Government of India
Ministry of Home Affairs

REQUEST FOR PROPOSAL

FOR

SUPPLY,INSTALLATION AND COMMISSIONING OF

"Integrated Control Room for Emergency Response (ICR-ER) at MHA, New Delhi"

OPEN TENDER ENQUIRY NO. 41-14/2016-NDM-I/AD Dated: 17.09.2019

Government of India

Ministry of Home Affairs
DM Division
3rd Floor, NDCC-II Building
Jai Singh Road
New Delhi – 110 011
Tel No. 01123438123 Fax No. 01123438252
Email: dirdm1@nic.in

To

Sir,

Online Bids are invited for and on behalf of the President of India, through two bid system (Technical and Financial) for supply/installation/commissioning of "**Integrated Control Room for Emergency Response (ICR-ER) at MHA, New Delhi** as per details in the schedule to tender.

2. The conditions of Contract, will be governed by GFR-2017 and Manual for Procurement of Goods-2017 published by Ministry of Finance. Complete Tender documents can be downloaded **FREE OF COST.** Any special conditions attached to this invitation to tender will also form part of the conditions. The details can be seen at website **https://eprocure.gov.in/eprocure/app** and official web site of MHA i.e. www.mha.gov.in.

3. Copies of GFR – 2017 and Manual for Procurement of Goods-2017 published by Ministry of Finance from website of Ministry of Finance.

4. If you are in a position to quote for supply in accordance with the requirements stated in the attached Schedule to Tender, all documents attached herewith should be duly filled in (wherever necessary), signed and scanned copy of the same should be uploaded while submitting online tenders.

5. This bid documents consists of various documents mentioned in Index.

Yours faithfully,

(Suresh Kumar)
Deputy Secretary to the Government of India
For and on behalf of the President of India

(सुरेश कुमार)
(SURESH KUMAR)
उप सचिव
Deputy Secretary
गृह मंत्रालय
Ministry of Home Affairs
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

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TENDER NOTICE

Online Bids are invited for and on behalf of the President of India, through two bid system (Technical and Financial) for supply/installation/commissioning of **"Integrated Control Room for Emergency Response (ICR-ER) at MHA, New Delhi** as per details in the schedule to tender **as per details given below:-**

Tender Document will be available on **http://eprocure.gov.in/eprocure/app** and **www.mha.gov.in**	**From: 17.09.2019 at 5.00 PM to 24.10.2019 at 0200 PM**
Doubts and queries regarding tender document should be **Email:ashish.singh@nic.in** by tenderers (Bid clarifications)	**From: 17.09.2019 at 5.00 PM to 03.10.2019 by 12 .00AM**
Pre-bid conference will be held at DM Division, MHA, NDCC-II Building, Jai Singh Road, N Delhi-110001	**On: 04.10.2019 at 02.30 AM**
Bid submission start date	**On: 15.10.2019 at 11.00 AM**
Tenders, in two parts, should be submitted online	**By: 24.10.2019 by 02.00 PM**
Part-A (Techno-commercial) of the tenders will be opened	**On: 25.10.2019 at 02.30 PM**
Offer validity of tender (180 Days from date of opening of Tender)	**Up to: 25.04.2020**
Cost of Tender Sets (Non-refundable)	NIL
Earnest Money Deposit	**Rs. 50,00,000 (Rupees Fifty Lakhs only only)**
Terms of delivery	**CIP/FOR destination**. The Seller will deliver the stores at **consignees location**
Description of Project	**Consignee**
Integrated Control Room for Emergency Response (ICR-ER) at MHA, New Delhi	DM Division, MHA, NDCC-II Building,New Delhi MHA Control Room, North Block New Delhi NRSC Sadnagar, Hydrabad

Note: Above Notice/Tender documents are available on official website of Ministry of Home Affairs: http:/mha.nic.in & Central Public Procurement Portal **https://eprocure.gov.in/eprocure/app.**

(Suresh Kumar)
Deputy Secretary to the Government of India
For and on behalf of the President of India

(सुरेश कुमार)
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Ministry of Home Affairs
भारत सरकार, नई दिल्ली
Govt. of India, N. Delhi

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ANNEXURE 1

SCHEDULE TO TENDER

1.	Description of the stores	**Integrated Control Room for Emergency Response (ICR-ER) at MHA, New Delhi**	
2.	Quantity of store	**(As per Technical specification attached at Appendix-II)**	
3.	Date of Issue / Publishing	:	17/09/2019
4.	Document Download start Date	:	17/09/2019 AT 05.00 PM
5.	Document Download/ Sale End Date	:	24/10/2019 AT 02.00 PM
6.	Clarification Start Date	:	17/09/2019/2019 AT 05.00 PM
7.	Clarification End Date	:	03/10/2019 AT 12.00 AM
8.	Last Date and Time for uploading of Bids by	:	24/10/2019 AT 02.00 PM
9.	Date and Time of opening of Bids on	:	**25/10/2019 AT 02.30 PM**
10.	Date and time of pre bid meeting	:	04/10//2019 AT 02:30 AM (At Conference Hall, 2nd Floor, NDCC-II Building, Jai Singh Road, New Delhi) ***(*Note: tenderers should visit the site to understand the scope of work before pre-bid meeting/submission of bids)***
11.	Bid submission start date		**15/10/2019 AT 11.00 PM**
12.	Mode of depositing the bids	:	Online through Central Public Procurement Portal. **www. eprocure.gov.in/ eprocure/app**
13.	Place for depositing tender samples(wherever so applicable)	:	Not Applicable.
14.	Tender Cost	:	Free of cost.
15.	EMD	:	**Rs. 50,00,000**/- (Rupees Fifty Lakhs only) as per instruction under Clause **11** at Annexure-II of Tender. (EMD remain valid for a period of 45 days beyond the period of offer validity).
16.	Validity of offer	:	**25/04/2020 (180 days** from the date of opening of Tender).
17.	Price format	:	As per price schedule at **appendix 10**
18.	Joint Review Inspection	:	At the site (i)DM Division, MHA, NDCC-II Building,New Delhi (ii) MHA Control Room, North Block New Delhi (iii) NRSC Sadhnagar, Hydrabad. By a Committee of Officers nominated by MHA Stores shall be inspected along with (i) Manufactures works test certificate confirming to specification and (ii) Guarantee/warranty undertaking from OEM for the period of Three (03) year.
	(c) Inspection methodology		Will be carried out as per instruction under **Clause 5 of Annexure IV.**
19.	Delivery Period	:	***180 days*** from the date of issue of Award of Tender/Supply order/***civil& electrical works and also HVAC.***
20.	Period of Guarantee / Warranty	:	03 year for all equipment/systems/ Software from the date of successful commissioning of turnkey project and training to the entire satisfaction of Consignee.
21.	After sale service support/ Comprehensive Annual Maintenance	:	• Bidder shall quote rates for CAMC separately for additional ***Three years***(further extendable for two years

(SURESH KUMAR)
Deputy Secretary
Ministry of Home Affairs

	Contract (CAMC)		as per the same terms & conditions and cost @ the last CAMC rate), after the warranty period ***of three years***, on quarterly payment basis based on satisfactory performance certification by the end-user. • The rates quoted for AMC will have impact on the status of L-1 firm as per DCF (Discounted Cash Flow) method. • Supplier shall undertake to enter into AMC. • Complete training of operation/application/System administration for at least 30 days at user site should be provided to 30 persons from end-user side. • Appropriate brochures, technical literature, catalogues and other data from the manufacture/principals (with authorized signature and seal of the firm on brochures/literature) should be provided with equipment free of cost. • The supplier should provide the tool kit, hard/soft copy of operational manual and other relevant literature along with certificate of library/data base, software and other items wherever applicable • The supplier should provide quarterly preventive maintenance visits per year, as per the requirement of end-user.
22.	User License		• User License for the equipments (wherever applicable)should be in favour of Joint Secretary (Disaster Management),DM Division, MHA, 3rd Floor, NDCC-II, Jai Singh Raod, New Delhi-110 001.
23.	This tender set is not transferrable.		
24.	Purchaser		THE PRESIDENT OF INDIA (Through Ministry of Home Affairs).

(Suresh Kumar)
Deputy Secretary to the Government of India
For and on behalf of the President of India

(SURESH KUMAR)
Deputy Secretary
Ministry of Home Affairs
Govt. of India, New Delhi

ANNEXURE II

INSTRUCTION TO THE TENDERER

For and on behalf of the President of India, DM Division, Ministry of Home Affairs, India Invites tender from eligible and qualified bidders for supply, installation and commissioning of **"Integrated Control Room for Emergency Response (ICR-ER) at MHA, New Delhi"**as specified in **Appendix-2** of OTE. All offers should be in prescribed format written in Hindi or English. All correspondence should be made only with tender inviting authority. The important points are as under:-

A **Submission of Proposal/Bid:** Tenderer shall submit their proposal/bid on Central Procurement Portal only i.e.www.eprocure.gov.in. Proposal submitted through any other means will not be considered. Tenderer are advised to follow the instructions provided in the **"Instructions to the contractors/tenderer/bidders for the e-submission of bids online through the Central Public Procurement Portal for e procurement at https://eprocure.gov.in/eprocure/appl".**

B **Tender Fee & Availability of Tender Documents:** Tender documents is **free of cost** and complete tender document shall be placed on the Central Procurement Portal www.eprocure.gov.in and department website of http:/mha.gov.in

C **Pre bid meeting/clarifications (PBM)**: A pre bid meeting will be conducted as per details mentioned in the NIT to clarify doubts of potential bidders in respect of the procurement. Prospective bidders/firms can attend the pre bid meeting on due date and time ***and also visit the site to understand the scope of ICR-ER implementation works Civil/PH/Electrical/HVAC, Computer Systems, Network components, Video walls, Furniture etc., before quoting***. Pre bid query if any can be Email within stipulated time clearly specifying clause, existing provision, enquiry in respect of existing clause at email address **ashish.singh@nic.in Bid should be submitted only after the PBM** so as to take care of the changes made in bidding document. The changes made to the bidding document subsequent to the PBM shall be treated as amended to the bidding document and the same also be hosted on CPP Portal and MHA website.

D **Submission of EMD:**

Hard copy of original EMD instrument should be deposited **offline** directly to **Office of Joint Secretary, DM Division, MHA, NDCC-II Building, Jai Singh Road, New Delhi– 110001 on or before 23/10/2019 at 02.00 PM and scanned copy of the same should be uploaded along with other tender documents failing which their offer will be summarily rejected.**

E **Changes in the bidding document:** At any time, prior to the deadline for submission of bids, department may for any reason, whether on its own initiative or as a result of a request for clarification by the bidder, modify the bidding documents by issuing an addendum. Copy of such addendums will be available for download at CPP Portal without any additional cost. **Any bidder, who has submitted his bid in response to the original invitation, shall have the opportunity to modify or re-submit it as the case may be within the period of time originally allotted or such extended time as may be allowed for submission of bids, when changes are made to the bidding document by the Department**

F. **The tenderer** should quote for the entire Turnkey Project Solution.

G. **Who can Bid:**

Quotations are invited from the Joint Venture (JV) (Not Consortium) firms or System Integrators or Turnkey Solution Providers, who fulfil the Qualification criteria defined in this RFP in Para 5. Individual firms bidding under JV category and bidding as System Integrators or Turnkey Solution

(सुरेश कुमार)
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Providers should be registered under the Company Act, 1956 or a company statutory body owned by Central/State Government, having Income-Tax Permanent Account Number (PAN).

Credentials of the partners of Joint Ventures can not (repeat can not) be clubbed for the purpose of compliance of PQC in supply of Goods/Equipment, and each partner must comply with all the PQC criteria independently. However, for the purpose of qualifying the Financial Standing Criteria, the financial Standing credentials of a Holding Company can be clubbed with only one of the fully owned subsidiary bidding company, with appropriate legal documents proving such ownership.

I. Bidders are advised to quote against the tender directly, without involving any agent.

II. MHA has full rights to verify the credentials of Bidders against Bankruptcy, Criminal charges, blacklisting/ debarred by any govt. agencies and bidders should not be involved in any anti National activities. Bidder will enclose all necessary supportive documents to provide self-certification that firm is not debarred/blacklisted by any govt. agency, not having criminal charges against them and is not involved in any anti national activities.

III. A bidder who has been debarred by any procuring entity for violation of above para shall not be eligible for the duration of debarment.

IV. False declarations will be in breach of the Code of Integrity Rule 175(1)(i)(h) of General Financial Rule for which a bidder or its successor can be debarred for up to two years as per rule 151(iii) of the General Financial Rules along with such actions as may be permissible under law.

V. If the bidder is not the OEM of servers and Networking equipment, he should produce an Agreement certificate from OEM of Servers and Networking equipment for ensuring the after sales support during the warranty and CAMC period.

VI. In case of bidder having arrangement of sublet of works like Civil, Electrical and HVAC, Computer Systems, Network components, Video walls, Furniture etc., those firms should have adequate experience in execution of similar quantum of work/amount and details of their credentials along with Undertaking about their tie up for the work shall be furnished by bidder in Part-I of tender for technical evaluation.

VII. Authorized Representatives: Bids of bidders quoting as authorised representative of a principal manufacturer would also be considered to be qualified, provided:

(a) their principal manufacturer meets all the criteria above without exemption, and

(b) the principal manufacturer furnishes a legally enforceable tender-specific authorisation in the prescribed form assuring full guarantee and warranty obligations as per the general and special conditions of contract; and

(c). the bidder himself should have been associated, as authorised representative of the same or other Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service) for same or similar 'Product' for past three years ending on 31 March 2019.

(viii). Extant Government policies and orders on eligibility and related relaxations/exemptions applicable in case of firms/bidders participating in the instant tender in the category of 'Startups' in the field of 'IT & Networking' only will be applicable in the instant tender also, subject to

meeting of quality & technical specifications. The firms/bidders in this regard have to enclose relevant documents to substantiate their candidature in the category of 'Startups' in the field of 'IT & Networking', along with the supporting documents/Govt orders to seek any relaxation/ exemption due to their status as 'Starups' in the bidding process. In absence of these substantiating/supporting documents, such bids will be declared non-responsive bids and the same will not be considered for further evaluation. Candidature of such firms/bidders participating in the category of 'Starups' in the field of 'IT & Networking' will be examined by the Buyer and the decision of Buyer will be final in this regard.

(ix). Buyer reserves the right to reject any or all bids at its discretion unilaterally, without assigning any reasons.

