Automatic Gain control.				
529	57		QoS Options: UDP Port Selection, DiffServ and 802.1p/Q (VLAN)				
530	58		Must have SNMP Support				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
531	59		Support to Static or dynamic IP address assignment.				
532	60		Ethernet Port of PC/Laptop: Must have one LAN port to connect Laptop or PC with VLAN separation.				
533	61	Room SIP/IP Phone (Type - IV) - for all other users	Basic Wall mountable SIP Phone				
534	62		Fixed Feature Buttons: - Volume up/down (separate volume levels for the handset, speaker, and ringer); Buttons for Mute, Speaker, Headset. - Menu button for accessing (options and settings)				
535	63		Programmable buttons: - 3 or more programmable buttons – with paperless labels.				
536	64		Speakerphone: Two-way hands-free speaker and microphone - preferred option				
537	65		Hearing Aid Compatibility: The set must be compatible to all types of hearing with support to TTD acoustic coupler.				
538	66		Message Waiting Indicator: Must have message wait and visual ringer alerts.				
539	67		Personalized Ring Patterns: Must have at least five Ring tones/patterns				
540	68		Firmware should be upgradable.				
541	69		Phone should have optional Desk mountable adapter.				
542	70		Must have built-in IEEE 802.3af Power over Ethernet (PoE) class 2 support.				
543	71		Connectivity: RJ45 (LAN using H.323)				
544	72		Codecs: G.711, G.723.1, G.729a/b, Dynamic Jitter buffer, Echo cancellation, Comfort Noise, Automatic Gain control.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
545	73		QoS Options: UDP Port Selection, DiffServ and 802.1p/B (VLAN)				
546	74		SNMP Support: Must have SNMP Support				
547	75		IP Address Assignment: Support to Static or dynamic IP address assignment.				
548	76	Other Value-Added Features	List other value-added features, if any that are useful to the Buyer				
549	Q	Technical Specifications for Server Virtualisation					
550	1	Hypervisor Type	Bare Metal virtualization hypervisor. Type-1				
551	2	Licensing	Only offers with One-time costs are been considered. Hence, OEM products with Recurring OPEX charges are NOT to be proposed. Accordingly include all licenses as applicable to the offer				
552	3	Guest OS Licenses	Should have built-in licenses to run upto 08 concurrent VMs of Windows OS or Linux, with scalability for another 20				
553	4	Physical Servers	Virtualisation to be achieved between two proposed project servers and one existing blade server.				
554	5	Scalability	Hot plug feature to enable virtual storage and network devices to be added to or removed from virtual machines without disruption or downtime.				
555	6	Load Balancing	Must have a built-in dynamic load balancing feature to deliver the right resource to the right application based on business priority; allowing applications to shrink and grow as needed.				
556	7	Granular Access Control	The proposed solution must have Role based Privileges assignment over the AAA or RADIUS or AD				
557	8	Guest OS Support	Must support Microsoft (2008, 2012, 2016 incl. all its releases, and Windows Desktop Versions), and various Linux flavours like Debian, Redhat, Ubuntu, Mint etc				
558	9	System Upgrading &	Must incorporate centralised and integrated tools for version upgrade and system patching of Hypervisor				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
559	10	Patching	Similarly, the system must incorporate centralised and integrated tools for patching the Guest OS and the VMs				
560	11	Live VM Snapshot	Hypervisor must have the capability to take snapshot of a Live VM (while the Guest OS is running) for the purpose of backup or rollback.				
561	12	API for Backup	The offered Hypervisor must have the necessary proven APIs, Plugins and tools for the smooth integration with the Backup (both primary and secondary) systems of the project. Documentary profs to be submitted)				
562	13	Auto Hosts Deployment	Must have the ability to deploy Virtualisation Hosts, in an unattended manner using centralised or integrated host deployment tools				
563	14	VM Templates	Must have the capability to create and store Master Templates or Images and deploy future VMs from them.				
564	15	Tiered VM Templates	Should have the ability to deploy "Construct" of VM; i.e., multiple VM applications from a single template				
565	16	Host Profiles	The system must have the provision to capture entire Host Configuration (Security, Network, Storage etc) as a Master Template, in order to apply in other hosts or to use as a "Check Compliance" across Hosts				
566	17	Storage Profiles	Must have the ability to categorise resources based on its capabilities (RAID levels, HA etc) in order to enable tested and compliant placement of workload based storage requirements.				
567	18	Resource Pooling	Hypervisor must have the capability to sub-partition and prioritise any/all physical resources (CPU, RAM etc) within a cluster/pool and hierarchically associate them with the groups of VMs				
568	19	P2V and V2V	Must have the capability to convert a Physical system to a VM host				
569	20	Orchestration of Workflows	The offered system must have the tools to automate the manual tasks to automated workflow engines				
570	21	Migration Compatibility	Live VM migration should be possible between varying and different hardware resources (like different generation of CPUs)				
571	22	Storage Migration	Must have the integrated ability to live migrate VM Data (VM Files) to a different storage, on as required basis, without causing any downtime or any disruption of services.				
572	23	Maintenance Mode	System must have the ability to place a host into maintenance or test mode, after automatically live migrating all VMs on to other available hosts, so that the defective host can be shut down.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
573	24	**Automated Load Sharing**	System must have the integrated capability to automatically load balance workload across hosts, whenever hardware constraints are observed (like CPU, Disk, Memory, Network IO, etc)				
574	25	**Power Management**	Hypervisor must have the capability to migrate VMs to fewer hosts and power-off unused hosts, and wake host systems back as and when required.				
575	26	**Storage Migration**	Must have the integrated ability to live migrate VM Data (VM Files) to a different storage, on as required basis, without causing any downtime or any disruption of services.				
576	27	**Cluster Size**	Maximum Hosts in a cluster - pool should be not less than 06 Hosts/500 VM per cluster				
577	28	**Integrated HA**	Hypervisor must have integrated High Availability feature to recover and restart VMs in case a host failure from a alternate Host automatically				
578	29	**Auto VM Reset**	Must have the capability to reset and restart VMs in case VM goes unresponsive or hangs, without changing host. But, in case of repeated hangs, the VM should automatically migrate to another host				
579	30	**VM Lockup Protection**	Virtual Machines must be able to run on a mirrored/lock-step relationship (Primary-Secondary) and switching over to the secondary VM in case of a host failure without loosing the state of the VM.				
580	31	**HA in Application & Service Level**	The offered system must have the capability to monitor VM health and restart, report and remedy when problems are detected				
581	32	**Max CPU - Host**	Should support upto 100 logical CPUs				
582	33	**vCPU Support**	Hypervisor must support upto 80 vCPUs				
583	34	**Storage Support**	Must support FCoE, NAS, SATA, iSCSI, SAS, SSD, Flash etc				
584	35	**Serial Port**	Hypervisor must support serial ports over VM				
585	36	**Hot Plug**	Must have the ability to add Virtual Machine components while VM is running				
586	37	**Memory Page Sharing**	Memory (RAM) savings through sharing identical memory pages across virtual machines (more effective when using similar OS instances/smaller page sizes)				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
587	38	**API & SDK**	Must have programming interface to integrate 3rd party products				
588	39	**File Sharing**	The built-in File System must have the ability for multiple host to access data concurrently during live migrations				
589	40	**Boot from USB**	Must have the capability to boot the Hypervisor from USB				
590	41	**Thin-Disk Provisioning**	Must have the ability to over-commit overall disk space by dynamically growing the size of virtual disks based on actual usage rather than pre-allocating full size.				
591	42	**Linked Images**	Hypervisor must have the ability to run multiple Virtual Servers off a single base image for quick cloning and/or space saving purposes using snapshot and/or streaming technologies provided with the virtualization software				
592	43	**Software Storage Replication**	The offered system must provide software based integrated Storage Replication				
593	44	**Caching**	Must have the ability to provide Read-Write Cache				
594	45	**NIC Teaming**	Must incorporate NIC fail-over and load balancing over virtual switch				
595	46	**Storage QoS**	The offered Hypervisor must have the ability to control Quality of Service for Storage I/O for Virtual Machines				
596	47	**Virtual VLAN**	Must have the ability to create virtual LAN segments in order to isolate network traffic on the same physical network (IEEE802.1q)				
597	48	**Private VLAN**	Must have support for private virtual local area networks (PVLAN) allowing to 'sub-partition' a VLAN by restricting switch ports to only communicate with a given 'uplink' - avoiding 'per-to per' communication				
598	49	**IPv6 Support**	Must support IPv6 for all traffic types				
599	50	**I/O Pass Thru**	Hypervisor should be able to maximize I/O performance (disk and network) by presenting I/O devices directly to VMs				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
600	51	**Jumbo Frame Support**	Must provide support to large Ethernet frames of more than 1500 bytes of payload				
601	52	**Network QoS**	Must have the capability to control Quality of Service for Network I/O of Virtual Machines				
602	53	**Traffic Monitoring**	Must have the capability to monitor network traffic over port mirroring				
603	54	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
604	55	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
605	**R**	**Technical Specifications for Virtual Desktop (VDI) Working**					
606	1	**VDI Application Type**	Implementation of Desktop VDI Solution for delivery of various customer applications. Every user shall be provided with their own customised desktops with optimised applications for his working				
607	2		Bare-metal, type-1 Virtualisation of on-premise servers using Host OS with necessary licenses from **Windows/Linux/VMWare** in HA configuration for hosting 80 concurrent Guest VMs. To be read in conjunction with the requirement highlighted at Serial "Q" above.				
608	3	**Licensing**	Only offers with One-time costs are been considered. Hence, OEM products with Recurring OPEX charges are NOT to be proposed. Accordingly include all licenses as applicable to the offer				
609	4	**Display Protocols**	Support for ICA/RDP and PC over IP with bandwidth support for 1080P or higher with 32 bit colour				
610	5	**VDI VMs**	The offered VDI solution must provide capability to run Hosted Virtual Desktops (HVD) with their VDI platform. It must essentially include components like connection servers/brokers to manage the client connectivity, remote protocol(s), deployment mechanisms and other VDI-specific optimizations.				
611	6	**Graphics Capability**	The VDI solution shall have graphics related capabilities for virtual desktops, hardware offload/redirection or other protocol capabilities like OpenGL, DirectX etc. Additional graphics card may be added on offered servers, on as required basis				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
612	7	**Software GPU**	The VDI must have the ability to emulate GPU capabilities with specialized virtual hardware and drivers in the Virtual Machine - without the use of a fully capable physical graphics adapter (GPU) in the host.				
613	8	**Shared GPU**	The offered VDI must have the ability to share physical graphics adapters (GPUs) in the host to achieve advanced graphics capabilities for multiple sessions/users.				
614	9	**Dedicated GPU**	The VDI must have the ability to dedicate a physical GPU to a heavy graphic user/VM (like MRI or CT Scan) to achieve maximum (native) graphics capabilities.				
615	10	**Endpoint Support**	The VDI must support wide variety of platforms other than Thin-Clients to run the client applications to connect to virtual desktops and applications				
616	11	**Storage Optimisation**	The offered solution must have integrated storage caching technologies to reduce IOPS requirements				
617	12	**Portal based Applications**	Solution offering anytime, anywhere, anyhow, any platform solutions will have higher preference. The offered VDI must have enterprise-class portal capabilities that give users a single point of access over Single-Sign-On for desktop and application services (VDI desktop, virtualized applications, SaaS delivered applications).				
618	13	**Application Management**	The offered VDI must have the ability to monitor and manage application running on the virtualized platform (performance, dependencies etc)				
619	14	**Orchestration of Workflows**	The offered VDI solution must have the tools to automate the manual tasks to automated workflow engines				
620	15		The vendor shall implement and configure industry standard directory services and solutions to manage the resources and users. Accordingly, link & Configure Directory services, AAA, DHCP, NTP etc with our UTM cum Firewall in order to centrally manage Remote Server services for domain and privileges assigned authentication functions.				
621	16		The vendor must implement directory services (preferably AD/DHCP) and print services (Print/mail). Configuration of all user Application groups and various User centric application publication as needed.				
622	17		The vendor shall provide an industry standard information security solution for authentication, authorization and access control, by implementing a system based on password.				
623	18		The vendor must implement and configure virtual machines to support the directory services				
624	19	**Customisation & Configuration**	The solution should help to manage login management, setup and removal of users and user accounts.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
625	20		The solution must enable the confidential communication channels which provide data integrity across user access points in the networks that are used to connect to the Integrated Data Center infrastructure.				
626	21		Create GUI based user-friendly user groups and accounts as needed under domain and define basis Domain wide group policies.				
627	22		Add various user-devices like workstations, Desktops, Laptops, iPad, Tablets, and Zero/Thin-clients to domain as needed				
628	23		Supply, Install and Configure Windows Server 2016/2012 R2 with 80 CALs and 80 RDP CALs for application delivery through VDI Desktops - on as required basis				
629	24		Supply, Install and Configure Open/Libre Office suite (MS Office equivalent) for office application delivery through VDI Desktops				
630	25	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
631	**S**	**Technical Specifications for Zero/Thin-Client**					
632	1	**OS**	OS based on offered solution. **Lock-down Embedded OS is preferred**. Windows or GUI enabled Linux; Alternately, Zero-clients with firmware and SoC tuned specifically for the offered VDI protocols (PCoIP, HDX, or RemoteFX), also acceptable				
633	2	**CPU**	Quad-Core AMD or Intel or above with Clock-speed of over 2.0GHz				
634	3	**Performance**	50 Mpps or better				
635	4	**Latency**	Less than 150 Ms @ full resolution or at 1080P				
636	5	**Interfaces**	Gigabit Ethernet, (Integrated g/n dual band Wi-Fi is also accepted), USB for Keyboard & Mouse				
637	6	**Memory**	2GB or more DDR3 RAM. (Zero-client offers may need only 1GB) and more than 8 GB Flash RAM				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
638	7	Protocol Support (Any)	Citrix ICA & HDX / Java / Microsoft RDP & RFX / VMware Horizon View through RDP & PCoIP / Teradici, with PPP, PPPoE, VPN support.				
639	8	Display	Single display: 1920 x 1200 @ 60Hz with 32 bit colour				
640	9	Display Interface	One DVI-I or HDMI port or VGA (DB-15) adapter				
641	10	Power	Auto-sensing 100-240 VAC, 50/60 Hz, RoHS Compliant. PoE power (Class-II) also acceptable				
642	11	Monitor	20" or more TFT/IPS/LED Screen				
643	12	Input Devices	104 Keys and a scroll Mouse				
644	13	Mounting Kit	Monitor mounting kit/stand				
645	14	Other Value-Added Features	List other value-added features, if any that are useful to the Buyer				
646	15	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
647	T	Technical Specifications for LTO6 (or later Gen) Tape Library					
648	1	Tape Drive	Offered tape Library shall be Modular with minimum of four (04) drives and to allow configuration, add capacity expansion to 12 drives and increase performance.				
649	2		Offered LTO6 drive in the Library shall conform to the Continuous and Data rate matching technique for higher reliability.				
650	3		Tape Drive Architecture in the Library shall conform to Ultra3 SCSI / iSCSI standards.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
651	4	Architecture	The Tape Library unit shall be configured with 4 LTO Gen6 Tape Drives.				
652	5		19" Rack mountable with rack mounting kits				
653	6		Tape Library shall provide remote monitoring capability, hot swap tape drives and power supplies.				
654	7	Cartridges to be Supplied	10 Nos. of LTO Gen 6 - Normal Mode 1.5TB Data Capacity and 3TB Compressed Capacity & 2 Cleaning Cartridges shall be provided from Day one				
655	8	Drive Technology	The device shall have dual FCoE interface support for LTO 6 or later with multi path I/O trunking and automatic load balancing for each server/partition/storage fully licensed and enabled.				
656	9	Native Data Capacity	Tape Library shall have Native data capacity of 120TB (uncompressed). Tape Library shall have a provision to go up to 200TB in native mode for future expansion				
657	10	Tape Options & Support	LTO 5 and LTO6 cartridges should be supported				
658	11	Connectors & Interfaces	At least two industry standard FCoE or SCSI ports. High speed serial connection, SAS and Fibre interface with LC connector is also preferred.				
659	12	Sliding Kit	Sliding Rack mounting kit is preferred				
660	13	Security	Offered LTO6 drive in the library shall offer WORM support and embedded AES 256 bit encryption.				
661	14	Speed	Offered LTO6 drive shall have native speed of over 160MB/sec and a compressed speed of over 380 MB/sec for 2.5:1 compression.				
662	15	Scalability	The Tape Library shall be scalable to support up to 12 or more tape drives.				
663	16		Expansion scope for Linear Tape-Open (LTO) Ultrium 8, 7 and 6 cartridges is preferred				
664	17		Tape Library shall support slot expansion of more than 80 slots.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
665	18		The Tape Library shall be quoted with at least 80 number of Cartridge slots.				
666	19	Partition Support	Tape Library shall support partitioning for the Mixed media usage, so that each configured drive can have own partition and allocated slots. Partitioning shall be carried out without using any external device outside of Library.				
667	20	Other Features	The Tape Library shall be capable to allow add or remove tape drives without schedule downtime.				
668	21		Tape Library should have GUI panel.				
669	22	Barcode Reader	Tape autoloader with barcode reader should be available				
670	23	Mail Ports	Tape Library shall be supplied with at-least 12 load or Mail ports. Library shall support at-least 30 load or mail ports for future expansion.				
671	24	Overall Management	Tape Library shall have web based secure management so that drives and robots can be assigned to clients on requests / Demand.				
672	25	System Redundancy	Shall have redundant and hot swappable PSU and Fans				
673	26	Compatibility	Tape library should be supported with the offered FCoE switch and Data Backup software by vendor. Integration between entire system of server, Storage, Data backup hardware and software, LAN switch and other network devices should be ensured by bidder for complete functionality of the item.				
674	27	Additional Capabilities & Features	Built-in auto tape loader, automatic calibration, automatic and manual drive cleaning etc to be supported from Day-1				
675	28	Allied Accessories	All the necessary tools & tackles licenses, cables/ connectors for Ethernet / Fibre / USB / Power and rack mounting kits etc. required for making the system operational shall be provided by the bidder.				
676	29	Other Value-Added Features	List other value-added features, if any that are useful to the Buyer				
677	U	Technical Specifications for Tape Backup Solution					

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
678	1	OS Support	The proposed Backup Solution should be available on various OS platforms such as Windows, Linux and UNIX platforms and be capable of supporting SAN based backup / restore from various platforms including TRU64 UNIX, HP-UX, Linux, Open VMS, NetWare and Windows.				
679	2	Backup Software	The tape backup device must be directly supported by any two of our approved OEM backup software packages. "Directly supported" means that the tape backup device model must be listed as a supported product on the software publisher's website or their published compatibility documentation.				
680	3	Backup over VM	If the following requirement can be fully met by the proposed Hypervisor software, including its licensing and feature aspects, the additional backup software is not required.				
681	4		If the solution involves a Server, a dedicated Backup Server, with licensed OS as per the specifications of the RFP as to be provided				
682	5		Proposed backup solution shall be offered with Cluster license of server.				
683	6		If the proposed Hypervisor has built-in real-time backup feature with near capabilities as discussed here, a separate backup software may be avoided.				
684	7		Proposed backup solution shall support industry leading cluster solution such as MSCS, MC Service Guard, Veritas Cluster etc.				
685	8		The offered solution must offer an ideal architecture for the off-site, off-host replication (with or without any external hardware/software). Any additional requirements, if any to be an essential component of the offer.				
686	9	General Requirements	The backup solution shall be deployed using Storage to 3rd party Storage system replication without impacting any Applications Server or Applications involvement.				
687	10		Proposed backup solution shall have same GUI across heterogeneous platform to ensure easy administration.				
688	11		The proposed Backup Solution should support tape Mirroring running concurrently with primary backup. e.g. With the primary volume Backup 4 additional tape copies can be created simultaneously without the need to duplicate 4 copies after the main backup. It should work as part of proposed backup software itself, not a separate hardware or software solution. It should work independent of tape emulation. Only additional licenses should be required without adding any other device or software.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
689	12		The proposed backup solution support de-multiplexing of data cartridge to another set of cartridge for selective set of data for faster restores operation to client/servers. However, in case of Disk-based backup solution must provide all the functionalities of tape backup, i.e., adding devices, sharing devices, job schedule, backup retention, writing multiple data to multiple devices for faster backup and restoration.				
690	13	License	Data replication software shall support synchronous and asynchronous replication. But, on the Day-1, licenses and capabilities for asynchronous replication only need to be enabled.				
691	14		The solution shall provide with the unlimited or at-least 100 licenses for Bare Metal restore for windows servers.				
692	15		Data system should be configured with synchronous and asynchronous replication software, but with total licenses for the asynchronous replication to the full capacity of the storage system.				
693	16		The proposed Backup Solution supports the capability to write up to 12 data streams to a single tape device or multiple tape devices in parallel from multiple clients to leverage the throughput of the Drives using Multiplexing technology.				
694	17		The proposed backup solution should allow creation of additional backup copies, run concurrently with primary backup, within the same Library or over the network to another tape library/standalone drive of different format medium (e.g. Ultrium to SDLT etc..) to allow easy valuating operation.				
695	18		The proposed backup solution should allow creating tape clone facility after the backup process.				
696	19		The proposed Backup Solution has in-built calendar based scheduling system and supports Clustering the Backup Server and Media Server on Windows and Unix/Linux.				
697	20		Backup solution shall be configured in such a fashion that no extra license for Client and media servers is required while moving from LAN to SAN based backup.				
698	21		The proposed backup solution shall be offered with unlimited client and Media (Both Cluster and standalone) for SAN based backup and LAN based backup. The Client licenses should be common for usage across heterogeneous computing environment.				
699	22		The solution on offer to be CPU independent, cross operating system client licensing to support windows/Linux/Unix operating systems for LAN-based as well as LAN-Free backup.				
700	23		The proposed Backup Solution Software has inbuilt Java / Web based GUI for centralized management of backup domain.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
701	24	Capabilities & Feature sets	Backup Software shall support encryption and all encryption keys shall be stored on to backup server for effective management. The system must be easily configurable for effective handshake with the offered Tape Library, over open standards and protocols.				
702	25		Backup software shall provide import and export facility of encryption keys for protection. The system must be easily configurable for effective handshake with the offered Tape Library,				
703	26		The proposed solution also supports advanced Disk staging.				
704	27		The proposed Backup Solution has in-built media management and supports cross platform Device & Media sharing in SAN environment. It provides a centralized scratched pool thus ensuring backups never fail for media.				
705	28		Backup Software shall support Synthetic backup so that Full backup can be constructed directly from the disk based incremental backups.				
706	29		Backup software shall also support disk based Incremental Forever or Virtual full backup whereas every incremental backup shall be equivalent to Full backup without actually copying the actual data blocks of previous full backup.				
707	30		Backup Software is able to rebuild the Backup Database/Catalogue from tapes in the event of catalogue loss/corruption.				
708	31		Backup to be possible without taking the disk system offline				
709	32		Backup software shall support scheduled automated restores to perform periodic restore drills.				
710	33		Backup Software shall offer Extensive reporting capabilities to monitor the health of Backups. It shall support scheduled automated generation of the report on a daily basis.				
711	34		The backup software must provide near real time monitoring and reporting of the backup environment. It should provide a graphical representation and monitoring of trends and current status. Software shall support event notification to notify backup administrator about events like Job Failed or Job aborted etc.				
712	35		The Software should have a capability to define Polices centrally based on Business requirements. E.g. What Data to be backed up, where to store the Data, Retention period & Number of versions.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
713	36		The backup software should have capability to configure automated backups with customized frequency based and scheduling based on the backup policy. In addition the software should also have capability for user-initiated backup. The Software should use the available media efficiently by writing the full and incremental data on to the same tape as long as the space is available on the tape media.				
714	37		The software should have capability to retrieve selectively based on search criteria. The backup software should also include full fledged Media Library Management, including complete an automated offsite tape management, creation of pickup and drop lists, tracking of tapes, etc				
715	38		The software should support for ever incremental backup & there should not be a need to do a Full backup again.				
716	39		The proposed Backup Software shall offer OPEN File Support for windows and Linux.				
717	40		The proposed Backup Solution has certified "Hot-Online" backup solution for all frontline Databases such as Oracle, Postgres SQL, MySQL etc				
718	41		Backup software shall also support Microsoft and VMware server & shall have integration with Microsoft Data Protection Manager.				
719	42		The solution must provide Automated Online and/or RMAN backup for Oracle database. It should provide Full, differential, and cumulative incremental backup while data is online with protection down to the data file level				
720	43		The solution should support point-and-click complete recovery and point-in-time recovery based on time, SCN and log sequence number. It should be able to restore read-only files when needed as well as flexible restoration of complete database, individual table spaces or individual data files should be available				
721	44		The Proposed backup solution shall provide granularity of single file restore.				
722	45		The Proposed backup solution shall be designed in such a fashion so that every client/server in a SAN can share the robotic.				
723	46		Backup Solution shall be able to copy data across firewall.				
724	47		Backup Solution shall support automatic skipping of backup during holidays.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
725	48		If the Backup solution requires additional hardware like backup server etc, the same is to be catered in the offered solution				
726	49	**Hypervisor Support**	Application can run as a VM from the proposed Hypervisor				
727	50	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
728	51	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
729	**V**	**Technical Specifications for Rack Server - (To be Configured on Active-Active)**					
730	1	**Rack Form Factor**	2U, 3U and 4U Rack formats acceptable				
731	2	**Physical CPU**	Dual (two socket) Intel Xeon Processor E5/E7 v4 or later gen (Family), having 16 or more Cores (32 of more threads), over 2.1GHz base frequency, Over 40MB L2/L3 Cache, 9.6 GT/s QPI of bus speed. The offered CPU shall support both Intel Virtualization Technology (VT-x), Intel Virtualization Technology for Directed I/O (VT-d) and Intel VT-x with Extended Page Tables (EPT) technologies. To decide which CPU on offer meets or has higher specs, the CPUs shall be benchmarked at: https://www.intel.com/content/www/us/en/products/compare-products.html/processors.				
732	3	**Memory**	4 x 32GB 2667MHz DDR4 ECC Registered DIMM Module				
733	4	**Storage using SSD (TLC) Drives**	8TB or more of useable space (after RAID 5) with Datacentre rated, 2.5", SFF, SSD, TLC, SATA3/SAS				
734	5	**NVMe/M2 Flash Boot**	1TB or more PCIe Storage for OS				
735	6	**RAID Controllers**	SATA/SAS RAID Controllers (Hardware RAID levels 0, 1, 5, 6, 10, 50, and 60), 4GB DDR4 Cache, 12GB/sec				
736	7	**Graphics**	Nvidia or ATI, or Matrox PCIe card with dedicated onboard memory of at least 4GB GDDR5 with bandwidth of over 80 GB/s				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
737	8	PCIe 3.0 Port Expansions	10GbE Dual-Port RJ45 Server Adapter				
738	9		4 (Quad) Port Gigabit Server LAN Adapter RJ45 10/100/1000				
739	10		10GbE Dual-Port SFP+ (Direct Attached) Server Adapter				
740	11	Power & Management	Redundant 900W Power Supplies, Remote Management LAN Port, Local Management USB etc				
741	12	OS Licenses	Microsoft Windows Server 2016 or later, Licensed for the offered Core and 02 Virtual Machines)				
742	13	Device CAL	Microsoft Windows Server 2016 or later - 5 Device/User CAL Pack for 80 Concurrent Users/Nodes				
743	14	VM Licenses	As per the requirements indicated at Serials Q & R				
744	15	Other Value-Added Features	List other value-added features, if any that are useful to the Buyer				
745	16	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, fans, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
746	W	Technical Specifications for Unified Network Storage					
747	1	Rack Form Factor	4U ~ 12U Rack mountable formats acceptable				
748	2	OS Support	The storage array should support industry-leading Operating System platforms including: all Windows Server Editions, HP Tru64 UNIX, OpenVMS, Sun Solaris, All Linux Server Flavours, IBM-AIX, etc				
749	3	Hypervisor Support	The proposed storage array must support integration with different Hypervisors and also provide the required software plugins to integrate with the Hypervisor (VMware/Citrix/Microsoft/Linux).				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
750	4	Disk Preference	Solutions proposed should be using SATA/SAS, SSD and Flash (Only QLC - 4bit Quad Level Cell, SLC NAND are accepted) disk, as specified in our tiered storage needs. However, Flash solutions using simple MLC technologies are not acceptable.				