3. Definitions

i. **Buyer:** "Buyer" shall mean the President of India acting through DM Division, Ministry of Home Affairs, NDCC – II Building, Jai Singh Road, New Delhi 110001 and also includes its successors in office and assignees.

ii. **Contract:** "Contract," means the invitation to Tender instructions to Tenderer, Tender, agreement/ acceptance of Tender particular.

iii. **Purchaser:** "Purchaser" shall mean the President of India acting through Director / Deputy Secretary (DM-I), DM Division, Ministry of Home Affairs, NDCC-II Building, Jai Singh Road, New Delhi and also include his successors in office.

iv. **Tenderer/ Bidder:** "Tenderer/Bidder" shall mean an individual or firm or company, whether incorporated about, undertaking the works and shall include the legal personal representativesofsuchindividualorthepersonscomposingsuchfirmorcompany or the successor of such firm or company and the permitted assigns of such individual or firm or company.

v. **"Secretary"** means Secretary of Government of India, Ministry of Home Affairs, New Delhi for the time being in the administrative charge of the subject matter of contract and every other officer authorized for the time being to execute contracts relating to purchase and supply of stores on behalf of the President of India.

4. Eligibility Condition:

The tenders will be scrutinized to determine whether they are complete and meet the essential and important requirements, conditions etc.as prescribed in the RFP documents. The tenders which do not meet the basic requirements, will be treated as non-responsive and will be summarily ignored. A Tender shall be declared non-responsive and will be summarily ignored on the following grounds:-

i) Tender is unsigned or not signed by the authorized person.
ii) Tender validity is shorter than required period.
iii) Required EMD (amount, validity etc.)/exemption documents have not been provided before tender opening.
iv) Goods offered are not meeting the tender enquiry specification.
v) Bidder has not agreed to other essential condition(s) especially incorporated in the tender enquiry like terms of payments, liquidated damages clause, warranty clause.
vi) Poor/unsatisfactory past performance.

(SURESH KUMAR)
Deputy Secretary
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vii) Bidders who stand de-registered by NSIC /banned/blacklisted by any government authority.
viii) Bidder has not quoted for entire quantity as specified in the list of requirements in the quoted Annexure.
ix) Bidders have not signed Integrity Pact as Appendix 9 of OTE.
x) If the Bidder does not submit duly signed Appendix 14of OTE
xi) If the Bidder does not agree to the delivery period as mentioned in OTE
xii) The Bidder in any manner discloses directly or indirectly the price bid in the Technical Bid

5. Qualification criteria (Tenderer to submit supporting documents to establish the following criteria)

i) The Bidder should have successfully completed same/similar IT& Networking based Turnkey Projects with any Central/State Govt organizations/CPSUs in India, aggregating Rs 100 Cr in last 5 years, including at least one project essentially having 'Command Control System' with a worth of at least Rs 20 Cr. The bidder should submit copies of work orders and certificates for successful completion of the above works/projects from the concerned organizations. Regarding experience of one project essentially having 'Command Control System', the certificate for successful completion of the work/project from the concerned organization should clearly mention about 'Command Control System' defining the said work/project.

ii) ii) The Bidder should have average annual turnover of **Rs. 50 crore** during the period of last 3 years i.e., 2016-17, 2017-18& 2018-19 to meet the obligation under contract. They should submit Audited Balance Sheet and Profit & Loss account for last **03 years** duly authenticated by a Chartered Accountant/Cost Accountant in India.

iii) The Bidder should not have suffered any financial loss (reflected in Profit & Loss Account) during the last three years i.e., 2016-17, 2017-18& 2018-19.

Note: Supporting documents submitted by the bidder must be certified as follows:

i) All copy of supply/work order; respective completion certificate and contact details of clients; documents issued by the relevant Industries Department/National Small Industries Corporation (NSIC)/manufacturing licence; annual report, etc., in support of experience, past performance and capacity/capability should be authenticated by the by the person authorised to sign the tender on behalf of the bidder. Original Documents must be submitted for inspection, if so demanded.

ii) All financial standing data should be certified by certified accountants, for example, Chartered Accountants/Cost Accountants or equivalent in relevant countries; and Indian bidder or Indian counterparts of foreign bidders should furnish their Permanent Account Number.

6. <u>Price and Evaluation Criteria:</u>

6.1 **<u>PRICE</u>**: The prices quoted should be on firm and fixed basis and shall include all elements of prices. The bidders / tenders will not be allowed to make any variations in the price bid or any amendments to commercial offers already uploaded online during the currency of tender and after the date of opening of the tender. Tenders where prices are quoted in any other way shall be treated as non-responsive and rejected.

6.1.1 Buy Back Clause:

Bidders have to provide Buy Back offer price in lump sum amount as per the format provided in the Price bid. The items under Buy Back will be sold "as is where is" basis and price once reflected in the Financial Bid cannot be withdrawn by the bidder.

All bidders are expected to inspect all items (electronic, electrical, mechanical, wooden, civil, construction material, etc. as available onsite) of Buy Back Option, during their visit to the site on the days as mentioned in Tender Notice on Page 3. For the purpose of fixing appointment for site visit during these days, Bidders can contact Shri Ashish Kumar Singh, Under Secretary (DM) on his mobile No. **09013785901** & Office No. 011-23438103 and email id ashish.singh@nic.in.

All items onsite of Buy Back Option will have to be dismantled, collected and transported by the selected bidder at their cost under their ownership and responsibility for the purpose of insurance (if any) and disposal as per the guidelines of Govt of India, within 10 days from the date of Acceptance of Work Order by the selected bidder. If not transported within the time limit, MHA will not be responsible for any kind of damage or any matter arising out of it whatsoever.

Bids received without Buy Back in the Price Bid will be considered non-responsive bid and will be liable for rejection.

The lowest (L-1) bidder will be selected from the consolidated total price quoted for the supply all items as a whole diminished by price quoted for Buy Back of the article, as mentioned in Price Bid format at Appendix-10.

6.2 **EVALUATION CRITERIA**: The broad guidelines for evaluation of Bids will be as follows:

a. Only those Bids will be evaluated which are found to be fulfilling all the eligibility and qualifying requirements of the Tender documents and are acceptable both technically and commercially (called substantially responsive bid).

b. The technical Bids forwarded by the Bidders will be evaluated by the Buyer with reference to the technical characteristics of the equipment as mentioned in the Tender enquiry. The compliance of Technical Bids would be determined on the basis of the parameters specified in the tender document.**The purchaser may waive any minor infirmity or non-conformity or irregularity in a bid which does not constitute a material deviation on the recommendation of Tender Evaluation Committee, provided such waiver does not prejudice or affect the relative ranking of any bidder.** The Price Bids of only those Bidders will be opened whose Technical Bids would clear the technical evaluation.

c. The Lowest price (L-1) will be decided on the basis of total cash outgo including price quoted by the particular bidder inclusive of all applicable levies/duties/taxes etc. for delivery, installation /commissioning & testing of stores at destination i.e. (**Consignee's Location**) and **CAMC Charges to be discounted as per** Discounted Cash Flow (DCF) method to Net Present Value (NPV) as appropriate for comparing the tender on an equitable basis. Bidder shall quote rates separately for 3 years of Comprehensive Annual Maintenance Contract (CAMC) in price bid after warranty period. The Buyer

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reserves the right to evaluate the offers received by adopting Discounted Cash Flow (NPV) method with a discounting rate of 7%.

- The formula is to be used for calculating NPV is as under:

$$NPV = \frac{\Sigma A_n}{(1+i)^t}$$

Where,

NPV = Net Present Value
A = Expected cash flow for the period mentioned by the subscript
i = Rate of interest or discounting factor which has been determined to be as per the Min. of Finance, GoI
t = The period after which payment is done
n = Payment schedule as per the payment terms and conditions

d. The bidders are required to spell out the rates of GST etc. in unambiguous terms. Otherwise their offers will be loaded with the maximum rates of duties and taxes for the purpose of comparison of prices. No custom duty exemption certificate (CDEC) will be provided. Price Format is available at **Appendix- 10** of OTE.

e. The tenderer should indicate tentative duties and taxes in the proforma as applicable on the date of opening of technical bids. However, reimbursement towards duties and taxes shall be made as per actuals and statutory variations in taxes and duties shall be allowed during the original delivery period as agreed in terms of the Contract. The Purchaser shall get the benefit if duties and taxes get reduced and pay extra if they increase. However, the variations shall not apply to any duties or taxes on the raw material.

f. The Purchaser will not be liable to any claim on account of fresh imposition and / or increase of statutory duties or taxes on the raw materials and / or components used directly in the manufacture of the contracted stores taking place during the pendency of the contract.

g. If Purchaser is required by Indian Law to deduct or withhold any other taxes or other amounts, the gross amount payable by Purchaser shall be paid after making such deductions or other withholdings. Necessary certificate regarding the deductions so made will be issued by the Purchaser.

h. If the Purchaser finds the duties and taxes are mentioned incorrectly, the Purchaser reserves the right to change it to the values considered appropriate and the price quoted by the tenderer shall be adjusted accordingly. If the Purchaser feels that the duties were mentioned incorrectly to gain unfair advantage the tender shall be liable to be rejected.

i. 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 will prevail and the total price will be corrected. If there is a discrepancy between words and figures, the amount in words will prevail for calculation of price.

j. The Lowest Acceptable Bid will be considered further for placement of contract / Supply Order after complete clarification and reasonableness of price as decided by the Buyer. The Buyer will have the right to award contracts to different Bidders for being lowest in particular items.

k. **Purchaser also reserve right to give purchase / price preference to small scale Industries of India under MSME Act 2006.**

l. Tender document is non-transferable.

m. The purchaser or his authorized representatives shall have the right to inspect the premises of the bidder, for verification of facts furnished by the bidder in support of his bid documents, and the bidder is bound to answer any query made by the purchaser.

7. Complete tender documents along with supporting documents as called for in the tender conditions, should be duly filled (wherever necessary) and signed in and are **SACROSANCT** and scanned copy of the same should be uploaded in the online mode for considering any offer as complete offer. All the tenderers are expected to go through every detail of the tender, provide all requisite details and documents/certificate, and tender documents duly complete in all respect and digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.

8. The conditions of contract, which will govern any contract made or entered into as a result of this tender process shall be as per the following guidelines–

(i) (General Financial Rule) GFR-2017
(ii) Manual for Procurement of Goods-2017
(iii) Any General and special conditions attached to this invitation to tender will also form part of the conditions.

9. Ministry of Home Affairs reserves the right at the time of award of contract to increase or decrease the quantity of goods originally specified in the tender documents without any change in unit price or other terms and conditions. This tender document and all terms and conditions, purchase order terms/special terms if mutually agreed will be form parts of total contract.

10. Ministry of Home Affairs reserves the right to increase or decrease the quantity at any stage.

11. **EARNEST MONEY DEPOSIT (EMD)**

(a) Bidder who is not registered with **NSIC or start-ups** as recognised by Department of Industrial Policy & Promotion (DIPP) for the 'IT and Networking Stores' or equivalent, for which the offers are being invited, are required to deposit **EARNEST MONEY** Rs. **50,00,000/-** (Rupees Fifty Lakhs only), failing which their offer will be summarily rejected.

(b) For claiming exemption from depositing earnest money, tenderer should be registered with **NSIC or recognised by DIPP as start-ups** for the **subject stores** for which the offers have been invited. Firms not registered for subject stores will be treated as unregistered and shall be required to deposit specified **Earnest Money.**

(c) EMD should remain valid for a period of **45 days beyond the period of offer validity** and can be deposited in **any one** of the following alternate forms:-

(i) A **Fixed Deposit Receipt (FDR)** in favour of **JS(DM),DM Division, MHA New Delhi** from any of the schedule commercial banks.

OR

(सुरेश कुमार)
(SURESH KUMAR)
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(ii) An irrevocable **Bank Guarantee (BG)** in the name of JS(DM), **DM Division, MHA, 3rd Floor, NDCC-II Building, Jai Singh Road** New Delhi -01 of any schedule commercial banks as per format at **Appendix-7** of GTE.

(iii) Original EMD documents should be sent/deposited directly to Joint Secretary, **DM Division, MHA, NDCC-II Building, Jai Singh Road, New Delhi – 110001 on or before 23/10/2019 at 02.00 PM and scanned copy of the same should be uploaded along with other tender documents failing which their offer will be summarily rejected.**

(d) **Earnest Money will remain deposited with the purchaser for the prescribed period.** If the validity of the tender is extended, the validity of **EMD** document submitted by the tenderer shall also be suitably extended by the tenderer at par with validity of offer, failing which his tender, after the expiry of the aforesaid period shall not be considered by the Purchaser.

(e) No interest shall be payable by the purchaser on the **EM** deposited by tenderer.

(f) The **EM** deposited is liable to be forfeited if the tenderer withdraws or amends, impairs or arrogates from the tender in any respect within the period of validity of the tender.

(g) If the successful tenderer fails to furnish the performance security deposit as required in the contract within the stipulated period, the **Earnest Money** shall be liable to be forfeited by the purchaser.

(h) **EMD** of the unsuccessful tenderers shall be returned after decision of tenders.

(i) **Any tender received from firm which is not registered with NSIC for the tendered stores as on date of opening of tender and is not accompanied with required Earnest Money in prescribed form, is liable to be rejected. Registration with any other authority will not exempt the firm from depositing Earnest Money.**

(j) Public Sector Undertaking/State undertaking or Central/State owned companies are not exempted from the payment of Earnest Money unless registered with NSIC.

12. SYSTEM OF BIDDING: SINGLE STAGE IN TWO BID SYSTEM

Bidders will submit their techno-commercial bids and price bids online on the CPP Portal. The website also has user manuals with detailed guideline on enrolment and participation in the online bidding process. No conditional bid shall be allowed/accepted. .

12.1 **TECHNICAL BID** (first cover) should comprise **scanned copy** of the following:

i) **All Appendix- 1 to 15** along with supporting documents as called for in the tender conditions duly filled wherever necessary. All these appendices should be signed by authorised person to do so with authority letter.

ii) Earnest Money in the prescribed format only. **(Original EMD for Instrument be sent Offline)**

iii) Copy of NSIC registration certificate wherever applicable duly countersigned and authenticated.

iv) Copy of PAN Number, GST/ Income tax registration, service tax registration, excise registration or any other mandatory registration

v) True Copies of registration as Proprietorship, Partnership, Private or Public Limited Holdings (wherever applicable)

vi) Warranty / guarantee confirmation certificate.

vii) Details of bankers along with bank account, IFSC code and other details required for electronic transfers of payment

viii) Past performance details along with copies of orders / contracts awarded to the bidder

ix) OEM support certificates (wherever applicable)

x) Technical detail/ leaflets/ brochure / compliance statement on specifications of subject stores to confirm on the qualitative requirements. The tenderers will be required to specifically mention the availability of detail literature on each specification / QRs in the brochure or technical literature provided by the suppliers. Clause wise technical compliance shall be submitted with comment on deviations, if any.

xi) Any other relevant document / certificate which is required to be submitted by the firm in line with the requirement of the subject tender enquiry.