751	5	HA & RAS	The storage array should support multiple High Availability clusters of various operating systems mentioned above				
752	6		Non-disruptive component replacement/upgrade of interfaces, disk controllers, disk drives, power supply & battery systems, cooling fans and microcode updates.				
753	7		There shall be redundant power supplies with provision for connecting to power inputs from different sources.				
754	8		Shall have redundant cooling fans.				
755	9		Recovery from unscheduled power failure / interruption without any data loss irrespective of the number or frequency of outages				
756	10		Pro-active maintenance, self monitoring, self diagnosing and wherever possible, self repairing features wherever possible.				
757	11		The Storage System(s) shall have no single point of failures across all components in the subsystem, such as Non-disruptive component replacement and non-disruptive replacement of Interfaces, Disk controllers, Disk drives, Cache memory cards, Micro-code, Power supplies, Battery systems, Fan sub systems, FC controller Cache, Cache boards, Front-end Boards, Backend Boards and ports, etc.				
758	12	Connectivity Ports & Tiered Storage Needs	**Tier-I (High Performance Storage)**. 4 x iSCSI/FCoE port based High performance purpose built Flash/NVMe array with minimum scalability support for 12 TB. To be populated with 4 TB of usable space post RAID-5 for Day-1 needs.				
759	13		**Tier-II (Mid-Level Performance Storage)**. The storage array shall support 4 x 1 Gbps Ethernet ports and 4 x 10Gbps iSCSI/FCoE ports. Solid Disk Drives (SDD) Drives are preferred over mechanical drives.				
760	14		**Tier-III (NAS-Level Performance Storage)**. NAS storage array should support 4 x 1 Gbps Ethernet ports and 4 x 10Gbps iSCSI/FCoE ports. Solid Disk Drives (SDD) Drives are preferred over mechanical drives. Tier-III is optional for those bidders, providing Video Surveillance storage, as part of IP Video Surveillance solutions.				
761	15		Alternately, Single Array that support multiple tiers and data Tiering features and allow configurable data movements across tiers or storage as different pools for each Tier is also permitted.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
762	16		As an alternate to independent connectivity options, array with 12 or more 10G Ethernet Ports across controllers, Ethernet ports with full support both Block (iSCSI) and File (NFS, CIFS) protocols simultaneously, are also acceptable.				
763	17	Day-1 & Capacity Scalability Requirements	The storage array shall be based on Unified Storage optimized hardware architecture with or without traditional SAS/FC/iSCSI backend connectivity.				
764	18		Each of the proposed Unified tier array shall be offered with minimum 01TB Cache Read/Write. Alternately, soarge arrays that can be configured with 1TB of SSD Cache is also acceptable.				
765	19		**Tier-I**: 08TB of usable SSD storage space with minimum of 25% additional capacity for over-provisioning for handling wear-levelling and garbage collection flash processes. The proposed Tier-1 storage shall be scalable upto 12TB for future expansion				
766	20		**Tier-II**: 12TB usable space in RAID5 using 15K RPM SAS disk drives. This tier storage shall provide 20% of drive configured in each category as hot-spares. The proposed storage array should be scalable upto 20TB of disks for future expansion				
767	21		**Tier-III**: 250TB usable space in RAID6 using Enterprise class NL-SAS 7.2 K rpm drives. This tier storage shall provide 20% of drive configured in each category as hot-spares. The proposed NAS storage array should be scalable upto 400TB for future expansion. Please note that, Tier-III is optional for those bidders, providing Video Surveillance storage, as part of IP Video Surveillance solutions.				
768	22	Form Factor	The entire storage solution shall be rack mountable and should not exceed 12U rack size.				
769	23	Processors	System offered shall have independent processing power for each front and backend ports by RISC/MIPS/ASIC/FPGA based processors.				
770	24	Controller Requirements	The offered Storage system shall be scalable to the size indicated using the same ratio of drives without adding any additional controllers. If additional controllers are required, the requisite numbers of controllers are to be provided on Day 1.				
771	25		The entire solution should have the requisite license to instant, online and consistent point-in-time images. The storage support creation of minimum 80 snapshots/point-in-time images and clones per volume/LUN. The license proposed should be based on 20% of usable Flash capacity on day-1 requirement.				
772	26		The point-in-time copies of the production volume should not increase the performance overhead.				
773	27	Licensing	The proposed solution should ensure active-active controllers with redundancy in its architecture with NSPOF (no single point of failure)				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
774	28		The storage controllers should be operating as Active/Active				
775	29		The proposed storage solution should have capability to support inline data compression or deduplication				
776	30		The storage should have support for replication and all necessary licenses to achieve the Disaster Recovery should be provided.				
777	31	**Power Consumption**	The combined Day-1 power requirement should not exceed 2000 Watts				
778	32	**System Upgrading & Patching**	The proposed Disk based array should be field upgradable and also to the next family through data-in-place upgrades without fork-lift upgrades and without requiring replacement of the disk shelves and without any data migration.				
779	33	**LUN Movement & Management**	The solution shall ensure movement of entire volume/LUN as a whole non-disruptively between the nodes or between different tiers of disks to optimize the system for capacity utilization and performance. This feature shall also be used for seamless hardware upgrades i.e., there should be no downtime for the Server / Host / User during this movement of entire LUN / Volume.				
780	34		The storage shall have the ability to combine multiple RAID groups in to a single entity so as to create LUNs using Multiple RAID groups and hence form the single entity to give maximum performance.				
781	35		The storage should support wide striping of data across all RAID groups for performance. Any additional hardware or software must be proposed for wide striping of data across all available RAID groups.				
782	36		Allocating and revoking disk space, Creating RAID groups and logical units, Auto tiering, LUN binding and masking license for at least 08 servers, Volume Striping across at least 12 disks at the storage controller level, Dynamic Volume Expansion				
783	37	**Thin Provisioning**	Ability to view and allocate more storage capacity than has been physically reserved on the storage array				
784	38	**Unified Storage Architecture**	The proposed storage solution must be with an arrangement that can flexibly support all popular storage environments, including virtual desktop requirements, Video Surveillance, eLibrary, client storage allocation etc and hence will have a protocol mix of FC, iSCSI, NFS/CIFS and IP SAN etc.				
785	39	**Data Security**	Storage subsystem shall be offered with encryption facility for actual data which is going to reside on the storage. Encryption for actual data shall be managed within the storage array (preferred). Alternately encryption software at switch or server environment with the same functionality is also acceptable.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
786	40	System Cache	The storage array shall have required mechanism to ensure optimal protection of data in cache during power outage or sudden shutdown. The data in cache shall not be lost in case of power failure.				
787	41		Storage array shall have either Cache Duplexing or Disk de-staging support to avoid any kind of data loss.				
788	42		On unplanned power outage the data placed in Cache should be retained indefinitely till the situation is brought back to normal.				
789	43	General Requirements	Storage system shall support Full Volume Copy implementation of primary usable data. It should also have option to support space efficient snapshots				
790	44		The Storage system should have storage management utilities that help in administering the storage. A single storage management console should be used for all storage management related activities. It should support the following:-				
791	45		· Ability to collect, store and analyse storage performance data.				
792	46		· Ability to monitor the status, performance and configuration with utilization.				
793	47		· A centralized extensive monitoring, configuration and management of storage components and its connectivity components via a single console.				
794	48		Should have the flexibility to allow the users to set up, enable, delete and remove remote copy volumes, repairs and internal hardware copy volumes.				
795	49	I/O Failover	The I/O paths from the servers to storage system shall be load balanced.				
796	50		The Storage system should be configured with Load Balancing & Auto Failover software. The design shall enable automatic rerouting of I/O traffic from the host in case of primary path failure.				
797	51		The Storage System shall be guaranteed to be fully compatible for IO Adapters, clustering solution and OS offered with the Servers. The storage system shall be seen by software as standard disks.				
798	52		The storage system should support data replication from One storage system to another storage system without any server intervention				
799	53		The storage system should support Pro-active maintenance–self monitoring, self-diagnosing and wherever possible, self-repairing features				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
800	54	Feature Support	The storage system should support automatic detection of errors, error logging and notification.				
801	55		The storage system shall provide thin provisioning support which allows creating the volumes of bigger size than available capacity. Alternate architecture with LUN/ Volume expansion or Shrink is also acceptable.				
802	56		Storage system should have a support of virtualization engine which can allow consolidation of third party fabric based storage system as a Single array without using any client software or dedicated appliance for Production systems. Equivalent capabilities also acceptable				
803	57		The Storage system should be configured with GUI-based Storage Management Software Tools for Management. A single command console should be used for the entire storage system. In case an enterprise version of the Storage Array specific Storage Management Tool exists, then the same should be proposed.				
804	58		The Storage system should support online (hot) replacement of failed disks without interruption, shut-down or rebooting the server				
805	59	IOPS Requirements	The proposed unified storage solution should be capable to deliver 30,000 IOPS in mix load environment with microsecond latency below 1ms. The solution proposed must be capable of the proving its performance credentials. The Contractor has to demonstrate the IOPS performance using Intel IOMeter during testing and project acceptance phase				
806	60		In addition to benchmarks reports and documentations detailing demonstrated performance of the proposed storage solution, the bidders shall provide road-map to grow IOPS performance with and without change to the proposed operating environment.				
807	61	Data BW	Storage array shall have aggregate scalable data bandwidth of 64Gb/sec or more.				
808	62	Management Utility	The Web based GUI should provide details of performance of different components of the array such as Storage pool, LUNs, Ports. The dashboard should be able to show performance in IOPS, Bandwidth & Latency in real time. The proposed solution should be capable to get storage performance history for more than week.				
809	63		The GUI must be able to show overall health statistics of the array such as capacity utilization, temperature, status of the different modules in the array.				
810	64	Primary and Secondary Storage Connectivity	The proposed storage should support NDMP protocol for data backup				
811	65	Other Value-Added Features	List other value-added features, if any that are useful to the Buyer				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
812	66	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, fans, brackets, rack mounting kits, power cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
813	X	Technical Specifications for IP Video Surveillance Camera Type-1					
814	1	Form Factor	Dome				
815	2	Minimum Resolution	1080P (Full HD) or 2 Megapixel				
816	3	Site Environment	Indoor; Vandal Proof Required				
817	4	Sensor Type & Size	Progressive Scan, CMOS. Sensor shall be either 1/2.8" or larger				
818	5	Light Sensitivity & Minimum Light	Colour: 0.1 lux at F1.4 (30 IRE, 2400 K); B/W: 0 lux at F1.4 (IR LED on)				
819	6	IR Sensitivity & Switching	850 nm; IR Cut Filter based switching; Shall also configurable				
820	7	Minimum IR Range	30 Meters				
821	8	Shutter Speed	Electronic; 1/5-1/2000 second (manual); 1/5-1/10000 second (auto)				
822	9	S/N Ratio	52 dB or more				
823	10	Vari-focal Lens. Focal Length	Vari-focal, f2.8-12mm; Horizontal & Vertical viewing angles to be configurable				
824	11	Aperture	F1.4				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
825	12	Viewing Angle Adjustments	Pan: 0°-350°, Tilt: 17°-163°, Rotation: 0°-350°				
826	13	Compression	H.264 (Baseline/ Main/ High profile), MJPEG				
827	14	Maximum Frame Rate vs. Resolution	30 fps at 1920 x 1080 30 fps at 800 x 600 15 fps at 320 x 240				
828	15	Video Streams	Minimum of dual streams simultaneous based on two configurations at varying bit streams configurable between 28Kbps - 6Mbps (per stream)				
829	16	WDR	75 dB or more				
830	17	Digital Noise Reduction	Yes; required; 2D + 3D DNR preferred				
831	18	Network Protocols Supported	IPv4/v6, TCP, UDP, DHCP, PPPoE, HTTP, HTTPS, DNS, DDNS, NTP, RTP, RTSP, RTCP, SMTP, FTP, IGMP, ICMP, ARP, Bonjour, UPnP, QoS, SNMP, IEEE 802.1X				
832	19	IP Security	IP address filtering, HTTPS encryption, Password protected user level, Anonymous login, IEEE 802.1X network access control				
833	20	Event Trigger	Video motion detection (3 regions), External device through digital input, Sound detection (when connected to Mic)				
834	21	Network Port	One PoE Class 2 (IEEE802.3af) Port for Video, Data & Controls				
835	22	Site Mounting Requirements	Surface, Gang Box, Flush, Wall Mount, Corner Mount - as per site requirements to be provided				
836	23	Onboard Storage	Both MicroSDHC, MicroSDXC memory card support				
837	24	NO/NC	One Digital In & Out				
838	25	Other Value-Added Features	List other value-added features, if any that are useful to the Buyer				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
839	26	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, brackets, mounting kits, patch cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
840	Y	Technical Specifications for IP Video Surveillance Camera Type-2					
841	1	Form Factor	Fisheye Dome				
842	2	Minimum Resolution	5 Megapixel or more				
843	3	Site Environment	Indoor; Vandal Proof Required				
844	4	Sensor Type & Size	Progressive Scan, CMOS. Sensor shall be either 1/1.8" or larger				
845	5	Light Sensitivity & Minimum Light	Colour: 0.1 lux at F2.6 (30 IRE , 2400 K); B/W: 0.05 lux at F2.6 (30 IRE, 2400 K)				
846	6	IR Sensitivity & Switching	700-1100nm; Onboard IR is preferred				
847	7	Shutter Speed	1/5-1/2000 second (manual mode); 1/5-1/10000 second (auto mode)				
848	8	S/N Ratio	56 dB or more				
849	9	Focal Length	Fixed focal, f1.3mm				
850	10	Aperture	F2.6 ~ F2.8				
851	11	Fisheye Viewing Angles	180° (overview area) 125° (high detail area)				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
852	12	**Compression**	H.264 (Baseline/ Main/ High profile), MJPEG				
853	13	**Maximum Frame Rate vs. Resolution**	(Dewarped View) 12 fps at 2592 x 1944 12 fps at 2048 x 1536 12 fps at 1920 x 1080 12 fps at 1280 x 720 12 fps at 640 x 480 12 fps at 320 x 240 (PTZ View) 12 fps at 1920 x 1080 12 fps at 1280 x 720 12 fps at 640 x 480 12 fps at 320 x 240				
854	14	**Video Streams**	Minimum of dual streams simultaneous based on two configurations at varying bit streams configurable between 28Kbps - 6Mbps (per stream)				
855	15	**WDR**	80 dB or more				
856	16	**Digital Noise Reduction**	2D + 3D DNR				
857	17	**Network Protocols Supported**	IPv4/v6, TCP, UDP, DHCP, PPPoE, HTTP, HTTPS, DNS, DDNS, NTP, RTP, RTSP, RTCP, SMTP, FTP, IGMP, ICMP, ARP, Bonjour, UPnP, QoS, SNMP, IEEE 802.1X				
858	18	**IP Security**	IP address filtering, HTTPS encryption, Password protected user level, Anonymous login, IEEE 802.1X network access control				
859	19	**Event Trigger**	Video motion detection (3 regions), External device through digital input, Sound detection (when connected to Mic)				
860	20	**Network Port**	One PoE Class 3 (IEEE802.3af) Port for Video, Data & Controls				
861	21	**NO/NC**	At least One Digital In & Out				
862	22	**Site Mounting Requirements**	Surface, Gang Box, Flush, Wall Mount, Corner Mount - as per site requirements to be provided				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
863	23	**Onboard Storage**	Both MicroSDHC, MicroSDXC memory card support				
864	24	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
865	25	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, mounting kits, patch cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
866	**Z**	**Technical Specifications for IP Video Surveillance Camera Type-3**					
867	1	**Form Factor**	Bullet/Dome				
868	2	**Minimum Resolution**	5 Megapixel or more				
869	3	**Site Environment**	Outdoor rated to IP66 and Vandal Proof rated to IK10				
870	4	**Sensor Type & Size**	Progressive Scan, CMOS. Sensor shall be either 1/3" or larger				
871	5	**Light Sensitivity & Minimum Light**	Colour: 0.1 lux at F1.8 (30 IRE, 2400 K); B/W: 0 lux at F1.8 (IR LED on)				
872	6	**IR Sensitivity & Switching**	850 nm; IR Cut Filter based switching; Shall also configurable				
873	7	**Minimum IR Range**	30 Meters				
874	8	**Shutter Speed**	Electronic; 1/5-1/64000 second (manual mode, 60 Hz); 1/5-1/64000 second (auto mode, 60 Hz)				
875	9	**S/N Ratio**	52 dB or more				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
876	10	Vari-focal Lens. Focal Length	Fixed focal, f2.1mm. Vari-focal, f2.8-12mm, also acceptable				
877	11	Aperture	F1.8				
878	12	Horizontal Viewing Angle	Over 100 Deg				
879	13	Compression	H.264 (Baseline/ Main/ High profile), MJPEG				
880	14	Maximum Frame Rate vs. Resolution	30 fps at 2592 x 1944 30 fps at 2048 x 1536 30 fps at 1920 x 1080 30 fps at 1280 x 720 30 fps at 320 x 240				
881	15	Video Streams	Minimum of triple streams simultaneous based on two configurations at varying bit streams configurable between 128Kbps - 20Mbps (per stream)				
882	16	WDR	70 dB or more				
883	17	Digital Noise Reduction	Yes; 2D + 3D DNR required				
884	18	Network Protocols Supported	IPv4/v6, TCP, UDP, DHCP, PPPoE, HTTP, HTTPS, DNS, DDNS, NTP, RTP, RTSP, RTCP, SMTP, FTP, IGMP, ICMP, ARP, Bonjour, UPnP, QoS, SNMP, IEEE 802.1X				
885	19	IP Security	IP address filtering, HTTPS encryption, Password protected user level, Anonymous login, IEEE 802.1X network access control				
886	20	Event Trigger	Video motion detection (3 regions), External device through digital input, Sound detection (when connected to Mic)				
887	21	Network Port	One PoE Class 3 (IEEE802.3af) Port for Video, Data & Controls				
888	22	NO/NC	At least One Digital In & Out				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
889	23	**Site Mounting Requirements**	Surface, Gang Box, Flush, Wall Mount, Corner, Pole, Pendant Mount - as per site requirements to be provided				
890	24	**Onboard Storage**	Both MicroSDHC, MicroSDXC memory card support				
891	25	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
892	26	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, mounting kits, patch cords, connectors, cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
893	**AA**	**Technical Specifications for Network Video Recording Software / Storage Hardware**					
894	1	**Form Factor**	Hardware device shall be Rack mountable with its supplied kits and rails				
895	2	**VMS or NVR**	Both VMS and Hardware NVR device acceptable. Solutions offering VMS solution must fully comply to the Tier-III technical specifications mentioned at serial "W" above				
896	3	**Recording Storage Capacity**	Storage to be configured for 250TB usable space in RAID6 using Enterprise or Datacentre rated SATA drives for the Day-1 requirement. This tier storage shall provide 20% of drive configured in each category as hot-spares. The proposed NAS storage array should be scalable upto 400TB of SATA disks for future expansion. Please note that, Tier-III is optional for those bidders, providing Video Surveillance storage, as part of IP Video Surveillance solutions.				
897	4	**Network Ports**	Hardware device shall have at least two 10G or four 1G network interface ports				
898	5	**CPU**	Intel Xeon E5-2620 v4 or higher rated CPU as per comparison at https://www.cpubenchmark.net/				
899	6	**Memory**	32GB, DDR4, 2400MT/s (24 DIMM slots, maximum up to 768GB)				
900	7	**OS**	With full professional or enterprise license as recommended by the OEM				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
901	8	**Recording Throughput support**	Offered system must support the required recording throughput of 960 Mbps or more				
902	9	**Licenses**	Offered NVR/NVRs shall support streams from 200 project cameras at its full resolution and frame rates. Hence, the offer must be loaded with 200 camera Base and 180 per camera licenses for full features demanded in our camera tech specs				
903	10	**Capacity**	The offered system must support 180 cameras on Day-1 with scalability for 200 cameras				
904	11	**3rd Party Devices**	Offered solution shall support more than 40 camera trigger thru Access Control and Network I/O devices interface. Necessary licenses, if any to be loaded accordingly				
905	12	**Number of Clients Supported**	Local: 1, Remote: 5				
906	13	**Event Status**	Display event status upon alarm or upon connection loss or recovery between server and client or when the allocated disk space is full				
907	14	**Map Support**	Electronic map support for local layout and google maps. Area maps with camera icons, small live view windows, hyperlinked				
908	15		e-Map image upload, Google maps settings and pre-set management, camera positioning, vision angle and pointed direction of camera, view positioning, source positioning, Access Control, Network I/O etc				
909	16	**E-PTZ and Fisheye Dewarp Support**	Mouse PTZ mode to control e-Map video streams. Fisheye Dewarping of all project cameras is a Must				
910	17	**Compression**	**H.265**, H.264, MPEG-4, MJPEG				
911	18	**Network Protocols Supported**	IPv4/v6, TCP, UDP, DHCP Client, HTTP, DNS, NTP, RTP, RTSP, SMTP, FTP, ICMP, ARP, UPnP, iSCSi, LDAP (client)				
912	19	**Synchronized Playback**	Support for at least 64 Cameras				
913	20	**FIFO Support**	The VMS to ensure auto deletion of aging/old files in FIFO basis or its archival based on the user settings to ensure there is no storage overload. The VMS Storage Manager to ensure that the HDD write speed is never slows down due to extra usage of allotted disk capacity.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
914	21	**Recording Search**	Search video recordings by time, events, channels, bookmarks, notifications and listed as clickable time-based thumbnails for full-size view and snapshot download				
915	22	**Search**	Search of recorded video by Motion Detection and Tamper. Hence, necessary analytics licenses for motion and tamper detection must be supplied.				
916	23	**Event Trigger**	Disk full, Disk not found, Disk is available, Schedule service start and stop, Video Push start and stop, CPU limit exceeded. Video motion detection, Passive IR sensor, External device through digital input, Sound detection, Intelligent event detection, Video Push start and stop, Video loss, Video Recovery, Network loss and recovery. Network I/O status, Access Control status etc				
917	24	**Event Response**	Pop-up window with live video and event confirmation activation, Switch to hotspot window, Switch to customize view, Command a PTZ device to go to a pre-set point, Play alert sound, Activate external device through digital output, Execute system command to activate other programs, Upload video or snapshot to FTP server, E-mail notification with snapshots, Push notification				
918	25	**CMS Features**	Support all project cameras in all resolutions and framerates in Map background. If additional licenses required, it must be factored by the bidders				
919	26	**Video Display Layout**	1, 3, 4, 5, 6, 8, 9, 10, 12, 16, 18, 24, 25, 35, 36, 48, 49, 64, and Custom, in single or multiple LED displays				
920	27	**Local Client Hardware**	HP, Dell, Asus, Wipro, PC with I7-8700K CPU, 16G RAM, GTX 1050Ti Graphic card, Keyboard, Joy stick, Mouse (all USB), 20" or larger display				
921	28	**Display Wall**	Two x 65" professional display (24x7) panel (from LG, Samsung, Sony or Panasonic) with VESA wall mounts, allied cables and connectors				
922	29	**USB Joystick**	As a operator support, as part of the system shall be supplied with a USB based PTZ control with a dedicated joystick control, supporting Pan, Tilt, Zoom, Iris, Focus of Fisheye lens project cameras.				
923	30	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
924	31	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, mounting kits, patch cords, connectors, video cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
925	**BB**	**Technical Specifications for KVM over IP Switch - 16 Port**					