12.2 COMMERCIAL/PRICE BID (second cover):

Price should be quoted in second cover online only in prescribed format as per Appendix-10(Excel sheet as well as PDF format). Price bid in excel format should only be uploaded in 2nd cover. If bidder uploads price bid in PDF format along with technical bids/literature, the same will be rejected. The quoted rates must be valid for a period of 180 days from the date of opening of tender. The overall offer for the assignment and bidder(s) quoted price shall remain unchanged during the period of validity. If the bidder quoted the validity shorter than the required period, the same will be treated as unresponsive and it may be rejected. In case the tenderer withdraws, modifies or change his offer during the validity period, bid is liable to be rejected and the EMD shall be forfeited without assigning any reason thereof. The tenderer should also be ready to extend the validity, if required, without changing any terms, condition etc. of their original tender.

13. METHODOLOGY FOR OPENING OF THE TENDERS –

i) Only the technical bid shall be opened online on the date of tender opening. Price bids of only those firms will be considered for opening whose offer would meet all tender requirements and OTE specifications and has passed in all tender conditions and technical/ physical (including field trial) evaluation if required.

ii) After opening of price bids, ranking statement will be prepared item wise and the finalization of successful bidder(item wise)will be done on L-1 (the lowest price)taking basis (For foreign currency) it will be with reference to exchange rate prevailed as on the date of opening of tender enquiry.

14. Any change in Address/ Telephone/ Fax/ e-mail should be immediately informed. The state of non-communication by the firm will make the offer liable for rejection.

15. Clarification regarding contents of the bids – During the course of evaluation process, the purchasing authority, shall at its discretion, ask the bidder for clarifications or confirmation on various aspects with reference to shortcomings or deficiencies so noticed in their bids. The request for such clarification or confirmations shall be given in writing to which the bidder will be required to send in their response within the time frame so prescribed in such written communications. The clarifications / confirmations shall be called only in respect of general

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conditions or requirements of the tender enquiry documents and not on any aspect pertaining to specifications or prices or other essential requirements of tender schedule.

16. **No post bid clarification or alteration or modification on the initiative of the bidder will be entertained.**

17. **Government Regulations –**
It shall also be confirmed by the Bidder that, there are no Government restrictions in the country of the supplier or countries from which sub-components are being procured and /or the export of any part of the system being supplied. Bidder shall provide certificate/undertaking to this effect.

18. **Integrity pact / Rejection of bids** – If the bidders does not agree with the terms and conditions of Integrity pact placed at Appendix 9 of OTE, their offer will be summarily rejected. Contract with successful bidders will also be cancelled if they does not fulfil the terms and conditions of the Integrity pact during the currency of the contract or till contractual obligation period and their Earnest Money Deposit and Performance Security Deposit will be forfeited. Canvassing by the bidder in any form, unsolicited letter and post tender corrections would invoke summary rejection with forfeiture of EMD and PSD.

18.1 Independent External Monitors (IEMs):

(i). The BUYER has appointed Independent External Monitors (hereafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).

a) Shri Vivek Rae, IAS (Retd.),
Ex-Secretary, M&NG, Government of India.
171 Gulmohar Enclave, New Delhi-110049
Mobile : 9871412828 Res.: 01126950724

b) Smt. Anita Chaudhury, IAS (Retd.),
Ex-Secretary, D/o Land Resources, M/o Rural Development,
Government of India,
Block-T, 28/11, DLF-III, Gurgaon,
Haryana- 122002
Mobiole : 9899111169, Residential : 01244046619

(ii) The task of the monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

(iii) The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

(iv) Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

(v) As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

(vi) The BIDDER(s) accepts that the monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIODDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIODDER/Subcontractor(s) with confidentiality.

(vii) The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

(viii) The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER/BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

(ix) Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment or commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

(x) Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat the BUYER.

(xi) Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that my follow in accordance with the provisions of the extant law in force relating to civil or criminal proceedings.

(xii). Validity

The validity of this Integrity Pact shall be from date of its signing and extend up years or the complete execution of the contract to the satisfaction of both the Buyer

19. **Modifications and withdrawal of bids** – A bidder may modify or withdraw his bid online after submission but prior to final date of submission of tenders/date of opening of tenders. In case a supplier modifies or amends a bid already submitted online, the latest version of the bid will be accepted.

20. **Legal constitution of firm:-** Any individual signing the tender (or holding digital signature certificate) shall specify whether signatory is signing as

i) Sole proprietor;
ii) Director/Secretary of company or authorised by board of Directors.

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21. Payment authority –

The payment authority will be the **Pay & Account Officer, MHA, New Delhi.**-110001.

22. Compliance statement for specifications / QRs –

i) The technical details of the models offered along with the supporting original technical Literature, leaflets, brochures etc. will be submitted. The confirmation of the models(s) offered with the T/E specification and the deviation(s), if any will be clearly mentioned in the technical bids.

ii) Bidders are required to furnish clause by clause compliance of specification bringing out clearly deviation from specification, if any. **The firms are advised to submit the compliance statement in the format given at Appendix 4 along with technical bid failing which their offer will be treated as incomplete and are liable to be ignored.**

23. Bidders will be fully responsible for supply, proper installation, onsite demonstration, commissioning, training and making the equipment functional before final settlement of the account.

24. The Bidders will also provide complete technical/ operating and service manual of the equipment.

25. Pre–installation requirement of equipment should be mentioned by the bidder at the time of submitting the bid.

26 The Bidders should ensure that the entire Bid Documents should have a continuous set of serial No. with proper index.

27. The decision of the purchaser shall be final as to the quality of the stores and shall be binding upon the tenderers and in case of any of the articles supplied not being found as per specification shall be liable to be rejected or replaced and any expenses or losses caused to the suppliers should be borne by the supplier and ensured by the supplier that articles supplied should be of standard specifications and free from all defects. The acceptance of articles will be made only when the articles are inspected and found up to the standard specifications and free from all defects. The rejected items must be removed by the tenderers from the consignee's premises within 15 days from the date of the information about rejection. **The Buyer** will take reasonable view of such materials but in no case shall be responsible for any loss, shortage, damage that may occur to it while it is in the premises of the consignee.

28. INSTRUCTIONS FOR ONLINE BID SUBMISSION: Instructions to the Bidders to submit the bids online through the Central Public Procurement Portal for e-Procurement are at **https://eprocure.gov.in/eprocure/app** The bidders must carefully follow the instructions.

i) Possession of valid Digital Signature Certificate (DSC) and enrolment/registration of the contractors/bidders on the e-procurement/e-tender portal is a prerequisite for e-tendering.

ii) Bidder should do the enrolment in the e-Procurement site using the "Click here to Enroll" option available on the home page. Portal enrolment is generally free of charge. During enrolment/registration, the bidders should provide the correct/true information including valid

e-mail-id. All the correspondence shall be made directly with the contractors/bidders through e-mail-id provided.

iii) Bidder need to login to the site through their user ID/ password chosen during enrolment/registration.

iv) Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by NIC ,SIFY/TCS/ nCode / mudra or any Certifying Authority recognized by CCA India on e-Token / Smart Card, should be registered.

v) The DSC that is registered only should be used by the bidder and should ensure safety of the same.

vi) Contractor/Bidder may go through the tenders published on the site and download the required tender documents/Annexures for the tenders he/she is interested.

vii) After downloading / getting the tender document/ Annexures/ Appendices, the Bidder should go through them carefully and then submit the documents as asked, otherwise bid will be rejected.

viii) If there are any clarifications, this may be obtained online through the tender site, or through the contact details. Bidder should take into account the corrigendum published before submitting the bids online.

ix) Bidder then logs in to the site through the secured log in by giving the user id/ password chosen during enrolment/registration and then by giving the password of the e-Token/ Smart Card to access DSC.

x) Bidder selects the tender which he/she is interested in by using the search option & then moves it to the 'my tenders' folder.

xi) From my tender folder, he selects the tender to view all the details indicated.

xii) It is construed that the bidder has read all the terms and conditions before submitting their offer. Bidder should go through the tender Annexures and appendices carefully and upload the documents as asked; otherwise, the bid will be rejected.

xiii) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/ Annexure and generally, they can be in PDF/xls /rar /zip/dwf formats. If there is more than one document, they can be clubbed together and can be provided in the requested format. Each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same can be uploaded, if permitted. Bidders Bid documents may be scanned with 100 dpi with black and white option. However if the file size is less than 1 MB the transaction uploading time will be very fast.

xiv) Bidder should take into account the corrigendum published from time to time before submitting the online bids.

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xv) The Bidders can update well in advance, the documents such as certificates, annual report details etc., under **My Space option** and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.

xvi) Bidder should submit the EMD as specified in the tender. **The original should be posted/couriered/given in person to the Tender Inviting Authority, within the bid submission due date & time for the tender. Scanned copy of the instrument should be uploaded as part of the offer.**

xvii) While submitting the bids online, the bidder reads the terms & conditions and accepts the same to proceed further to submit the bid packets.

xviii) The bidder has to select the payment option as offline to pay the EMD as applicable and enter details of the instruments.

xix) The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise submitted bid will not be acceptable.

xx) The bidder has to digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.

xxi) The bidder has to upload the relevant files required as indicated in the covered content. In case of any irrelevant files, the bid will be rejected.

xxii) If the price bid format is provided in a spread sheet file like BoQ_ICR-ER.xls, the rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The Price Bid/ BOQ template must not be modified/replaced by the bidder, else the bid submitted is liable to be rejected for this tender.

xxiii) The bidders are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.

xxiv) After the bid submission (i.e. after Clicking "Freeze Bid Submission" in the portal), the acknowledgement number, given by the system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and will also act as an entry pass to participate in the bid opening date.

xxv) The time settings fixed in the server side & displayed at the top of the tender site, will be valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system. The bidders should follow this time during bid submission.

xxvi) All the data being entered by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered will not viewable by unauthorized persons during bid submission & not be viewable by any one until the time of bid opening.

xxvii) Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

xxviii) The confidentiality of the bids is maintained since the secured Socket Layer 128 bit encryption technology is used. Data storage encryption of sensitive fields is done.

xxix) The bidder should logout of the tendering system using the normal logout option available at the top right hand corner and not by selecting the (X) exit option in the browser.

xxx) Any queries relating to NIT document and the terms and conditions contained therein should be addressed to the Under Secretary, DM Division, MHA, NDCC-II Building, Jai Singh Road, New Delhi or **Email: ashish.singh@nic.in** (Tele No. **011-23438103 fax No. 011-23438098**)

xxxi) For any queries relating to operation of the Central Public Procurement Portal (CPP Portal) bidders are asked to contact over phone: 24x7 Help Desk Number 120-4200462, 0120-4001002 or email : **support-eproc@nic.in**

(Suresh Kumar)
Deputy Secretary to the Government of India
For and on behalf of the President of India

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उप सचिव
Deputy Secretary
गृह मंत्रालय
Ministry of Home Affairs
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

ANNEXURE - III

GENERAL CONDITIONS OF TENDER ENQUIRY

1. All tenderers should visit and inspect the site to understand scope of Civil/PH/Electrical/HVAC, Computer Systems, Network components, Video walls, Furniture etc. works since it is modifications to existing building. The Building materials shall be used for Civil/PH/Electrical/AC works as per the list of approved /preferred makes with prior approval.

2. **Packing:** The supplier will ensure that the stores are securely packed to avoid damage in transit by sea/air/rail/road occasioned by any defect in packing and shipping documents should also show the name of the ultimate consignee. The supplier shall insert in each case packing list fully item-wise to show the case number, contents, gross and net weight and cubic measurement and dimensions. Four copies of each packing list shall be supplied to the Forwarding Agent.

3. **Marking:** Each case shall have shipping marks stenciled on two opposite side and on the top. In addition, the gross weight/net weight and cubic measurements should also be indicated on the packages. The marks shall also be shown on invoices, packing lists and on rail/road Bills of lading or mailing certificates exactly as they appear on the cases.

3. **Levies:** The quoted price should be strictly as per BOQ format clearly indicating quantum of levies/duties and taxes with agency commission if any and no claim for the same at later stage will be entertained.

4. **Insurance:** Price offered by the bidder will be inclusive of all insurance charges payable till delivery of stores at consignee location, its installation and commissioning of the store.

5. **Risk Purchase:** In the event of a contract being cancelled for any breach committed and the purchaser effecting re-purchase of the stores at the risk and the cost of the contractor, the purchaser is not bound to accept the lower offer of Benami or allied or sister concern of the contractor.

6. **Liquidated Damages (LD):**

   (i) If the contractor fails to deliver the stores or any instalment thereof within the period fixed for such delivery or at any time repudiates the contract before the expiring of such period the purchaser will recover from the contractor liquidity damages including administrative expenses and not by way of penalty a sum equivalent to *0.5 (*Half)% of the price of any portion of stores delivered late/***quantum of work in execution of Civil/Electrical/HVAC /other ICR-ER works/ Services**, for each week or part thereof of delay provided that the total damages so claimed shall not exceed 10% of the total contract price.

   (ii) While granting extension of the delivery period, where the delivery of stores or any instalment thereof is accepted after the expiry of the original delivery period, the purchaser will recover from the contractor, as agreed, liquidity damages a sum equivalent to *0.5 (*Half)% of the price of any portion of stores delivered late, for each week or part thereof of delay provided that the total damages so claimed shall not exceed 10% (Ten) of the value of delayed goods.

(iii) In case of any defects in supply or manufacturing **or *in execution of Civil/Electrical/HVAC works, Computer Systems, Network components, Video walls, Furniture etc.*** not conforming to technical specifications, observed during survey at consignee's locations or later during the warranty period, seller will be liable to replace the defective store at their cost.

(iv) Any amount which becomes due and recoverable from the Contractor on account of liquidated damages relating to this contract shall also be recoverable from any sum that is due or any sum thereafter may become due to the contractor out of this contract or any valid contract with the MHA.

(iv) The PBG shall be en-cashed to the extent of LD amount, if the same is not paid within the time period specified in the notice for recovery of LD. Where the bank guarantees have been en-cashed partially, the contractor on such occasions shall restore the en-cashed guarantees to the full amount. Any failure to do so shall amount to violation of the terms and conditions of the project. Without prejudice to its rights of any other remedy, purchaser may en-cash Bank Guarantee (PBG) in case of any breach in terms and conditions of the project by the Contractor.