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
926	1	Digital IP KVM Compatibility	Should provision for a single console to monitor multiple enclosures, over network irrespective of distance. Shall be used to manage the Blade and Rack servers.				
927	2	Functional Needs	To monitor and control up to 16 IP devices anywhere, over IP from a single KVM (Keyboard, Video, Mouse) console				
928	3		Must be a Rack mountable KVM over IP Switch with all its allied accessories including OSD & Cables				
929	4	Simultaneous Sessions	16 server ports, 2 remote users, 1 local port for use at the rack				
930	5	Form Factor	1U or 2U, rack mountable (brackets to be included)				
931	6	Network Connection	Dual 10/100/1000 gigabit Ethernet access				
932	7	Protocols	TCP/IP, HTTP, HTTPS, UDP, RADIUS, SNTP, DHCP, PAP, CHAP, LDAP, SNMP v2 and v3				
933	8	Cables & Connectors	2-Meter Single Link, Combo cable with VGA/HDMI/DVI(F), USB(F), 1 USB front, 2 USB rear, RJ45				
934	9	Supported Video Resolutions	640x480, 800x600, 1024x768, 1280x1024, 1440x900, 1680x1050, 1600x1200, 1920x1080, 1920x1200				
935	10	Multiplatform support	Windows, Linux and Mac				
936	11	Security over IP	Secure keyboard/mouse/video transmission via RC4 128-bit encryption				
937	12		Supports SSL 128-bit data encryption and RSA 1024-bit certificates for secure user logins from a browser				
938	13		Two level password security (administrator and users) - up to 64 user accounts with separate profiles for each				
939	14		Third party authentication supported: RADIUS, LDAP, LDAPS, MS Active Directory				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
940	15		Supports IP and MAC filters				
941	16		Log in authentication required for both local and remote access				
942	17	VDI Support	Message board allows logged in users to communicate with each other and allows a user to take exclusive control of the KVM functions				
943	18	Other Value-Added Features	List other value-added features, if any that are useful to the Buyer				
944	19	Allied Accessories	To be supplied alongwith all allied accessories (like power supplies, brackets, mounting kits, patch cords, connectors, video cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
945	CC	Technical Specifications for Access Control & Attendance Management System					
946	1	Cabling	Unlike other IP systems, the Contractor is expected to undertake the end-to-end concealed cabling based on the proposed OEM instructions, on as and where basis. For cable concealment, he is required to use only white, ISI/BIS rated PVC conduits from the list of approved vendors.				
947	2	Software	Open Standards based 64 bit Access Control Software (ACS) with licensed and integrated modules for Time-Attendance, Leave Management and Duty-Roaster Management upto 800 users. 3rd Party add-on modules and proprietary software are not acceptable. System shall have capability for Centralized Monitoring and Control, User-wise Access Rights, User, Zone and Time based Access Control, Input and Output Port Linking, Integration with Fire Alarm Panel, Surveillance System etc.				
948	3	ACS Controller	Both PoE based or external power supply with built-in 2 hours backup is acceptable. Controller must have direct RJ-45 based LAN support for communication with its readers and associated software.				
949	4		The per floor-wise ACS requirement could vary from 3 to 8 double leaf doors. Hence, the contractor can offer single or multiple door controllers				
950	5		Integrated Controllers with built-in readers and input/output ports may do away with the additional requirement for camera and door integration, as per site requirements.				
951	6		Each Controller shall have over 1MB RAM module to accommodate 50,000 or more event buffers from over 9000 fingerprints. It shall be minimum IP-65 rated against dust, dirt and water				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
952	7	**Readers**	Provide surface mounting style 13.56 MHz contactless smart card + Fingerprint readers suitable for minimal space mounting configurations. The Bio-Finger Print sensor shall be capable of 500 DPI or more resolution. STQC certified Sensor is Preferred. Each reader shall support at least three Finger Templates (Bio) registration, for such 800 users and 1000 user proximity card. Contactless smart card readers shall comply with ISO 15693 and shall read credentials that comply with these standards. Each reader shall provide authentication by reading the Card ID or Bio credentials and thru the controller will compare with database and actuating the door locks / barriers. Shall use 64-bit authentication keys to reduce the risk of compromised data or duplicate cards. The contactless smart card reader and cards shall require matching keys in order to function together. All RF data transmission between the card and the reader shall be encrypted, using a secure algorithm. Reader should have a tri-colour light emitting diode (LED) and audible annunciators. On integration, each reader shall control/activate door relays, RTE switches and IP Cameras apart from local and remote sounder activation thru door contacts. It shall be minimum IP-65 rated against dust, dirt and water				
953	8	**Door Locks**	Each door lock will be supplemented with door contacts wired to local and remote (ICT cum security room) sounders with NONC. Approved locking technologies include EM Shear lock / Electric Strike with minimum holding force of over 600N. May use necessary brackets nd spacers on as per requirements at site. It shall be minimum IP-65 rated against dust, dirt and water				
954	9	**Duress Alarm**	The system shall provide a feature whereby a cardholder, when forced to open a door under duress, shall be able to send a high priority alarm up to the operator at ICT Room, in order to alert security of the fact. For the cardholder's safety, the raising of this alarm must not have any obvious effect at the door concerned. The alarm should not be evident at the card reader. The access checks normally executed by the system (e.g. Person is authorized for that door, at that time and that day of the week), shall still be enforced for a duress access event. It shall be minimum IP-65 rated against dust, dirt and water				
955	10	**Other Accessories**	Other ACS project accessories to include the RTE switches, door contacts, wiring/cabling as per OEM instructions and the overall configuration of project software as per the customer requirements.				
956	11	**Management Software**	A server based management utility software for 500 users database, and two admins/supervisors also to be supplied for controlling various configurational aspects of associated software like, ACS cum Time-Attendance management, Leave Management and Duty-Roaster Management etc to be provided. This software shall have Attendance Records Storage of over Ten Lakh events.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
957	12	**Anti-Tailgating**	The family of products shall be capable of invoking the Relay Timer and Alarm Shunt timer to be cancelled 100 ms after the Door Monitor input senses that the door is closed.				
958	13	**Anti-Pass back**	**Anti-Pass back** modes shall include hard (no forgiveness) & soft (allow access but generates as alarm event).				
959	14	**Multiple Card Access**	The access control management must provide the possibility to allow access to an entrance/door only when at least two authorized cardholders swipe their badges. The number of cardholders for that kind of access check in front of an entrance shall not be limited by the system. Allow operator to enter a response to a particular device from device overview feature to an event when acknowledging it from the alarm view window. Alarm could be acknowledged, but auto response should be able to be configured for defined cases				
960	15	**HR Integration**	The associated project software like ACS cum Time-Attendance management, Leave Management and Duty-Roaster Management etc shall remain connected to our RFID Attendance cum HR Server over our campus LAN. The offered device shall have the memory of over 80,000 transactions, in case a failure of LAN network - thus ensuring the Attendance data is secure within the Readers. As soon as network with Attendance server is established, Attendance server shall read the data, synch itself & updates the database.				
961	16	**Request-To-Exit Device (RTE)**	Provide a hand operated Request to Exit (RTE) device at each ACS door. Activating the device shall release a magnetic door lock and send a request to exit signal through a relay output. The release of a magnetic door lock shall be facilitated by breaking DC power within the door controller. The relay may be DPDT, rated 1 amp at 24VDC. Alternately, exit motion sensor which employs Passive Infrared (PIR) technology to initiate door release also acceptable. However, such device shall have an adjustable detector face to allow for precise pattern configuration and adjustment.				
962	17	**Door Monitor Switch**	Provide ¾ inch diameter recessed door switch set for door monitoring.				
963	18	**Local Piezo Sounder**	Provide electronic piezo sounder at all ACS enabled doors. Sounder shall be 3 to 28 VDC and provide sound power output of 93dBA at 1 meter. Sounder shall be installed within a flush two-gang outlet box along with key switch to silence sounder. Provide stainless steel cover plate and mount each device in ½ inch diameter knockout. Provide key switch to silence piezo sounder. This key switch shall be installed within a flush two-gang outlet box along with sounder. Coordinate the site specific key requirements with our security consultant or PMC.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
964	19	**Photo ID cum Smart Cards**	• Approved Materials: PVC, PET, or PETG • Card Read/Write Speed - 100 kbit/s or more • Operating Distance - up to 100 mm • RF Type - Near field RF (Passive RFID) • Transaction Time - Typical ticketing <100ms (incl. backup management) • Operating Frequency - 13.56 MHz • Operating Protocol & Standards - ISO 14443-A&B, ISO/IEC 15693-2 and 18000-3 • Onboard Memory – 2K or more • Surface: Matte • Size: 85x54x0.80mm + 0.04/-mm. Samples to be submitted for our approvals • Printing: Laser burn thru • Serial number printing with embossing • Provide space for User Signature panels • Laser filming • Hot-stamping • Hole punching for lanyards Provide Lanyard + Card Holder & Template Card Printing				
965	20	**API & SDK for Integration**	To be supplied in English				
966	21	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, brackets, mounting kits, patch cords, connectors, video cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
967	22	**Essential Accessories**	Wall mounting base, Power adaptor, all necessary sheathed cables, brackets, software, SDK/API, all necessary Licenses				
968	**DD**	**Technical Specifications for Signage, OTT & IPTV Distribution Components**					
969	1	**Characteristics & Requirements**	The proposed IPTV cum OTT platform has following essential characteristics: • Stream various OTT services over LAN without buffering • 36~48 DVB channels, apart from FTA – just in case of Internet disruption • Digital Signage - Centrally managed Signage cum Content Management and Delivery System • GUI based EPG and all its associated licenses				
970	2		Installing and maintaining the headend infrastructure for DVB, CDN and Internet Bandwidth based IPTV streaming services within the local area network (LAN) at the client site. The proposed solution shall address following requirements broadly:				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
971	3	Overview of Requirements	Provide various IP services like Patent Information, Hospital information, Digital Signage, IPTV etc over a Single CAT-6 Cable. Incoming Feeds could vary depending on 36~48 DVB channels (FTA, HD, SD), OTT over broadband/Internet				
972	4		Ethernet based LAN network existing for the delivery of IP based services such as IPTV, Broadband Internet, Digital Signage and Fixed Telephony services etc. As part of CDN the IPTV project supplies may include all necessary middleware, streaming software for OTT and IPTV, (for Value Added delivery of various TV channels VoD, Live streaming of certain hospital functions) over the existing hospital's IP network.				
973	5		A DRM solution may also be considered to secure the channels and ensure delivery of services to over 100 users connected with TV and Set top boxes and mobile devices over WIFI.				
974	6		Setup local TV Channel broadcast services, at client site for recording and live streaming of ongoing activities and important events on turnkey basis				
975	7	Headend Infra Packages	To deploy each of the error-free services centrally, depending on OEM solution, the headend system may include the following:- • Local Cable TV or A/V and DVB(S2) to IP Encoders • OTT streaming server to support STB, PC, iPad, smart Phone, smart/normal TV • Media coding, streaming and distribution servers or appliances for CDN for 100~200 TVs and IPTV services for portable devices over Wireless with HTML support • Electronic Program Guide • Storage for VoD • Live/Recorded telecast of educational videos – (maximum 2 channels) • Digital Signage management solution • Software interface for Hospital Information System • System Cabinets - on as required basis	.			
976	8		Combine various Inputs: (DVB, Encrypted, Satellite, Off Air, IP (OTT), Analog, Digital, etc.) and create Custom Channel Plans for the Hospital				
977	9	IPTV Gateway	To transform various broadcasting streams (Live / Time-shift / playback / VOD etc) into IP streams for Media encoding cum streaming application. Shall support up to 60 minutes of time-shift. As part of the main headend, a 36~48 channel, A/V and DVB(S2) to IP Encoder, having inputs / outputs of CVBS MPEG2/H.264 to be supplied				
978	10	Licenses	All associated licenses shall be one-time. No recurring or renewal of licenses are acceptable.				
979	11	Media Encoders cum Streamers	To support adaptive bit rate support for output of UDP/HTTP/HLS.				
980	12		Media Encoding cum Streamer Servers - as recommended by the OEM				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
981	13	Servers, Workstations & Software	Must have HTML5 rendering engine for IPTV HTTP Live Streaming (HLS) for Wireless with HTML				
982	14		Support for Unicast & Multicast based content delivery and Support for IPTV 2.0 and later is required. Support for screen mirroring and Miracast is also preferred				
983	15		Customer specific Healthcare Portal for STB/TV, including Third party systems and integration support to setup the local TV channel streaming solutions. Integration of various other in-house IP applications such as Taxi-call, canteen ordering, hospital billing etc, including local TV broadcasting				
984	16		Adaptive Bitrate Streaming (ABR) at different bitrates for supporting multiple devices and screens				
985	17		Information cum Management Server. GUI based administrative dashboard for managing all project resources and functions of user authentication, billing, device health monitoring, distribution strategy, subscribers, channels, movies, radios, record files, etc, alongwith its network management and overall system management.				
986	18		Interactive Electronic Program Guide (EPG). The offered interactive system shall provide the interface for surfing the web, viewing educational content, entrainment tv and video-on-demand. GUI based interface thru which the Subscriber can navigate, purview various services available and select required service via EPG. It shall offers channel list, history program (defaulted as one week), details of available VOD programs, advertisement injection, etc alongwith basic functions of EPG generation, editing, synchronization.				
987	19		VOD. Apart from stored movies, key hospital activities shall be recorded and kept for explaining to the patients. Subscriber can select interested movie/video by category, and/or list instantly, or can store the content on local storage media (USB memory, USB HD, etc.) for enjoying downloaded high definition contents. Moreover, Administrator should be able to select chosen contents and put them to remote signage display on as required or schedule basis.				
988	20		Digital Signage. The centrally managed Signage cum Content Management and Delivery System, shall aid the Admin in planning, scheduling, managing and controlling various hospital information on remote displays, over Ethernet network. These remote signage displays may differ in contents and may or may not have combination of live TV streams with specific customer information like patient queue information or Taxi-call, canteen menu, hospital billing etc				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
989	21	**Live Video with Tele-Medicine Facility**	Portable, all-in-one, interactive, audio-video calling units, to connect with remote users on live, face-to-face interaction on demand. Allied accessories and devices could include videoconferencing units, peripheral HD cameras, associated software, touch screen LED display units, microphones, speakers, earphones, smartphone apps, and tablet computers etc. The whole arrangement must be movable and could easily fit on any hospital bedside. These hubs could be placed by the beds of patients in need of some remote care, or interactions and reprogrammed to suit each new patient demands on a fly.				
990	22	**Bidder Responsibilities**	Supply, installation and configuration of complete headend, servers, STBs, and middleware etc for the Signage, OTT & IPTV Distribution services are the responsibility of the vendor.				
991	23		Install at least 4 dish antenna on our terrace top and lay appropriate coaxial cables. Towards this he may liaise with our site engineers.				
992	24		Based on the above broad technical requirements, the vendor is free to offer higher or better specifications, alongwith the overall solution architecture to render the requisite services. Based on the OEM requirements, it is the responsibility of bidder to propose and provide the recommendations, in case of any such modifications required.				
993	25	**Client Responsibilities**	Provisioning of multicast enabled switches, Network infrastructure, TVs, Signage Displays including Wi-Fi Access Points are the responsibility of the client.				
994	26		Rack space for the rack-mountable project servers, works stations, storages and other similar IP hardware shall be provided by the client				
995	27	**Allied Accessories**	To be supplied alongwith all allied accessories (like power supplies, receivers, converters, encoders, transcoders, dish antennas, power dividers, amplifiers, filters, connectors, brackets, mounting kits, patch cords, connectors, video cables, licenses, etc) as per project and site requirements for the full operations of the device in line with the requirements enumerated herein, even if details are not indicated under Section-III (BoQ/BoM)				
996	28	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
997	**EE**	**Technical Specifications for Large Conference Room on 4th Floor of MEP Building**					
998	1	**Design Brief**	Due to the particular layout and the overall functional aims of the facility, the AV shall be designed with one projector, coupled with LED repeater panels alongwith a public presentation cum announcement system				
999	2	**120W Mixer-Amp**	Rated output power of not less than 120 Watts. Optimised for 7KHz speech contents. Three (03) microphone/line inputs with 3 music source inputs. Additionally, 02 zones and announcement only output is preferred.				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
1000	3	**1:6 HDMI Distribution Amplifier**	The unit should be able to reclocks and equalizes the HDMI signal and distributes it to Six identical outputs. Should have a Max. Data Rate of 6.75Gbps (2.25Gbps per graphic channel). Full HDTV/HDCP Compatibility is required. Also need Input & Output LED Indictors for each channel.				
1001	4	**20 Mtr HDMI Cables**	To connect and share one HDMI projector output with LED displays at distances beyond 15 meters. High quality 24K gold plated connector that resists corrosion and ensures an optimum connection for maximum signal transfer with high purity oxygen free copper conductor. Support to HDMI 2.0a or later. Must support Audio Return Channel, 3D, 4K, 1080P and 2160P technologies.				
1002	5	**Wall Mount Speakers**	High output, professional quality, 10" or larger 2-Way Powered Speaker System, with 80W continuous power, Class D Amplification, 8Ω, 60°x20° coverage. Maximum peak SPL 121 dB. Ideal for reproducing dynamic high and low-frequency sound for speech, perforated steel grill in front, with necessary swing with lockable wall mounts.				
1003	6	**Wireless Mic Receiver cum Distribution System**	Onmi-directional, Active, Wideband UHF Antenna systems with four-Way splitter and Power Distribution System for wireless microphones. Dual Channel, Wireless Mic receivers with associated power cables & other in-line RF devices. Ground-lift switch to help eliminate audible hum caused by ground loops, Balanced and unbalanced audio output jacks etc				
1004	7	**Wireless Lavalier Mic System**	Should have a ease of use access for the end user. Should have a Hassle free setup. Should have 10 Selectable frequencies. Should have a Multi-colour LED transmitter display. Should have a Output Impedance XLR connector: 200 Ω 1/4 inch connector: 1kΩ. Should have XLR connector (into 100K Ω load): –19 dBV, typical with 1/4 inch connector (into 100K Ω load): –5 dBV, typical. Should have Sensitivity –105 dBm for 12 dB , should have -10 dBV maximum at "mic" gain position, Should have +10 dBV maximum at 0dB gain position, should have +20 dBV maximum at -10dB gain position, Should have Gain Adjustment Range 30 dB, Should have Input Impedance 1mΩ,				

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2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
1005	8	**Wireless Handheld Mics**	Handheld Wireless Microphone Transmitter with an interchangeable microphone cartridge that transmits wireless audio with pure digital clarity and rock-solid reliability coupled with a Wireless Receiver, 24-Bit, 48 kHz digital audio technology for wireless. Up to 8 compatible channels per frequency band. 100 m (300 ft.) operating range; Multi-colour LED indicating power, lockout, mute and low battery. The frequency Agile UHF design shall provide up to 90 selectable UHF frequencies that operate on an 18MHz UHF bandwidth. More than eight hours of continuous use with two rechargeable AA batteries. Diversity Reception system with twin receiver circuits to minimise noise and drop out caused by RF interference. Locking battery compartment with secure latch and robust design. Switch to eliminate audible hum caused by ground loops.				
1006	9	**Podium Goose-neck Mics**	12" Gooseneck, Rostrum mounted, Microphone, suitable for classroom cum public speaking, Transducer Type: Condenser / Directivity: Cardioid / Super cardioid, Frequency Response: 50 - 17.000 Hz, Impedance of 180 Ohms, with built-in features of Integrated Pre-Amp, Pneumatic Vibration absorber, and operating Controls: On/Off Switch etc. To be supplied with OEM Rostrum mount.				
1007	10	**Graphic Equalizer**	Multi-channel mixing console with 2.7 seconds of Alignment and Zone Delay, GUI control, Classic dbx Compression and Limiting, Graphic and Parametric EQ, Auto-EQ Function, Full Band pass, Crossover, and Routing Configurations, Auto Gain Control, Pink Noise Generator and RTA, Security Lockout, Wall Panel Control Inputs. 2x6 DSP, XLR balanced outputs, Feedback elimination, Power Amp tunings etc				
1008	11	**12U Control Rack**	12U closed floor rack with wheels, having 600mm depth, Front Glass door with locks, Openable Side Panels with Locks x 2, Cooling Fans 90 CFM 230 VAC x 2, Six (06) Socket, 5/15 Amp Power Supply Unit with TVSS, Sliding Cantilever Tray 1U x 6, all other associated kit complete as required.				
1009	12	**Ceiling Mount 3000-3500 ANSI lumens Projector**	Ceiling mount projector with suitable mounts, 3000~3500 ANSI lumen brightness, with Contrast ratio of 12,000:1 or better, Resolution: 1920x1200, Aspect Ratio: 16:10 (WUXGA), HDMI ports for both In and Out. Shall have Digital Keystone for both Horizontal and vertical adjustments. Throw distance adjustments from 02 to 08 meters. Wired and wireless interface preferred.				
1010	13	**55" LED Displays with VESA Wall mount**	55" or larger flat panel LED display having Full HD resolution, with 178 ~ 178 deg viewing angles, HDMI inputs, Anti-glare screen, remote etc. This display shall be wall mounted using Full motion or 90° Swivelable VESA mounts for maximum viewing flexibility. VESA plate can be taken off for easy installation.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
1011	14	**Projector Screen**	210" diagonal, 16:10 formats, electric screen, Screen with 3Mtr power cord, in-line switch, with 230V motor and LVC controller, remote control etc. Matt White, peak gain 1.0; Consider extra drop of the screen. To be fixed on the ceiling				
1012	15	**Allied Accessories**	All AV components, associated system parts, ports, cards, interfaces, cables, wires, connectors, licensing allocations, materials and sizes and naming conventions etc may differ from each AV OEM to OEMs. It is therefore, very important for every AV & PA bidder to note and understand that the overall responsibility and the onus to propose and include any, and all items required for a complete commissioning of system or project solutions (as envisaged for handing over to Marriott) whether or not, it is identified or mentioned in these documents, or its attachments or enclosures or annexure rests solely with the respective bidder. Accordingly, the Successful Bidder (hereinafter referred as Contractor) shall have to complete, test commission and handover the project at his risk and expenses.				
1013	16	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
1014	**FF**	**Technical Specifications for 12-Seater, Board Room @ Second Floor of MEP Building**					
1015	1	**1:2 HDMI Distribution Amplifier**	The unit should be able to reclocks and equalizes the HDMI signal and distributes it to Two identical outputs. Max. Data Rate — 6.75Gbps (2.25Gbps per graphic channel). HDTV Compatible, HDCP Compliant. Input & Output LED Indictors.				
1016	2	**55" LED Displays with VESA Wall mount**	55" or larger flat panel LED display having Full HD resolution, with 178 ~ 178 deg viewing angles, HDMI inputs, Anti-glare screen, remote etc. This display shall be wall mounted using Full motion or 90° Swivel based VESA mounts for maximum viewing flexibility. VESA plate can be taken off for easy installation.				
1017	3	**15 Mtr HDMI Cables**	To connect and share one HDMI projector output with LED displays at distances upto 15 meters. High quality 24K gold plated connector that resists corrosion and ensures an optimum connection for maximum signal transfer with high purity oxygen free copper conductor. Support to HDMI 2.0a or later. Must support Audio Return Channel, 3D, 4K, 1080P and 2160P technologies.				
1018	4	**6U Control Rack**	6U closed floor rack with wheels, having 600mm depth, Front Glass door with locks, Openable Side Panels with Locks, Cooling Fans 90 CFM 230 VAC, Six (06) Socket, 5/15 Amp Power Supply Unit with TVSS, Sliding Cantilever Tray 1U x 3, all other associated kit complete as required.				
1019	5	**Desktop Convenience Outlet**	Desktop Convenience Outlets with 1 HDMI, 1 VGA, 1 Power Socket and one RJ45				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
1020	6	**Allied Accessories**	All AV components, associated system parts, ports, cards, interfaces, cables, wires, connectors, licensing allocations, materials and sizes and naming conventions etc may differ from each AV OEM to OEMs. It is therefore, very important for every AV & PA bidder to note and understand that the overall responsibility and the onus to propose and include any, and all items required for a complete commissioning of system or project solutions (as envisaged for handing over to Marriott) whether or not, it is identified or mentioned in these documents, or its attachments or enclosures or annexure rests solely with the respective bidder. Accordingly, the Successful Bidder (hereinafter referred as Contractor) shall have to complete, test commission and handover the project at his risk and expenses.				
1021	7	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
1022	**GG**	**Technical Specifications for PA System for MEP Building**					
1023	1	**480W Mixer-Amplifier**	Six Zone, Mixer-Amplifier, with rated output power of not less than 480 Watts. Three (03) microphone/line inputs with 3 music source inputs. Should have Minimum guaranteed power for 70V/100V output. Should have 1 kHz Power: refers to maximum power in watts at 1 kHz with 0.5% THD. Should have Frequency Response (at 1 watt from 4-Ohm tap): 70 Hz to 19 kHz ± 1 dB, Optimised for 7KHz speech contents. Frequency Response (at line out): 20 Hz to 20 kHz ± 1 dB. Power Bandwidth (at 4-ohm tap, 2 dB below maximum 1 kHz power): 50 Hz to 20 kHz with < 0.5% THD Signal to Noise Ratio (ref. to rated power, master volume at minimum): 85 dB. DC Output Offset: < ±5 mV. THD: Less than 0.5% at rated power at 1 kHz. Input Sensitivity (for full output at maximum gain): XLR-type and ¼" metal jack connector sockets RCA phono stereo playback inputs and record outputs, EQ Inputs: 3-band for mono inputs, TRS insert sockets and inserts on all mono inputs and mix output, Rack mountable. Both solutions offering combined Mixer-Amp or independent Amplifier and Mixer are acceptable				
1024	2	**Ceiling Speakers (Pendant or direct Mountable)**	No Ceiling Available. Frequency Range: 85 Hz - 25 kHz, Rated RMS: 6/12W @ 100V, Driver size: 6" Dual cone, Sensitivity: 90dB, Distortion: Less than 3%, Freq Response: 100Hz to15kHz, Dispersion Angle: More than 90 deg cone, Colour: White				
1025	3	**Array or Column or Wall Mount Speakers**	Rated RMS: 15W @100V, Driver size: 4" Dome, Sensitivity: 90dB, Distortion: Less than 3%, Freq Response: 160Hz - 20KHz, Dispersion Angle: 90°(V) x 100°(H), Colour: White, Material: ABS or Aluminium enclosure.				