7. **Defective store:** In case of any defects in supply or manufacturing or workmanship, observed during survey at consignee location or later during the warranty period, the tenderer will be liable to replace the defective store at the cost of supplier. The purchase proceed to take remedial action as may be necessary at the supplier's risk and expense and without any prejudice to any other right which the purchase may have under the contract.

8. **Performance Security:** As per Rule 171 of GFR 2017 successful tenderer will have to submit performance bond @ 10% of order value within **30 days** of issue of contract for due performance of the contract valid beyond 60 days of warrantee/Guarantee period in shape of the Fixed Deposit Reciept/ Bank Guarantee from Commercial bank in the required proforma. The performance guarantee will come into force after the installation. Firm, on their own will have to direct their bankers to extend the performance bond to be valid till warranty/guarantee period. Where the performance bank guarantee is obtained by a foreign bank, it shall be got confirmed by a scheduled Indian Bank and shall be governed by Indian Laws and be subject to the jurisdiction of courts of the place of issue of Acceptance of Tender (A/T). The Performance Security Deposity furnished by the successful bidder(s) will be forfeited if they does not perform with respect to terms and condition of the contract and also with respect to terms and condition in the Integrity pact **(Appendix-9 of this TE).** Successful tenderer **will also have to submit Separate performance bond @ 10% order value for CAMC contract as the case may if ordered by enduser in later stage.**

9. **Performance Statement:** Tenderers should submit their performance statement in the enclosed proforma at **Appendix-6** of Tender Enquiry. The decision on the assessment of the past performance of the tenderer by the purchaser is final. Foreign suppliers should also submit certificate / report from the chamber of commerce of country of origin of the manufacturers indicating the technical, production and financial capability etc. of the manufacturer. In case, it is found that information furnished is incomplete or incorrect, their tender will be liable to be ignored.

10. **Dispute Resolution**: When a dispute/difference arises, both the purchaser and supplier should first try to resolve it amicably by mutual consultation. If the parties fail to resolve the dispute then, depending on the position of the case, either the purchaser or supplier should give notice

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गृह मंत्रालय
Ministry of Home Affairs

to the other party of its intention to commence arbitration. The following Arbitration clause will form part of the contract placed on successful Bidder.

11. **ARBITRATION**:

a) In the event of any question, dispute or difference arising under these conditions of contract, or in connection with this contract (except as to any maters the decision of which is specially provided for by these conditions) the same shall be referred to the sole arbitrator to be appointed by the Secretary, MHA, UOI, New Delhi. It will be no objection that the arbitrator is a Government Servant that he had to deal with the matters to which the contract relates or that in the course of his duties as a Government servant he has expressed views on all or any of the matters in dispute or difference. The award of the arbitrator shall be final and binding on the parties to this contract.

b) In the event of the Arbitrator dying, neglecting or refusing to act or resigning or being unable to act for any reason, on his award being set aside by the court for any reason, shall be lawful for the Secretary, MHA, UOI, New Delhi to appoint another arbitrator in place of the outgoing arbitrator in the manner aforesaid.

c) It is further a term of this contract that no person other than the person appointed by the Secretary, MHA, UOI, New Delhi as aforesaid should act as arbitrator and that, if for any reason that is not possible, the matter is not to be referred to Arbitration at all.

d) The arbitrator may from time to time with the consent of all the parties to the contract enlarge the time for making the award.

e) Upon every and any such reference, the assessment of the costs incidental to the reference and award respectively shall be in the discretion of the arbitrator.

f) Arbitration shall be held in New Delhi, India or such other place as the Home Secretary at his discretion may determine and conducted in accordance with the provision of Arbitration and Conciliation Act, 1996 or any statutory modification or re-enactment thereof. In this clause, the expression 'Home Secretary' includes if there be no Secretary or if Secretary is on leave or is absent from duty or is not available for any reason whatsoever, the officer who is looking after the current duties of Secretary whether in addition to other function or otherwise.

g) Incase tenderers do not agree to Arbitration clause as mentioned in the tender enquiry, they may opt for settlement through court in New Delhi, India. Jurisdiction of the court as a result of this tender invitation will be the place from which the contract is issued i.e. New Delhi.

12. **PENALTY FOR USE OF UNDUE INFLUENCE**

The Seller should undertake that he has not given, offered or promised to give directly or indirectly any gift, consideration, reward, commission, fees brokerage of inducement to any person in service of the Purchaser or otherwise in procuring, the Contracts or for bearing to do or for having done or forborne to do any act in relation to obtaining or execution of the Contract or any other Contract with the Government for showing or forbearing to show favour or dis-favour to any person in relation to the Contract or any other Contract with the Government. Any breach of the aforesaid undertaking by the seller or any one employed by him or acting on his behalf (whether with or without the knowledge of the seller) or the commission of any offers by the seller or any one employed by him or acting on his behalf, as defined in Chapter IX of the Indian Penal Code, 1860 or the Prevention of Corruption Act, 1947 or any other Act enacted for the prevention of corruption shall entitle the Purchaser to cancel the contract and all or any other contracts with the seller and recover from the seller the amount of any loss arising from such cancellation. A decision of the Purchaser or his nominee to the effect that a breach of the undertaking had been

committed shall be final and binding on the seller. Giving or offering of any gift, bribe or inducement or any attempt at any such act on behalf of the seller towards any officer/employee of the Purchaser or to any other person in a position to influence any officer/employee of the Purchaser for showing any favour in relation to this or any other contract, shall render the Seller or such liability/penalty as the Purchaser may deem proper including but not limited to termination of the contract, imposition of penalty damages, forfeiture of the Bank Guarantee and refund of the amounts paid by the Purchaser.

13. **PATENT AND OTHER INDUSTRIAL/INTELLECTUAL PROPERTY RIGHT**

The prices quoted in the present tender shall be deemed to include all amounts payable for the use of patents, copyright, registration charges, trademarks and payment for any other industrial property rights. The tenderer shall indemnify the Purchaser against all claims from a third party at any time on account of the infringement of any or all the rights mentioned in the previous paragraphs, whether such claims arise in respect of manufacture or the use. The tenderer shall be responsible for the completion of the supplies, irrespective of the fact of infringement of any or all the rights mentioned above.

14. **TRANSFER AND SUB-LETTING**

The tenderer has no right to give, bargain, sell, assign or sublet or otherwise dispose of the resultant contract or any part thereof, as well as to give or to let a third party take benefit or advantage of the resultant contract or any part thereof.

15. Purchaser reserves the right to change the number of the consignees and change the quantity of stores allotted to them.

16. Purchaser reserves the right to get the manufacturing capacity of all firms re-verified irrespective of the registration status.

17. Purchaser reserves the right to cancel/reject or Scrap any or all the tenders without assigning any reason.

18. **FORCE MAJEURE CLAUSE**

If at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract shall be prevented or delayed by reason of any war, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts or act of God (hereinafter referred to "events") provided, notice of the happening of any such event is given by either party to the other within **21 days** from the date of occurrence thereof, neither party shall by reason of such event, be entitled to terminate this contract nor shall either party have any claim for damages against the other in respect of such non-performance or delay in performance, and deliveries under the contract. The contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist, and the decision of the Purchaser as to whether the deliveries have been so resumed or not, shall be final and conclusive, PROVIDED FURTHER that if the performance in whole or part or any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 60 days, either party may at its option terminate the contract provided also that if the contract is terminated under this clause, the purchaser shall be at liberty to take over from the contractor at a price to be fixed by the Purchaser, which shall be final, all unused, undamaged and acceptable materials, bought out components and stores in course of manufacture in the possession of the contractor at the time of such termination or such portion thereof as the purchaser may deem fit

excepting such materials, bought out components and stores as the contractor may with the concurrence of the purchaser elect to retain.

19. **TERMINATION OF CONTRACT**

The Purchaser shall have the right to terminate this Contract without any notice in part or in whole in any of the following cases:

a) The delivery of the material is delayed for causes not attributable to **Force Majeure** after the scheduled date of delivery.
b) The Seller is declared bankrupt or becomes insolvent.
c) The delivery material is delayed due to causes of **Force Majeure** by more than 15 days.
d) In case Performance Security is not furnished within 30 days from the date of issuing of A.T.

20. **GOVERNMENT REGULATIONS**

It shall also be confirmed that, there are no Govt. restrictions or limitation in the country of the supplier or countries from which sub-components are being procured and/or for the export of any part of the system being supplied. Suppliers/Contractors shall provide a certificate to this effect.

21. **FRANKING CLAUSE**– The following Franking clause will form part of the contract placed on successful Bidder –

a. Franking Clause in the case of **Acceptance** of Goods "The fact that the goods have been inspected after the delivery period and passed by the Inspecting Officer will not have the effect of keeping the contract alive. The goods are being passed without prejudice to the rights of the Buyer under the terms and conditions of the contract".

b. Franking Clause in the case of **Rejection** of Goods "The fact that the goods have been inspected after the delivery period and rejected by the Inspecting Officer will not bind the Buyer in any manner. The goods are being rejected without prejudice to the rights of the Buyer under the terms and conditions of the contract."

22. **Risk Purchase Clause:**

(i) In the event of failure of supplier to deliver or dispatch the stores or provide the required services within the stipulated dates/period of the supply order /AT, or in the event of breach of any of the terms and condition of the AT, the purchaser will have the right to purchase the subject store elsewhere at the risk and cost of defaulting supplier after giving a notice to defaulting supplier. The cost as per Risk Purchase exercise may be recovered from the bills pending with the supplier even against any other supplies outside this contract or even from the pending bills with any other Govt. Department/Ministry.

(ii) In the event of contract being cancelled for any breach committed and the purchaser effecting re-purchase of the subject store at the risk and cost of contractor, the purchaser is not bound to accept the lower offer of Benami or allied sister concern of the contractor.

23. Any information furnished by the bidder in support of their eligibility of tender conditions, past performance, registration status with concerned Government Agency, false certification of Make In India and all other relevant to the tender find fake, incorrect or fraudulent, then the bidder will be liable for forfeiture of EMD, Security Deposit, cancellation of contract and further Debarment from MHA as well as other Central Government Department's tender and other legal recourse thereof.

(Suresh Kumar)
Deputy Secretary to the Government of India
For and on behalf of the President of India

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ANNEXURE –IV

SPECIAL CONDITIONS OF THE TENDER ENQUIRY

1. Delivery Period and terms of Delivery –

1.1 Deliverables and Timelines

DELIVERABLES	TIMELINES
Event: Supply, Installation & Commissioning of All the Items **Delivery period for supply of items.** ** Please note that Contract can be cancelled unilaterally by the Buyer in case items are not received within the contracted delivery period.	***180*** days from the **date of contract**

1.2 **Terms of Delivery – FOR destination**. The Seller will deliver the stores at **consignee's locations i.e. :- a) NDCC-II building, New Delhi b)MHA - North Block, New Delhi c) NRSC Shadnagar (30 Km from Hyderabad Airport)** at seller's risk and cost including all charges at airport and customs.

2 **Extension of Time for Delivery**: -

2.1 As soon as it is apparent that delivery period stipulated in this contract cannot be adhered to and tenderer must forthwith send an application to **JS(DM),DM Division, MHA, 3rd Floor, NDCC-II Building, Jai Singh Road, New Delhi 110001** requesting for extension of delivery date with a copy thereof endorsed Indenter. This implies no commitment and is without prejudice to the purchaser's right. This is also without prejudice to the time being essence of the contract.

2.2 In case, if the site is not made available for installation of supplied items during the period of delivery and installation as given bidding document, then the bidder would request purchaser in writing accompanied by "Site Not Ready" certificate duly sealed and signed by the consignee for extension of installation period without liquidity damages penalty charges.

3 **Training after installation and commissioning** – The seller has to provide free of cost full on-site training (installation/demonstration/training) by company engineers, expert to the user satisfaction. Complete training of operation & preventive maintenance of system installation and customization of software for at least 30 days at user site should be provided for 30 persons. The Seller should provide appropriate brochures, technical literature, catalogues, tool kit, hard and soft copy of operation manual, software and other items where ever applicable from the manufacturer/principals (with signature and seal of the firm on brochures/literature) with equipment free of cost. The training schedule may be fixed with mutually agreeable date and time. The supplier also upgrade the software free of cost whenever such up-gradation occurs

4 **Inspection Methodology:** Joint Receipt Inspection of the stores shall be carried out by an inspecting authority / board so detailed by **Joint Secretary, DM Division, MHA, New Delhi-110 001,** he/ Indenter will also indicate the tentative date, time and place for such inspection.

4.1 JRI will consist of:-

4.1.1 Quantitative checking to verify that the quantities of the delivered goods correspond to the quantities defined in this contract as per the invoices.

4.1.2 Complete functional checking of the stores as per specifications in the tender and as per procedure and tests laid down by **The DM Division, MHA, New Delhi-110 003.**

4.1.3 If the tendered store is rejected during JRI as not confirming to Specifications, the same will be replaced if asked for.

4.2 Alternatively at purchaser's option, money will be refunded in foreign currency (for foreign vendors) positively within 30 days of issue of notice of such rejection. The consignee's right of rejection in this regard will be final and absolute

5 **(A) PAYMENT TERMS: -**
Pro - rata payment will be made against staggered deliveries/ completion of works:

Civil: 40% payment (of civil works component) against dismantling, structural work and receipt of other building materials. 50% payment against installation and finished items such as flooring, false flooring, painting, wall paneling, joinery etc.

Electrical and A/C: 75% payment (of Electrical and A/C component) against delivery of items/equipment. 15% payment (electrical and A/C component) against installation and testing of items/equipment

Computer Systems: 90% payment (of computer systems component) against delivery, installation, commissioning, training and acceptance.

Communication links: Quarterly payment.

Display devices: 90% payment (of display devices) against delivery, installation, commissioning, training and acceptance.

Furniture: 90% payment (Furniture component) against delivery, installation, commissioning, training and acceptance.

PBX-Call Centre: 90% payment (of PBX component) against delivery, installation, commissioning, training and acceptance.

10% balance payments against all the above works/deliveries and any other outstanding payment will be made after successful completion, installation, commissioning of the entire turnkey project and training.

(**B**). **MODE OF PAYMENT** All payments will be released electronically to the account of the firm who will be required to provide Banker details along with IFSC code and account number along with their bids to facilitate e-payments. Documents will include:

(a) Suppliers' invoice indicating, inter alia description and specification of goods/*works*, quantity, unit price, total value;

(b) Packing List

(c) Insurance certificate;

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(d) Railway receipt/consignment note;

(e) Manufacture's guarantee certificate and in-house inspection certificate.