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
1026	4	**Zone Selector**	Combined zone selector with desktop mic is also acceptable. Six zone selector. Audio Sources: Depending on project Amplifier capability. Power Handling: Over 350W per channel, Input: Upto 4 program & 1 priority channels on 100V signal, Speaker Output: Selectable in groups, independent zones, Priority Bus: Channels activated by 0V signal, Alarm Output: 0V signal, Controls: Push-button zone selectors, Power Requirements: 220~240V AC, 50/60 Hz or 24V DC, Dimension: Rack mountable options to be supplied with kits				
1027	5	**Desktop Call Station & Microphones**	Combined six zone selector with desktop mic is also acceptable. Desktop Pager microphone, Transducer: Cardioid. AF Bandwidth: 150 to 15kHz, Sensitivity: 2.2 mV/Pa, Load Impedance: 2K Ohms, Impedance: 530 Ohms, SNR: 68 dB @ 94 dB SPL. Connector: XLR Male, Control: On/Off Button or PTT				
1028	6	**9U Rack**	9U (600W x 600D)mm wall mounted, closed rack with front glass door, fan tray on top, perforated sides and rear doors, 2 tray/shelf, openable entry at the bottom for the cable & one nos of 6 socket 6/16 amp horizontal power strip with spike arrestor, two fans, standard accessories, ground and bonding stripes etc. These racks shall have aqua tight non-metallic conduit for cable entry from top and grounding facility to maintain the integrity of isolated ground.				
1029	7	**Allied Accessories**	OEM Brackets for above Speakers - on required basis (Wall, Ceiling etc). All AV components, associated system parts, ports, cards, interfaces, cables, wires, connectors, licensing allocations, materials and sizes and naming conventions etc may differ from each AV OEM to OEMs. It is therefore, very important for every AV & PA bidder to note and understand that the overall responsibility and the onus to propose and include any, and all items required for a complete commissioning of system or project solutions (as envisaged for handing over to Marriott) whether or not, it is identified or mentioned in these documents, or its attachments or enclosures or annexure rests solely with the respective bidder. Accordingly, the Successful Bidder (hereinafter referred as Contractor) shall have to complete, test commission and handover the project at his risk and expenses.				
1030	8	**Other Value-Added Features**	List other value-added features, if any that are useful to the Buyer				
1031	HH	**Negative Points**					