(f) Inspection certificate issued by purchaser's inspector and

(g) Certificate of Conformity & Acceptance Test at PDI, if any.

(h) Consignee Receipt Certificate as per Appendix-12 in original issued by the authorised representative of the consignee.

Any other document (s) as and if required in terms of the contract.

8.1 **Period of Guarantee / Warranty**: **03years** from the date of successful installation/commissioning of equipment and training to the entire satisfaction of the Consignee. Performance Security Deposit will be returned to firm only after completion of warranty period and on certification from the user/consignee that there is no warranty claim against the firm.

8.2 **Bidder has to make provision for a Resident IT Engineer for onsite maintenance and upkeep of the IT system & Networking and to attend events of any system problems, failure, shutdown and malfunctioning on 24x7 basis during entire warranty period of the system.**

9. **COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC) CLAUSE:**

- The Seller would **provide** CAMC for a period of **03 years** which will commence after warranty period of 03 years with accessories, spares parts and consumables enabling en-user to enter into CAMC. The charges for the CAMC shall be quoted by the bidder for post warranty period. **The Rates quoted for CAMC will have impact on the status of L-1 firm (By DCF Method).** Successful tenderer **will also have to submit Separate 10% performance Gaurantee of order value for CAMC contract if ordered by enduser in later stage.**

- **Bidder has to make provision for Resident IT Engineers for onsite maintenance and upkeep of the IT system & Networking and to attend events of any system problems, failure, shutdown and malfunctioning on 24x7 basis during entire CAMC period of the system Site engineers for this period**
- **The following CAMC Clause will be form part of the contract placed on successful bidder:-**

The CAMC services would be provided in two distinct ways:

I. **Preventive Maintenance Service:** The Seller will provide a minimum of quarterly Preventive Maintenance Service visits during a year to the operating base to carry out functional check-ups, replacing consumables spares and minor adjustments/tuning as may be required.

II. **Breakdown maintenance Service:** In case of any breakdown of the equipments / system, on receiving a call from the buyer, the seller is to provide complete maintenance service and will replace the accessories, spares, consumables etc. to make the equipment/ system serviceable.

a. Response Time: The response time of the Seller should not exceed 06 hours from the time the breakdown intimation is provided by the user.

b. Serviceability of 100% per year is to be ensured. This amounts to total maximum downtime of 2 days per year. Also un-serviceability should not exceed 1 day at one time. Required spares to attain this serviceability may be stored at site by the Seller at his own cost. Total down time would

be calculated at the end of this year. If down time exceeds permitted downtime, LD would be applicable for the delayed period.

c. Maximum repair turnaround time for equipment/ system would be 2 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/ system.

d. Technical Documentation: All necessary changes in the documentation (Technical and Operator Manual) for changes carried out on hardware and software of the equipment will be provided.

e. During the CAMC period, the seller shall carry out all necessary servicing/ repairs to the / system under CAMC at the current location of the equipment/ system. Prior permission of the Buyer would be required in case certain components/ sub systems are to be shifted out of location. On such occasions, before taking over the goods or components, the Buyer may ask for suitable bank guarantee from seller to cover the estimated current value of item being taken.

f. Price charged by the maintenance contractor should not exceed the prevailing rates charged by him from other for similar services. While claiming payment, the contractor is also to give a certificate to this effect in his bill.

g. The purchaser reserves its right to terminate the maintenance contract at any after giving due notice without assigning. The contractor will not be entitled to claim any compensation against such termination. However, while terminating the contract, if any payment is due to the seller for maintenance services already performed in terms of the contract, the same would be paid to it as per the contract terms.

10. **Custom Duty:** If it is intended to ask for custom duty or any other charges extra the same must be stated in price bid. In absence of such stipulation it will be presumed that prices are inclusive of all such charges and no claim for the same will be entertained. The contract is for supply, installation and commissioning, and trainings. Hence the supplier is fully responsible for and should make his own arrangements for import, transport, transit insurance till safe arrival of entire goods to the consignee's premises, clearance of goods through customs, etc. He shall do so in his own name and not in the name of the purchaser. **No custom duty exemption certificate will be issued.** The tenderer should also indicate correctly the rate of custom duty applicable for the goods in question and the corresponding Indian customs tariff number.

11. Tenderers will be fully responsible for proper installation, testing and making the equipment functional before final settlement of account.

13. User License:- The supply of item should be with the required permanent licences ensuring that the validity of the license is permanent and all such cost toward this end shall be deemed to have been included in the bid price and no additional amount shall be payable by MHA, New Delhi. **The licence should be in favour of Joint Secretary (Disaster Management), DM Division, MHA, NDCC-II, Jai Singh Road, New Delhi-110 001 and will be property of CFSL, CBI, New Delhi.**

(SURESH KUMAR)
Deputy Secretary
Ministry of Home Affairs

14. ***The bidder should submit the copies of technical brochures/ literatures/ scheme etc. of Civil & PH works, electrical layout/ AC works schemes and equipment offered etc.. as part of Part I (Technical bid) of their offer.***

15. *The bidder shall consider all items required for successful completion and commissioning of the facility in their offer and submit the detailed list of the deliverables towards the same.*

(Suresh Kumar)
Deputy Secretary to the Government of India
For and on behalf of the President of India

Appendix - 1

OFFER FORM

Full name and address of the Tenderer in addition to post Box No., if any, should be quoted in all communications to this office

Contractor's Telegraphic Address / Telephone No. / FAX No. & E-mail Address

From:

TENDER NO.

Dear Sir,

I/We hereby offer to supply the stores/store i.e. .....detailed in the schedule hereto or such portion thereof as you may specify in the acceptance of Tender at the price given in the said schedule and agree to hold this offer open till_____, I/We shall be bound by a communication of acceptance within the prescribed time.

2. I/We have understood all the instructions to tenderer in the Tender Enquiry and have thoroughly examined the specification drawing and/or pattern quoted in the schedule hereto and am/are fully aware of the nature of the stores required and my/our offer is to supply stores strictly in accordance with the requirements.

3. The following pages from page No..... to Page No.....have been added to and will form the part of this tender _____.

Yours faithfully

(SIGNATURE OF TENDERER)
ADDRESS

DATED-

SIGNATURE OF WITNESS

ADDRESS
DATED

APPENDIX-2

Description of Articles indented

Preface - Important information to bidders

The Ministry of Home Affairs (MHA) proposes to establish an Integrated Control Room for Emergency Response (ICR-ER) in the national capital for handling natural disasters and emergency situations with situational awareness and strategic level monitoring. The comprehensive backend and control room infrastructure will primarily be located at NDCC II Towers, Jai Singh Marg, New Delhi with an a additional control room infrastructure in North Block, that serves as a front office to ICR-ER It is also planned to take up minor augmentation of the existing NDEM data centre at NRSC Shadnagar Campus near Hyderabad towards implementation of ICR-ER mirror site.

The computer systems infrastructure forms the major component in the planned ICR-ER. It is based on the state-of-the-art in IT (Information Technology) and comprises of servers, network mass storage, hyperconverged system, perimeter WAN links, multi-layered security, 10G LAN network, archival object storage, data protection/ tape library backup, and system/ management softwares. In addition to ISP links for Internet connectivity, leased lines are also envisaged to connect NDCC-II Building with North Block and NRSC Shadnagar Data Centre. The 24x7 server room (data centre) infrastructure is primarily located in NDCC-II Building.
A helpline facility is crucial for control centre operations and hence the ICR-ER design includes a modern IP PBX & Contact Centre system with necessary appliances, end devices and softwares. Similarly, the control rooms are to be equipped with the latest video wall and video conference systems.Two control rooms each are contemplated at the NDCC-II Building and North Block for a total of 4 control rooms. There is no immediate plan for a control room at NRSC, Shadnagar.The above core infrastructure is required to be positioned in the existing premises at NDCC II Building and North Block. Therefore, minor civil & electrical works execution is a prerequisite work component to be completed in time before the systems infrastructure installation. These works include dismantling/ removal/ replacement of the existing partitions, flooring, false ceiling, UPS, Precision AC, Comfort AC, structured cabling of electrical & network cables, provision of power/ network sockets, light fittings, etc. The civil works and furniture requirements are required for the NDCC-II Building and North Block, but not at NRSC, Shadnagar.

The server room, located in NDCC-II Building, is a 24x7 data centre facility with about 18 server/ storage/ network racks, that needs to be supported with Precision AC, UPS and DG. The rest of the rooms in NDCC and North Block are to be provided with Comfort AC, UPS and DG. At NDCC-II, the UPS and DG has to be provided by the bidder. At North Block, the existing UPS and DG facility could be leveraged and integrated for ICR-ER.

For the server room in NDCC-II as well as other rooms in NDCC-II and North Block, suitable electrical (SEB, UPS), telephone and data network cables with conduits/ trenches/ trays must be laid out to the points of actual equipment usage along with IO socket terminations.
In addition to the civil works, new furniture needs to be suitably positioned in the various functional spaces like control rooms, VIP Interaction room, conference rooms, etc.

For bidders to get a clear understanding of the project requirements and works involved, a number of schematic diagrams depicting the layout plans and infrastructure positioning are given below:

Table 1. List of important figures of layout plans & diagrams

SNo	Figure	Description
1	Figure i	Overall system & network architecture of ICR-ER
2	Figure ii	ICR-ER in NDCC-II Building - rooms layout plan with dimensions
3	Figure iii	ICR-ER in North Block - rooms layout plan with dimensions
4	Figure iv	ICR-ER in NDCC-II Building - positioning of equipments, furniture and power/ network sockets in rooms
5	Figure v	ICR-ER in North Block - positioning of equipments, furniture and power/ network sockets in rooms
6	Figure iv	Server room racks details
7	Figure vii	ICR-ER WAN links details

It is proposed to implement the above mentioned works as a turnkey project by a competent system integrator selected via single consolidated tender basis. The selected vendor is responsible for 3 year onsite warranty support followed by 3 more years of AMC. The warranty & maintenance support includes comprehensive facility management by the vendor with onsite technical engineer support services.

The detailed technical specifications for the equipments and services expected from the vendor are categorized under several functional subsystems and provided in the table below.

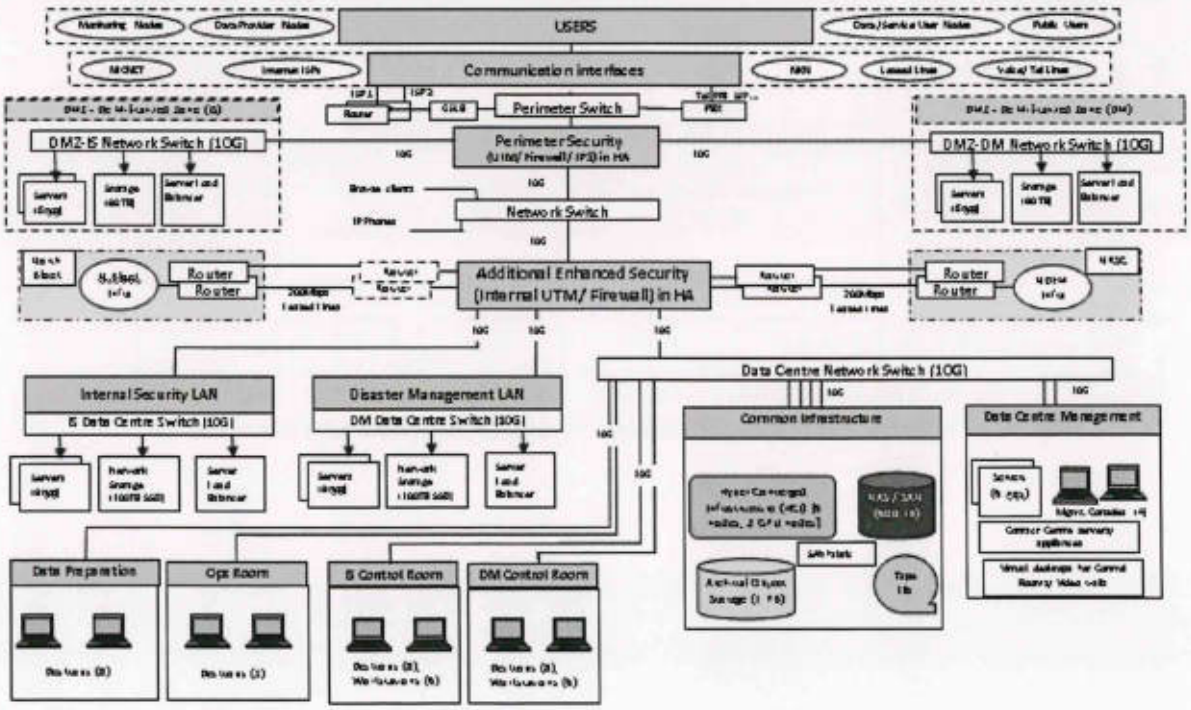

Figure ia. ICR-ER Systems Architecture Overview - NDCC-II Building Data Centre Perspective

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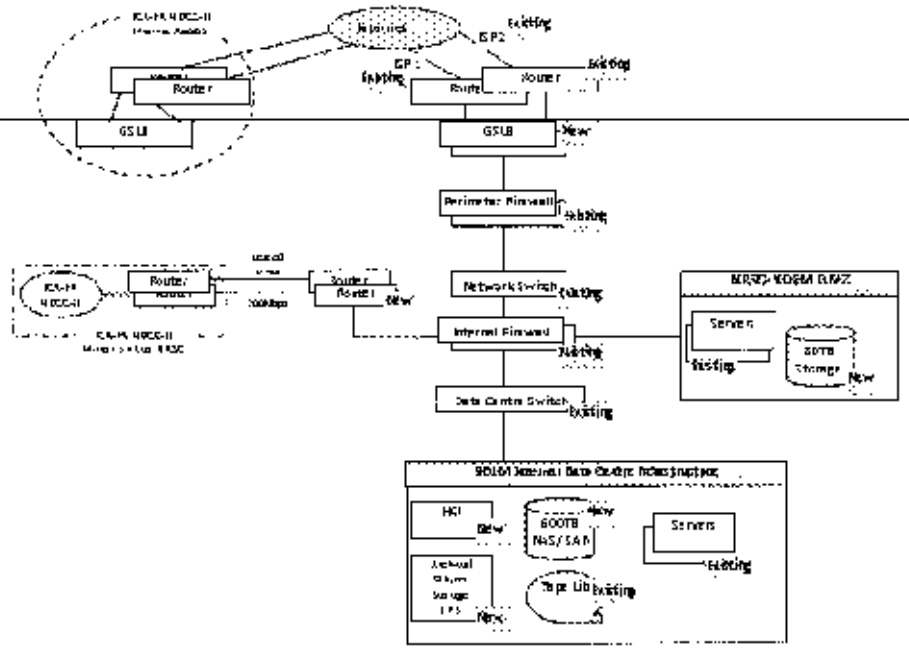

Figure ib. ICR-ER Systems Architecture -- Mirror at NDEM, NRSC

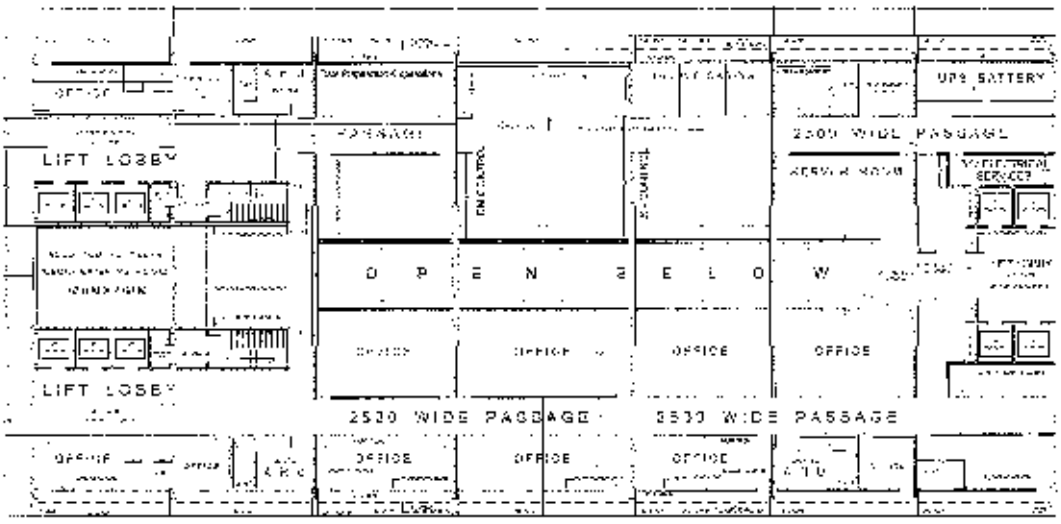

Figure ii. ICR-ER in NDCC-II Building - rooms layout plan with dimensions

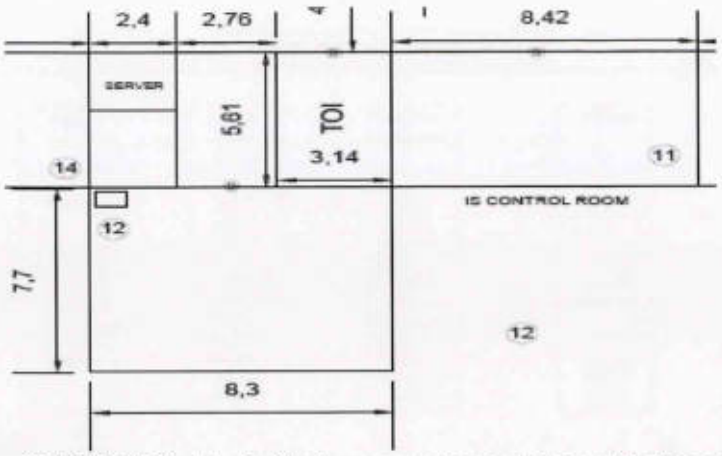

Figure iii. ICR-ER in North Block - rooms layout plan with dimensions

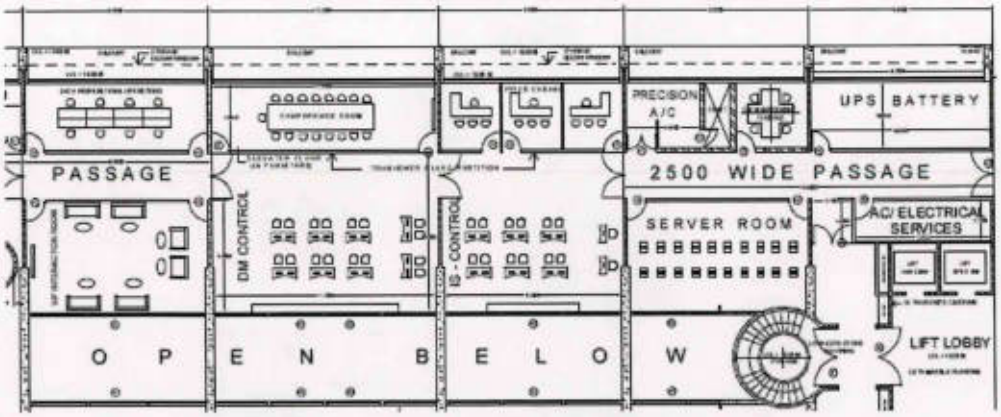

Figure iv. - positioning of equipments, furniture

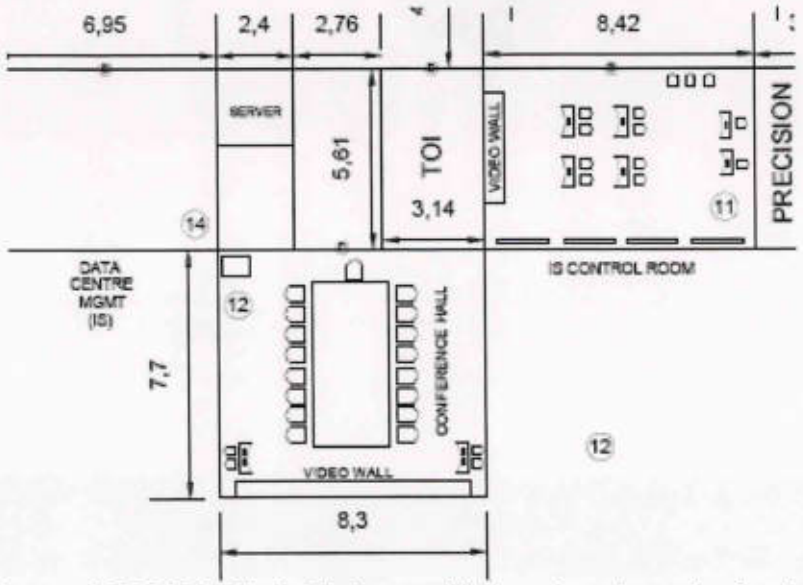

Figure v. ICR-ER in North Block - positioning of equipments, furniture

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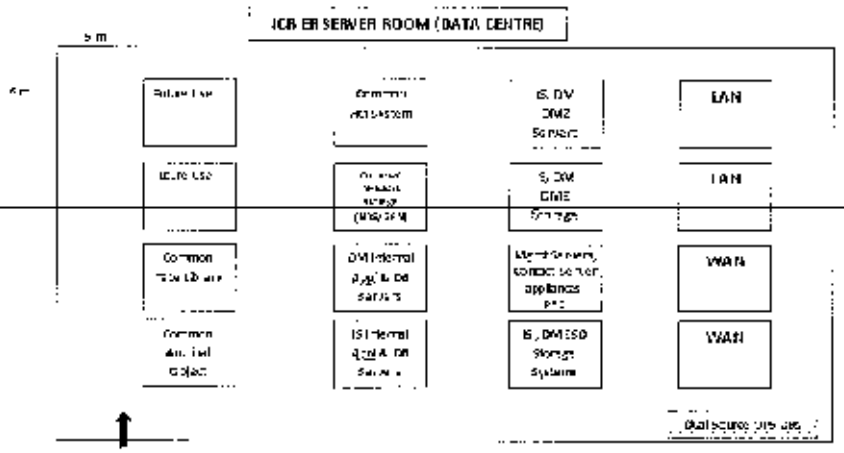

Figure vi. Server room racks details

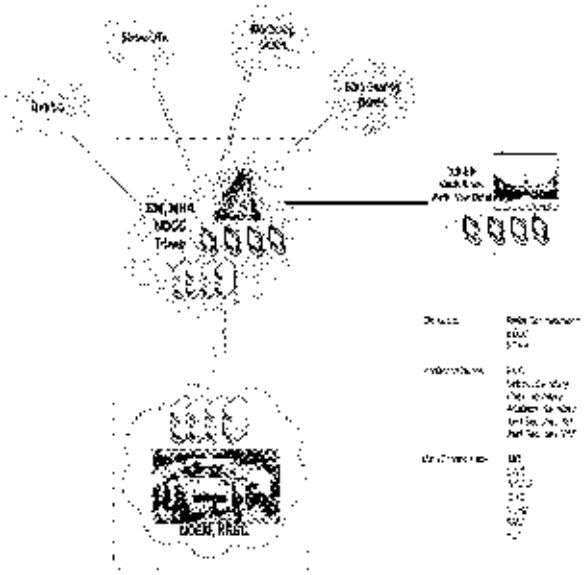

figure vii. ICR-ER network links details

Scope of work: Civil Works including electrical, UPS, smoke detection and Air-conditioning works

The scope of work includes dismantling existing old partitions, flooring and ceiling items and taking away by the agency before starting the modifications /renovation works to suit the requirement of ICR-ER facility. Subsequent to dismantling and site clearance, the main work consists of providing suitable partitions, false ceiling flooring and acoustic insulation etc..and associated electrical and air conditioning works with new material and as per the new floor plans as detailed in the document. It is a turnkey job to be executed as per the attached drawings and requirements as mentioned in the tender document.. Being a modification of existing building, the vendors shall visit the site and understand the scope of work in detail and consider all items of work involved in realisation of the facility.

The work at NDCC towers is in 4th floor while in the North block it is in ground floor area. The necessary arrangements for movement of men and material and all safety precautions etc. shall be duly considered by the bidder and adequate measures shall be taken for smooth execution of work without disturbance to other functional areas within the building. The vendor shall consider all these aspects and quote accordingly, as no extra claims or charges shall be payable on the quoted amount.

Scope of work covered is given is indicative. Vendors shall inspect the site and take into account the various factors for realization of the civil works including civil items required for internal electrical and AC work components that are to be carried out simultaneously for establishing of ICR-ER facility.

Internal Electrification including UPS Distribution is with concealed / surface steel conduit wiring. Wherever, it is not feasible to conceal the conduit, the same shall be surface run above false ceiling. Illumination in all areas is with illumination levels as per standards. LED luminaries are proposed with point wiring. Lighting in common areas shall be planned with dual channel timer control. Manual override points are planned at convenient locations to bypass the timers if required. Two light fittings in all the rooms shall be powered with UPS supply. Light Dimming system is proposed for Conference Room with Dali dimmable Luminaries.

Single phase and three phase power points shall be planned as per requirement of servers / racks / work station. Power supply for air-conditioning system shall be suitably planned. Power supply to all the above points shall be tapped from DBs and sub-panels at convenient locations. Perforated cable trays are proposed for the cabling and shall be installed above the false ceiling in false ceiling areas. Powder coated box sections are proposed below false ceiling up to DBs.

2 x 200 kVA UPS with 'SMF' battery banks with 30-minute backup shall be provided to meet the UPS load requirement of Data storage racks & Console room etc. Battery sizing shall as assessed as per IEE 485. 32A Single phase plugs sockets (with MCBs) of tempra model of Legrand make or equivalent shall be provided for server racks. UPS input & output panels/DBs shall be proposed for the above UPS systems. A new MV panel shall be proposed with two incomers to meet the load requirement. Power supply shall be tapped from the substation with dual feeder cables connecting to the main panel of the building. Two incomers are provided in the panel with electrical & mechanical interlock arrangement to choose any one feeder at a time.

Separate UPVC cable management systems shall be planned for power & communication cables. Conduit & wiring for Telephone, TV points & LAN/Internet shall be planned. Floor

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Deputy Secretary
Ministry of Home Affairs

raceways shall be planned for providing distribution for power points, telephone, TV, Internet etc for reaching furniture. Power supply to split AC units, VRF Cassette units, VRF Outdoor units, Precision AC units, shall be tapped from the proposed MV panel. Maintenance free Earth stations are proposed for power earthing, UPS body & Neutral etc.

Smoke detection shall be provided with addressable smoke detectors of multi-sensor type (both heat & smoke). Smoke detectors are also located above false ceiling & below false ceiling. Manual call points and sounders shall be provided at entry/exit. Short circuit isolators shall be provided for every 20 detectors in the loop. The detectors are connected to the Fire Alarm control panels by concealed/surface wiring and the panel is proposed with two loops. Mass Notification system (provided in the same FACP panel) with speakers in all areas, Fireman's telephone handsets including necessary control and display are provided in this facility. A repeater panel is planned at Security building and connected by 4C x 2.5 sq.mm armoured & screened copper cable.

In the North Block of MHA ,Internal Electrification including UPS Distribution is with concealed/ surface steel conduit wiring. Wherever, it is not feasible to conceal the conduit, the same shall be surface run above false ceiling. Illumination in all areas is with illumination levels as per standards. LED luminaries are proposed with point wiring. Two light fittings in all the rooms shall be powered with UPS supply. Light Dimming system is proposed for Conference Room with Dali dimmable Luminaries. Single phase and three phase power points shall be planned as per requirement of servers / racks / work station. Power supply for air-conditioning system shall be suitably planned. Power supply to all the above points shall be tapped from DBs and sub-panels at convenient locations. Perforated cable trays are proposed for the cabling and shall be installed above the false ceiling in false ceiling areas. Powder coated box sections are proposed below false ceiling up to DBs.

Power supply to respective DBs (Lighting, Power and UPS DB) shall be tapped from respective panel available in the north block building. Separate UPVC cable management systems shall be planned for power & communication cables. Conduit & wiring for Telephone, TV points & LAN/Internet shall be planned. Floor raceways shall be planned for providing distribution for power points, telephone, TV, Internet etc for reaching furniture.
Power supply to split AC units, VRF Cassette units, VRF Outdoor units, Precision AC units, shall be tapped from MV panel exists. Maintenance free Earth stations are proposed as per requirement. Smoke detection shall be provided with addressable smoke detectors of multi-sensor type (both heat & smoke). Smoke detectors are also located above false ceiling & below false ceiling. Manual call points and sounders shall be provided at entry/exit. The detectors are connected to the Fire Alarm control panel exists by concealed/surface wiring.