	B	C	D	E	F	G	H
2	#	Parameters	Specific Technical Needs or Project Requirements	Full Compliance (Yes/No)	Enclosed References	Partial Compliances	Product Web Links
1032	1	Any wrong presentation of facts, false compliance statements, will carry xxxx negative points each					
1033	2	Any inadequacy in documentation will carry xxxx negative points each					
1034	3	Each Conditional Technical Arguments will carry xxxx minus points each					
1035	4	Number of Items Quoted outside the Approved OEMs. Every Item quoted outside the approved OEM will					
1036	5	**Total Points Technical Points**					

Section-IV - BOQ for ELV (Supply, Install, Test & Prove) - Actives & Miscellaneous Project Components (Part of Cover-3)

Client: NS Hospital, Quilon

Phase-II - Supply, Installation, Testing, Documentation, Proving and Handing over of complete ELV project components - as per the Technical Specifications and the Project needs indicated. (All offered items shall have minimum OEM defect liability warrantee support on NBD basis for 1-year with all version and patch upgrades)

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
1)	**Secure Gateway Router**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. A**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
2)	**Modular L3 Core Switch**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. B**	Nos	2	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
3)	**Server-Farm or DMZ Switch**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. C**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
4)	**48-Port Edge Switch**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. D** (-PoE)	Nos	17	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
5)	**48-Port Edge Switch - PoE**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. D**	Nos	16	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
6)	**24-Port Edge Switch**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. E**	Nos	3	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
7)	**24-Port Edge Switch - PoE**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. E**	Nos	8	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
8)	**Internal DMZ UTM Device**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. F**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
9)	**High-Density Wireless Access Point - Type-1**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. G**	Nos	52	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
10)	**In-wall, In-room Wireless Access Point-Type - 2**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. H**	Nos	105	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
11)	**On-Premise Wireless LAN Controller**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. I**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	Per-AP license required to Control and enable 250 project APs	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
12)	**SFP or SFP+ or QSFP Trans-receiver Modules**											
a	10GBase-SR Multimode SFP or SFP+ with enhanced Digital Diagnostic Monitoring Interface (DDMI)	Nos	68	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	1G-SR MM SFP; Small Form Factor Pluggable 1000Base-SX Gigabit Ethernet Optics	Nos	10	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	1G Copper SFP; Small Form Factor Pluggable 10/100/1000 Copper Transceiver Module	Nos	20	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
13)	**Stacking & DAC Cables**											
a	Stacking Cable for Access Switch - Assorted Lengths - As per project needs	Nos	38	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	5Mtr, 10G DAC Cable for Connecting to Core and Server Farm Switch	Nos	6	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
14)	**IP Paging cum Back-Ground Music (BGM) System - Networked Power Amplifiers**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. J (Main Units)**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	Sub Units of Serial 14 (a)	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	Other Essential add-on components (to meet the functionalities requested)	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
15)	**IP Paging cum Back-Ground Music (BGM) System - IP Backend DSP Processors**											

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. K (Main Units)**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	VOIP / SIP Interface with Licenses	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	Mixer & Messaging Server Units	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	Other Essential add-on components (to meet the functionalities requested)	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
16)	**IP Paging cum Music (BGM) System - Front-end Systems**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. L1**	Nos	275	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. L2**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. L3**	Nos	5	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. L4**	Nos	12	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
e	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. L5**	Nos	90	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
f	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. L6** (Alternate to L5)	Nos	90	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
17)	**Nurse Call Systems**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. M1**	Nos	9	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. M2**	Nos	165	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. M3**	Nos	95	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. M4**	Nos	98	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
e	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. M5**	Nos	17	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
f	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. M6**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
g	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. M7**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
18)	**Integrated ICT Room Infrastructure Build**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. from N1 to N13, less N11 (-N11).**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	KVM over IP Switch as per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # No. from **N11.**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
8)	**IP/SIP Telephony Gateway cum Call centre based Help Desking**											
a	Active-Active/Active-Passive SIP PBX with support for 1500 SIP extensions	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	Concurrent Mobility (VoWLAN support) and UC Licenses	Nos	200	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. O12, O18, O26-29, O35-46.**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	Zonal Paging capabilities as per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. O51**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
e	Independent E1 PRI / PRA bi-directional trunks and 10 CO trunks with tight integration with existing Analog PBX	Nos	2	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
f	Supply of necessary servers, storage, and allied accessories for the functions mentioned under tech specs	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
14)	**SIP/IP Telephony Handsets**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. P2-P20**	Nos	25	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. P21-41**	Nos	40	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. P42-60**	Nos	65	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. P61-76**	Nos	190	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
15)	**Server Virtualisation - Hypervisor**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. Q**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
16)	**Desktop Virtualization (VDI)**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. R**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
17)	**Zero / Thin-Clients**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. S**	Nos	70	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
18)	**Tape Library Components**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. T**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
19)	**Backup Software Solution**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. U**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
20)	**Rack Servers**											

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. V**	Nos	2	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
21)	**Unified Storage**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. W**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
22)	**IP Video Surveillance Camera Type-1**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. X**	Nos	84	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
23)	**IP Video Surveillance Camera Type-2**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. Y**	Nos	99	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
24)	**IP Video Surveillance Camera Type-3**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. Z**	Nos	35	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
25)	**IP Video Surveillance Network Video Recording Software / Storage Device**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. AA**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. AA, 27**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. AA, 28**	Nos	2	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. AA, 29**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
26)	**Access Control & Attendance Management System**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. CC**	Doors	47	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. CC, 13**	Nos	300	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
27)	**Signage, OTT & IPTV Distribution Components**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. DD**	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. DD 21**	Nos	2	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
28)	**Large Meeting Room on 4th Floor of MEP Building**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 2**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 3**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 4**	Nos	4	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 5**	Nos	6	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
e	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 6**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
f	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 7**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
g	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 8**	Nos	2	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
h	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 9**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
j	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 10**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
k	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 11**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
m	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 12**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
n	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 13**	Nos	6	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
p	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. EE, 14**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
29)	**12-Seater, Board Room @ Second Floor of MEP**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. FF, 1**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. FF, 3**	Nos	6	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. FF, 4**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. FF, 5**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
30)	**Analog PA Systems for Services (MEP) Block**											
a	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. GG, 1**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. GG, 2**	Nos	25	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
c	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. GG, 3**	Nos	18	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. GG, 4**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0

#	Description of ELV Items	Unit	Qty	Unit Rate	Basic Cost	GST %	Material Cost	Unit Labour	GST %	Total Labour	Labour with GST	Amount
d	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. GG, 5**	Nos	2	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
e	As per the Technical Specifications and minimum Project Requirements indicated at Section-II, Tech Specs Ref: # **No. GG, 6**	Nos	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
31)	**Other Essential Project Components** (Not Covered in Above Lists)											
a		Nos		₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b		Nos		₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
32)	**Facility Management with On-site Operations & Maintenance**											
a	Refers to Para 74 of Main Document (Section - I) - for first Six Months	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
b	Refers to Para 74 of Main Document (Section - I) - for Six to Twelve Months	Lot	1	₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
33)	**Warranty with Defect Liability on NBD Basis**											
a	Refers to Para 73 of Main Document (Section - I) - for first year	Lot		₹ 0	₹ 0	0%	₹ 0	₹ 0	18%	₹ 0	₹ 0	₹ 0
Net Amount for the Supply, Labour, Tax etc of above							**₹ 0**					**₹ 0**

Section-V - List of Approved OEM Makes & Product Suppliers (Part of Cover - 2)

Client: NS Hospital, Quilon

#	DESCRIPTION	APPROVED MAKES OF MATERIALS	BIDDER SELECTED OEM DETAILS		
			OEM	MODEL	VERSION
1	Integrated ICT Room Infrastructure Build	Schneider Electric/APC, Liebert/Emerson, Rital, Legrand, GE, HP Only			
2	Audio Speaker Systems & Wall Controllers	Bosch, Yamaha, Audac, Apart, Honeywell, JBL, Russound, Toa, Tannoy, JBL, Quest, QSG			
3	DSP Controls for Audio	QSG, Biamp, Honeywell, Clearone, AMX, BSSAudio, Kramer and any Manufactures supporting AVoIP, AVB, IPBaseT or SDVoE protocols			
4	Power Amps & Mixer-Amps	Bosch, Yamaha, QSG, Biamp, Honeywell, JBL, Russound, Toa, Apart			
5	Active Networking Devices, Gateway Security, etc	Cisco, Juniper, HP, Brocade, Alcatel-Lucent, NetGear, Extreme Networks			
6	Internal DMZ UTM	Cyberroam/Sophos, FortiGate, SonicWall, Cisco			
7	WLAN AP & WLAN Controller	Cisco, Aruba/HP, Ruckus, Zyxel, Samsung, Engenius, Extreme Networks, Ubiquity			
8	Nurse-Call Systems	Alcad, IndigoCare, AceTek, SchRack Seconet, Crea, Austco/Medicom, Tacera, Fusion-IP, Advance Care, Connexus, GE/Ascom, Jeron, TekTone, Honeywell			
9	PVC Conduits	VIP, BALCO, AKG, Precision, Universal or Kelachandra			
10	KVM over IP	Raritan, Aten, Adder, CyberView, Raloy, Rose Ultramatrix			
11	IP-PABX	Alcatel, Avaya, Cisco, Unify, Panasonic, NEC			
12	3rd Party SIP Phones	ClearOne, Polycom, Patton, Ascom, Doro, Innovaphone, Grandstream, Snorm, Matrix, Yealink, Sangoma			
13	Server Virtualisation - Hypervisor	VMWare, Windows, Linux, Citrix			
14	Desktop Virtualization (VDI)	VMWare, Windows, Linux, Citrix			
15	Zero / Thin-Clients	Dell Wyse, Fujitsu, Hewlett-Packard, Pano Logic, IGEL, ViewSonic, Samsung and Teradici			

#	DESCRIPTION	APPROVED MAKES OF MATERIALS	BIDDER SELECTED OEM DETAILS		
			OEM	MODEL	VERSION
16	Tape Library with Backup Solution	HP, IBM, Dell, Fujitsu, Oracle, Overland Storage, Quantum			
17	Backup Software	Symantec NetBackup or Backup Exec; Tivoli TSM; EMC Legato Networker; Computer Associates BrightStor; HP Data Protector; and CommVault Simpana.			
18	Servers	IBM, HP, Wipro, Cisco, Fujitsu or Dell			
19	Storage	HP / EMC / NetApp / IBM / Dell / X-IO / Hitachi / Fujitsu / Violin / Nimbus			
20	Video Surveillance	Avigilion, Axis, ACTi, Bosch, Cisco, Dallmeier, Mobotix, Pelco, Sony, Vivotek, Hanwah-Techwin, Canon			
21	NVR/VMS Software	Camera OEM, Genetec, Milestone, Axxonsoft			
22	Access Control & Attendance Management System	Assa Abloy, Rosslare, Bosch, Siemens, Honeywell, Matrix, Axis, Suprema, infinias, 3M, Tyco, HID, Kabba, Ingersoll Rand, RBH, IDCube			
23	16-Port, Rackmount, KVM over IP Switch with OSD & Cables	Iogear, StarTech, D-Link, Aten, Trendnet, Raritan, Tripp Lite,			
24	Signage, OTT & IPTV Distribution	Alcad, CatVision, Antik Telecom, VidOvation, Zafiro, Grundig, Triax, Rohde & Schwarz, Holland Electronics, Wind Telecommunications, Aksh, Belgacom, Arcor/Vodafone, Astro, AT&T, Bell Aliant, Bouygues Telecom, VTC Digicom. Telekom Austria, BH Telecom, United Internet, Verizon, Vimpelcom and Amis			
25	IPTV Displays	LG, Samsung, Philips, NEC, Sony, Sharp			
26	Static LED Displays	LG, Samsung, Philips, NEC, Sony			
27	Video with Tele-Medicine	Lifesize, Cisco, Polycom, Sony			
28	Ceiling Mounted Projector	BenQ, Sony, NEC, Hitachi, Vivitek, Epson			
29	HDMI Cables	Kramer, Extron, AMX, Crestron, Honeywell			
30	1:6 HDMI Distribution Amplifier	Kramer, Extron, AMX, Crestron			
31	Projector Screen	DNP, Da-lite, Draper, Liberty			
32	Microphones	Bayerdynamics, Shure, Audio Technica, Senheiser			

#	DESCRIPTION	APPROVED MAKES OF MATERIALS	BIDDER SELECTED OEM DETAILS		
			OEM	MODEL	VERSION
33	Desktop Convenience Outlets with HDMI, VGA, Audio, Power, LAN	Schneider, Teleadapt, Legrand			