Providing air-conditioning works for establishing ICR-ER at NDCC and North Block of MHA including design, supply installation, testing and commissioning of the Air conditioning system to meet the inside design conditions for various areas like Data Centre(Server room), Control rooms, Conference halls and office areas etc.. as per the details indicated in the drawings and in the document. The vendor shall provide detailed design data and proposed air-conditioning equipment and accessories details with list of deliverables etc. area wise in the technical bid (part I). The vendor shall consider the detailed requirements of various AC areas and their operational requirements and arrive at the air-conditioning system accordingly. The air-conditioning system for UPS room, Data centre (server room) shall be independent for those areas only which shall be provided with suitable precision AC systems of DX type. For other areas suitable VRF

systems with indoor units shall be considered and all areas shall be provided with standby capacity to meet the operational requirement.

Civil Works for setting up of Integrated Control Room for Emergency Response at NDCC and North Block, MHA, New Delhi.

Sl.No	Generic name of the item with detailed specifications	Qty
1	**Civil** – Renovation, Refurbishment of existing rooms for control room, conference halls, VIP interaction room, data management, preparation at NDCC towers, Control room and conference hall at North Block. Work on turnkey basis including all required material , labour and Tools & Plants for carrying out the job in a workmanship manner with all necessary finishes etc. **Scope of work covered is given below which is indicative.** Vendors shall inspect the site and take into account the various factors for realization of the civil works including civil items required for internal electrical and AC work components that are to be carried out simultaneously for establishing of ICR-ER facility.	1 Job
	NDCC II, 4th floor	
1.1	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material by taking away including necessary labour and transport etc Approx...10 Cum	
1.2	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete as required and as per site conditions.	
1.3	Dismantling tile work in floors/ PVC tiles/ wooden flooring and roofs laid in cement mortar, wooden boarding's in lining of walls and partitions, wall panelling, supporting membersetc. of all thicknesses including necessary labour and transport etcand disposal of unserviceable material by taking away including necessary labour and transport etc	
1.4	Dismantling aluminium / gypsum partitions, doors, windows, fixed glazing and false ceiling including disposal of unserviceable surplus material.	
1.5	Half brick masonry with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V leve, as per drawing and as per site conditions and approximate quantity of about 100 Sqm Cement mortar 1:4 (1 cement :4 coarse sand)	
1.6	Providing and fixing 18mm thick gang saw cut, mirror polished, pre-moulded and pre-polished, machine cut for kitchen platforms, vanity counters, window sills, facias, wall cladding and similar locations of required size, approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (! cement: 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish, etc., complete at all levels. Granite of any colour and shade. Approx quantity being 80 Sqm	
1.7	Providing edge moulding to 18mm thick marble stone counters, vanities, etc., including machine polishing to edge to give high gloss finish etc., complete as per design approved by Engineer-In-Charge. And as per site conditions. Approximately 40 mtr qty.	
1.8	Providing and laying vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08% and confirming to IS:15622, of approved make, in all colours& shade, laid on 20mm thick cement mortar 1:4 (1 Cement: 4Coarse sand), jointing with grey cement slurry @ 3.3	

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	kg/sqm including grouting the joint with white cement & matching pigments, etc. complete. Size of Tile 600 x 600mm for flooring- approx. 300 Sqm	
1.9	Providing and laying vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08% and confirming to IS: 15622, of approved make, in all colours& shade, in skirting, riser of steps, over 12mm thick bed of cement mortar 1:3 (1 Cement: 3 Coarse sand), jointing with grey cement slurry @ 3.3 kg/sqm including grouting the joint with white cement & matching pigments, etc. complete. Skirting with Size of Tile 600 x 600mm/ 100mm. (Approx.15 Sqm)	
1.10	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fastn lugs or with dash fasteners of required dia& length (hold fast lugs or dash fastener shall be paid for separately).Second class teak wood (1 Cum approx.)	
1.11	High gloss melamine polish on doors, shutters, partitions etc. after completely scraping the existing surface by using paint remover of required qty sand papering and preparing base surface smooth with two coats of spirit polish and under coat of wood sealer @ 0.74lit/10sqm to give required finish, finally polishing the surface with rubbing compound @ 0.50kg/10sqm complete as per direction of Engineer-in-charge.(approx. 230 Sqm)	
1.12	Providing and fixing frosted crystal films of 3M of approved colour and approved pattern on toughened glass as per direction of Engineer-in-Charge. (approx. 30 Sqm)	
1.13	Providing and fixing roller blinds make of Hunter Douglas (Model roller blind blackout fabric) or equivalent I/C operating system such as End Plug/ Support Brackets/roller Tube Bottom Rail/Ballchainetc. All complete as per site requirement andas per direction of Engineer-in-charge.(Approx 115 Sqm)	
1.14	Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with IS : 3564,membossed on the body, door weight upto 36 kg to 80 kg and door width from 701 mm to 1000 mm), with double speed adjustment with necessary accessories and screws etc. complete. (30 no)	
1.15	Providing and fixing ISI marked flush door shutters with view panel conforming to IS:2202 (Part-I) decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters. 35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws. (Aprox 30 Sqm)	
1.16	Providing and fixing plywood 4 mm thick, one side decorative veneer conforming to IS: 1328 (type-1), for plain lining / cladding with necessary screws, including priming coat on unexposed surface with : Decorative veneer facings of approved manufacture(approx.10 Sqm)	
1.17	Providing and fixing wooden moulded beading to door and window frames with iron screws, plugs and priming coat on unexposed surface etc. complete :2nd class teak wood 50x12 mm. (120 Metre)	
1.18	Providing and fixing bright finished brass tower bolts (barrel type) with necessary screws etc. complete :250x10 mm (40 nos)	
1.19	Providing and fixing bright finished brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete. (22 nos)	

1.20	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete. (34 nos)	
1.21	Providing and fixing factory made uPVC white colour casement/casement cum fixed glazed windows comprising of uPVC multi chambered frame, sash and mullion (where ever required) extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, EPDM gasket, stainless steel (SS 304 grade) friction hinges, zinc alloy (white powder coated) casement handles, G.I fasteners 100 x 8 mm size for fixing frame to finished wall, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. (Single / double glass panes and silicon sealant shall be paid separately) Note: For uPVC frame, sash and mullion extruded profiles minus 5% tolerance in dimension i.e. in depth & width of profile shall be acceptable. Casement window double panels with S.S. friction hinges (350 x 19 x 1.9 mm) made of (big series)frame 67 x 60 mm & sash / mullion 67 x 80 mm both having wall thickness of 2.3 ± 0.2 mm and single glazing bead/double glazing bead of appropriate dimension. (Area of window above 1.50 sqm).Total quantity approximately 150 Sqm	
1.22	Providing and fixing casement handle made of zinc alloyed (white powder coated) for uPVC casement window with necessary screws etc. complete. (32 nos)	
1.23	Providing and fixing 12 mm thick frameless toughened glass door shutter/partition wall of approved brand and manufacture, fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately). 5 Sqm	
1.24	Providing and fixing stainless steel patch fittings of OZONE all complete as per direction of Engineer in charge. Patch corner lock OPL-1 with strike plate (8 nos)	
1.25	Providing and fixing stainless steel patch fittings of OZONE all complete as per direction of Engineer-in-charge. OGC-4 Glass To Wall Connector at 90 Degree (8 nos)	
1.26	12mm cement plaster of mix:1:6 (1 cement: 6 coarse sand)-5 Sq.m	
1.27	Providing and applying plaster of paris putty of 2mm thickness over plastered surface to prepare the surface even and smooth complete (410 Sqm).	
1.28	Wall painting with acrylic emulsion paint of approved brand and manufacture to give an even shade: Two or more coats on new work (410 Sqm)	
1.29	Providing and laying Unbacked flexible P.V.C flooring/ skirting with P.V.C sheets tiles as specified below of approved make and shade including preparing the surface, cleaning as required and applying adhesive - as recommended by the P.V.C tile manufacturers, laying, aligning, cutting in required size and pattern, trimming of tiles, removing the adhesive stains on the surface including cleaning	

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	the surface with soap solution (2 table spoons of soap powder for 5 ltr of water) using a cloth or mop or and wiping the dried surface with soft dry cloth etc; complete all as per specifications. In PVC flooring/ skirting/ dadoing: With 1.80mm thick Unbacked flexible fully homogeneous PVC sheets in rolls of approved make and quality conforming to IS: 3462-1986. (Approx 140 Sqm)
1.30	Providing and laying Indian patent stone flooring with cement concrete 1:2:4 (1cement: 2 coarse sand: 4 graded stone aggregate) using graded granite stone aggregate obtained from approved quarry laid to level or slope in bays not exceeding 3sqm per panel including providing 3mm thick Aluminium dividing strips to the full depth of the flooring and finished smooth with float coat of cement at 4.4kg/sqm, curing, etc., complete all as per specifications. 25mm thick (Using 12.5mm Nominal size stone aggregate)-160 Sqm
1.31	Providing and fixing Steel Infill Access floor (false floor) systems of M/s. DG False flooring& Technologies Pvt. Ltd. Or M/s United Access Floor Pvt., Ltd., or equivalent all as per following specifications: S Y S T E M : The access floor system to be installed shall provide a minimum finished floor height of 300mm to 600mm from the existing floor level. The system shall provide suitable pedestal and under- structure designed to withstand various static loads and rolling loads subjected to it in an office/ server/ DCS/ panel/ rack area/ clean rooms/ control rooms, etc,. The entire access floor system shall provide for adequate fire resistance. acoustic barrier and air leakage. P A N E L: Unitile USF-1200 Access Floor panel of size 604 x 604 mm shall be all steel welded construction, with an enclosed bottom pan of 64 hemispherical cones and a top plain sheet which are fuse welded at 124 locations to form a panel of an overall depth of 36 mm. (Approx.45 Sqm)
1.32	The inner empty core of the panel is injected with a light weight fire retardant, non combustible cementations compound at high pressure to fill in all the crevices of the panel and ensures support of not less than 85% of the top surface area of the panel. The panel after cleaning, degreasing, phosphating by 7 tank process is coated with 40 micron epoxy coat and is heated to achieve maximum adhesion and surface resistance. L A M I N A T I O N: The panel is then laminated with 1.5 mm thick fire retardant floor grade antistatic laminate on a semi -automated lamination line to ensure maximum bonding to the steel surface. The edges of the laminated/pvc is protected with black pvc edge trim 5mm wide on all sides. This edge trim is mechanically locked and sealed in place to avoid detachment P A N E L - L O A D I N G: Concentrated Point Load - 560kg on a 25 x 25 mm square indenter on the centre of the panel with a maximum permissible deflecting of not more than 2.5mm. Uniformly Distributed Load (UDL) - 1680 kg/ M2 with a maximum permissible deflecting of not more than 2.0 mm. F I R E R A T I N G: The Panels shall confirm to Class O & Class 1 Fire Ratings tested as per BS 476 Part 6 & 7 SUB STRUCTURE - PEDESTAL ASSEMBLY: Sub structure installed to support the panel shall be suitable to achieve a minimum finished floor height of 65mm to a maximum of 600 mm from the existing floor level. Pedestal design shall confirm speedy assembly and removal for relocation and maintenance. The assembly shall provide easy adjustment of levelling and accurately align panels for a maximum 30 mm up and down in the vertical direction. Pedestals shall support an axial load of 2200kg. without permanent deflection and an ultimate load of 3500 kg. The Pedestal head

	assembly shall consist of an 80X80 mm aluminium die cast proprietary designed head which shall have an inbuilt stringer snap locater, panel locater for side wall and the bottom base locater pin which enables the panel to be in position independently with or without stringer.	
	The aluminium head is positioned in the pedestal pipe with a 18 mm rolled form threads and with 2 check nuts for level adjustment and arresting vertical movement. The Pedestal Base assembly shall consist of 22mm OD pipe of thickness 1.6mm projection welded to a base plate of 100 x 100 x 2mm thick with stiffening folds. The sub structure assembly shall be suitably anchored to the floor with suitable adhesive or fastener as recommended by the manufacturer All steel components shall be electro galvanized. S T R I N G E R S: The stringer is electro galvanized steel cold rolled construction specially designed for lateral stability, rolling loads and to support the panels on all four sides for alignment. The stringer to have a counter sunk holes at both ends to accommodate bolting of the same to the pedestal head assembly. The stringers shall be 20 x 25 x 1 x 575 mm N O T E: 1. One no. of panel lifting device has to be supplied freely to Department for day to day maintenance. The quoted rate shall be inclusive of lifting device. 2. Contractor shall provide a guarantee certificate for a period of 5 years for any manufacturing defects from manufacturers. 3. The work shall be executed as per the manufacturer's specifications at all floors and at all heights.	
	Providing and fixing at all height in all floor with all lead seamless type M/F suspended False ceiling of **Saint Gobain or equivalent** using GI perimeter channel of size 0.55mm thick (having one flange of 20mm and another flange of 30mm and a web of 27mm) along with perimeter of ceiling, screws fixed to brick wall / partition with the help of nylon sleeves and screws at 610mm centres. Then suspending GI intermediate channels of size 45mm (0.9mm thick with two flanges of 15mm each) from the soffit at 1220mm centres with ceiling angle of width 25mmx10mmx0.5mm thick fixed to soffit with GI cleat and steel expansion fasteners. Ceiling section of 0.55mm thickness having knurled web of 51.5mm and two flanges of 26mm each with clips of 10.5mm are then fixed to the intermediate channel with the help of connecting clip and in direction of perpendicular to the intermediate channel at 5\457mm centres. 12.5mm tapered edge gypboard (conforming to IS 2095-1982) is then screw fixed to ceiling section with 25mm dry wall screws at 230mm centres. Screws fixing is done mechanically either with screw driver or drilling machine with suitable attachment. Finally the boards of 12.5mm thick gyp board are to be jointed and finished so as to have a flush look which includes filling and finishing the tapered and square edges of the boards with jointing compound, joint paper tape and two coats of drywall topcoat suitable for gypboard including providing scaffolding and executing the work at all heights. (Please refer drawing for details and recommended practices of Saint Gobain or equivalent). NOTE : For lighting fittings, grills diffuses and cut outs etc., have to be made with the frame of perimeter channels of size 20mm x 27mm x 30mm x 0.55mm thick supported suitable and should be considered as per drawing. (Aprox.180 Sqm)	
1.33	Providing and fixing of 'Classic lite' Microlook Edge/Prima Fine Fissured (Armstrong) Mineral Ceiling Tile in true horizontal level, false ceiling grid manufactured by M/s. Armstrong World Industries or equivalent using hot dipped galvanized steel sections, exposed surface chemically cleaned capping prefinished in baked polyester paint, Armstrong main tee size 30 x	

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	15mm every 1200mm c/c maximum and rotary stitched 1200mm, Armstrong cross tee at every 600mm c/c and 600mm Armstrong cross tee at every 1200mm c/c maximum and Armstrong wall angle all around the wall to form grid size of 600x600mm and suspending the grid using 2mm pre straightened GI rod/wire and 8mm dia anchor fasteners at every 1200mm intervals at the main tee and laying 'Classic lite' Microlook Edge/Prima Fine Fissured (Armstrong) Mineral Fibre Ceiling Tiles of size 600mm x 600mm x 15mm over the formed grid, including providing necessary openings and additional framework required for light fittings, etc., manufactured by M/s Armstrong World Industries, having fire rating of 60 minutes as per BS 476/23 of 1987, light reflection of >85%, Noise Reduction Co-efficient (NRC) of 0.50, Sound attenuation of 32db, k-0.052 - 0.067 W/m K, weight of 4.0kg/sqm and Humidity Resistance of 95%. The work shall be executed as per the manufacturers specifications and direction of Engineer-in -charge. (410 Sqm)
1.34	Providing wall panelling with combination of hard and soft panelling fixed to MDF or equivalent FSC certified wooden board frame work as indicated below all as per drawing, specification and satisfaction of EIC at all heights and levels. (Approx 410 m) 1. Providing and fixing frame work for wall panelling made out of 35mm thick MDF or equivalent FSC certified wooden board cut out required size of 35mm x65mm battens and fixing it to wall surface with necessary screws and dash fasteners in vertical and horizontal direction forming a grid of 600 x 600mm. The frame shall be coated with a coat of primer before fixing.
1.35	2. Providing and fixing boards / sheets as specified below including cutting to required size and shape, including fixing with suitable rawl plugs or self-tapping screws etc., as shown in the drawing. Supplying and fixing of fire resistant, ISI mark BWP FR grade plywood of 8mm thick finished with 4mm thick design Veneer (of approved shade) with melamine finish adhered to plywood fixed on MDF or equivalent FSC certified wooden board frame work - of approved make with design beading/ moulding of approved shade and design with suitable spacers by using rawl plugs or self tapping screws as shown in the drawing. Complete to the satisfaction of EIC at all heights and levels (Beading / moulding will be measured and paid as separate item)-270 Sqm
	3. Providing and fixing 12mm thick soft board cut to required size and covered with approved quality handloom fabric cloth with about 100mm back turn on back side of soft board on all sides for acoustic treatment / wall panelling and backing of 6mm thick commercial plywood with commercial veneers on both faces including gluing the boards with fevicol adhesive fixed on MDF or equivalent FSC certified wooden board frame work using nails, screws, etc., all complete to the specification of Engineer-in-charge.(Approx. 30 Sqm)
	4. Providing and fixing design beading / moulding of approved make, design and shade as per drawing and specification and as directed by Engr in Charge.(260 m)
	5. Providing and fixing thermal/acoustic insulation with Resin Bonded rock wool conforming to IS: 8183, having density 48 kg/cum, 50 mm thick, wrapped in 200 G Virgin Polythene Bags fixed to wall with screw, rawl plug & washers and held and in position by criss-crossing GI wire etc. complete as per directions of Engineer-in-Charge. (300 Sqm)

	Providing and fixing at all heights/ in all floors with all leads color Anodised(15 micron)/powder coated(60 micron) as directed by Engineer In-Charge Aluminium doors/ windows/ partitions manufactured from best extruded Aluminium sections confirming to ISI, cut to length, joints mitred and corners grinded with joints water proof the outer frame and shutter frame stiffened with corner angle strips or provided for in the frame for fixing the frame to R.C.C Columns/ masonry on sides, RCC lintels on top and P.C.C sills or floor at bottom, the frame work fixed with standard approved fastenings all generally as per details shown in drawings and specification with all the sections pre-treated for removal of any rust and prevention of further rust formation and coated with greasy materials for non- adherence of mortar or any other sticky materials and this coat to be removed after installations of the sub-dividing frames by tenanted and riveted into frames all aluminium surface be thoroughly cleaned free or rust scale or dirt and mill scale by pickling surfaces finished with colour anodized / powder coated as specified in dull matt finishing including cost of pull and push plates and fixtures for hinged openings (arrangement with steel bearings wherever necessary), cost of labour for fixing of mortise lever locks, aluminium handles, door fittings like tower bolts etc., supplied free for fixing including screws / bolts (Or these materials measured separately elsewhere) where shutters are involved etc., complete, cost of providing and fixing of glass of selected glazing quality of thickness and type of glass specified hereinafter or panel boards including nylon or PVC or rubber lining of approved quality wooden grounds, rubber gasket, aluminium glazing clips, mastic etc., and fixing with aluminium glazing clips and also snap-on type with holes as per drawing and specifications provided for separately in the sub items following the main items of frame work for partition and door shutters as below: NOTE: All fitting works shall be carried out as per I.S specifications including necessary rivets, screws, lugs, scaffolding, etc., complete all generally as per drawings. The sizes of the components should confirm as per details in drawings. Rate includes SS ball bearing Hinges of 125mm heavy duty	
1.36	1. Providing and fixing of frame work (Styles and rails) for Doors shutters/window shutters with required sections of JINDAL/ INDAL make or equivalent including providing all items and hinged / pivoted arrangements with stain less steel ball bearing hinges for operation of shutters and labour cost for fixing of door fittings and locks (Which shall be free issues for fixing or paid separately) etc., complete. (Aluminium beadings and glazing clips measured under this item only.)-approx.1500 kg	
	2. Providing and fixing Glass panes of selected glazing quality and thickness as specified below including providing and fixing Nylon/Rubber/ PVC lining of approved quality and fixing with Aluminium glazing clips/ Aluminium beadings (Supply cost of Aluminium clips/ Aluminium beadings are measured in items 13.1 and 13.2 above for DOORS / WINDOWS/ PARTITIONS etc., Using 4.5mm to 5.0mm thick plain glass(125 sqm)	
	3. Providing and fixing boards/ sheets as specified below including cutting to required size and shape, fixing with aluminium glazing clips or triangular beading (measured and paid under item 13.1 &13.2 above) including screws, putty etc., complete, Using 12mm thick three layered flat pressed both sides teak veneered Teak wood particle board, bonded with Phenol formaldehyde(80 sqm)	
	Providing and fixing best quality of decorative laminated sheet 1.00mm thick of	

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	approved make, matt finish, of approved colour conforming to I.S. code. fixing to flush shutter, etc: using adhesive Fevicol-SH or equivalent, complete all as per specifications. (Approx.60 sqm)	
1.37	Supplying and fixing hydraulic floor spring conforming to IS 6315-92 floor type door closure (DORMA or equivalent) metalised coating on pivot suspension with ball bearings and adjustable on all six sides of type as specified below including fixing in position and adjusting for free and smooth movement etc., complete all as per the manufacturer's specifications and directions of Engineer in charge in all floors at all heights. Heavy duty with top plate size (318x197x2)mm, foundation box size (305x184x70)mm and leaver size (250x25x15)mm. (8 nos)	
1.38	Providing and laying 8mm thick LAMINATE WOODEN FLOORING/SKIRTING of PERGO ORIGINAL or equivalent (matt finish) consisting of panels of size 1194mm x 194mm having class of use - 23/33, wear resistance level of AC5 as per EN 13329 with a high pressure Laminate surface treated with aluminium oxide and a specially patented SURFACE GUARD + on top of a high density fibre board with a density of 910 Kg/ cum. The panels having a click system tongue and groove joint to secure a long lasting joint with the edges duly impregnated with paraffin. The Floating laminate flooring shall be laid over a 0.20mm thick polythene film to form a vapour barrier and 2mm to 3mm thick PERGO FOAM under layer to reduce impact sound etc., complete all as per manufacturers specification and directions of Engineer- in- Charge at all heights and levels etc. for: Flooring(Approx 180 sqm)	
1.39	**North Block, MHA**	
	Dismantling stone slab flooring laid in cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 meters lead. (65 sqm)	
1.40 1.41	Dismantling wooden boards in lining of walls and partitions, wall panelling excluding supporting members but including stacking within 50 metres lead	
	1.) Thickness above 25 mm up to 40 mm (180 sqm)	
	2.) Thickness above 50 mm up to 75 m (Approx quantity 35 sqm)	
	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 m lead as per direction of Engineer-in-Charge. In cement mortar (App 5 Cum)	
1.42	Providing and laying vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08% and confirming to IS:15622, of approved make, in all colors & shade, laid on 20mm thick cement mortar 1:4 (1 Cement: 4Coarse sand), jointing with grey cement slurry @ 3.3 kg/sqm including grouting the joint with white cement & matching pigments, etc. complete. Size of Tile 600 x 600mm for flooring. (Approx area 50 sqm)	
1.43	Providing and laying vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08% and confirming to IS:15622, of approved make, in all colors & shade, in skirting, riser of steps, over 12mm thick bed of cement mortar 1:3 (1 Cement: 3 Coarse sand), jointing with grey cement slurry @ 3.3 kg/sqm including grouting the joint with white cement & matching pigments, etc. complete. Skirting with Size of Tile 600 x 600mm/ 100mm(3 sqm)	
1.44	High gloss melamine polish on doors, shutters, partitions etc. after completely scraping the existing surface by using paint remover of required qty sand	

	papering and preparing base surface smooth with two coats of spirit polish and under coat of wood sealer @ 0.74lit/10sqm to give required finish, finally polishing the surface with rubbing compound @ 0.50kg/10sqm complete as per direction of Engineer-in-charge. (approx. 180 sqm)	
1.45	Providing and fixing roller blinds make of Hunter Douglas (Model roller blind blackout fabric) or equivalent i/c operating system such as End Plug/ Support Brackets/roller Tube Bottom Rail/Ball chain etc. All complete as per site requirement and as per direction of Engineer-in-charge. (14 sqm)	
1.46	Wall painting with acrylic emulsion paint of approved brand and manufacture to give an even shade: Two or more coats on new work. (55 sqm)	
1.47	Providing and laying Indian patent stone flooring with cement concrete 1:2:4 (1cement: 2 coarse sand: 4 graded stone aggregate) using graded granite stone aggregate obtained from approved quarry laid to level or slope in bays not exceeding 3sqm per panel including providing 3mm thick Aluminium dividing strips to the full depth of the flooring and finished smooth with float coat of cement at 4.4kg/sqm, curing, etc., complete all as per specifications. 25mm thick (Using 12.5mm Nominal size stone aggregate)-64 sqm	
1.48	Providing and laying 8mm thick LAMINATE WOODEN FLOORING/SKIRTING of PERGO ORIGINAL or equivalent (matt finish) consisting of panels of size 1194mm x 194mm having class of use - 23/33, wear resistance level of AC5 as per EN 13329 with a high pressure Laminate surface treated with aluminium oxide and a specially patented SURFACE GUARD + on top of a high density fibre board with a density of 910 Kg/ cum. The panels having a click system tongue and groove joint to secure a long lasting joint with the edges duly impregnated with paraffin. The Floating laminate flooring shall be laid over a 0.20mm thick polythene film to form a vapour barrier and 2mm to 3mm thick PERGO FOAM under layer to reduce impact sound etc., complete all as per manufacturers specification and directions of Engineer- in- Charge at all heights and levels etc. for flooring. (64 sqm)	
1.49	Providing and fixing of 'Classic lite' Microlook Edge/Prima Fine Fissured (Armstrong) Mineral Ceiling Tile in true horizontal level, false ceiling grid manufactured by M/s. Armstrong World Industries or equivalent using hot dipped galvanized steel sections, exposed surface chemically cleaned capping prefinished in baked polyester paint, Armstrong main tee size 30 x 15mm every 1200mm c/c maximum and rotary stitched 1200mm, Armstrong cross tee at every 600mm c/c and 600mm Armstrong cross tee at every 1200mm c/c maximum and Armstrong wall angle all around the wall to form grid size of 600x600mm and suspending the grid using 2mm pre straightened GI rod/wire and 8mm dia anchor fasteners at every 1200mm intervals at the main tee and laying 'Classic lite' Microlook Edge/Prima Fine Fissured (Armstrong) Mineral Fibre Ceiling Tiles of size: 600mm x 600mm x 15mm over the formed grid, including providing necessary openings and additional framework required for light fittings, etc., manufactured by M/s Armstrong World Industries, having fire rating of 60 minutes as per BS 476/23 of 1987, light reflection of >85%, Noise Reduction Co-efficient (NRC) of 0.50, Sound attenuation of 32db, k-0.052 - 0.067 W/m K, weight of 4.0kg/sqm and Humidity Resistance of 95%. The work shall be executed as per the manufacturer's specifications and direction of Engineer-in -charge. (Approx.115 sqm)	
1.50	Providing wall paneling with combination of hard and soft panelling fixed to MDF	

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	or equivalent FSC certified wooden board frame work as indicated below all as per drawing, specification and satisfaction of EIC at all heights and levels.	
1.51	1. Providing and fixing frame work for wall panelling made out of 35mm thick MDF or equivalent FSC certified wooden board cut out required size of 35mm x65mm battens and fixing it to wall surface with necessary screws and dash fasteners in vertical and horizontal direction forming a grid of 600 x 600mm. The frame shall be coated with a coat of primer before fixing. (142 M)	
	2. Providing and fixing boards / sheets as specified below including cutting to required size and shape, including fixing with suitable rawl plugs or self-tapping screws etc., as shown in the drawing.Supplying and fixing of fire resistant, ISI mark BWP FR grade plywood of 8mm thick finished with 4mm thick design Veneer (of approved shade) with melamine finish adhered to plywood fixed on MDF or equivalent FSC certified wooden board frame work - of approved make with design beading/ moulding of approved shade and design with suitable spacers by using rawl plugs or self tapping screws as shown in the drawing, Complete to the satisfaction of EIC at all heights and levels (Beading / moulding will be measured and paid as separate item)- 160 sqm	
	3. Providing and fixing 12mm thick soft board cut to required size and covered with approved quality handloom fabric cloth with about 100mm back turn on back side of soft board on all sides for acoustic treatment / wall panelling and backing of 6mm thick commercial plywood with commercial veneers on both faces including gluing the boards with fevicol adhesive fixed on MDF or equivalent FSC certified wooden board frame work using nails, screws, etc., all complete to the specification of Engineer-in-charge. (16 sqm)	
	4. Providing and fixing design beading / moldings of approved make, design and shade as per drawing and specification and to the satisfaction of EIC. (approx. 85 sqm)	
	5. Providing and fixing thermal/acoustic insulation with Resin Bonded rock wool conforming to IS: 8183, having density 48 kg/m3,50 mm thick, wrapped in 200 G Virgin Polythene Bags fixed to wall with screw, rawl plug & washers and held and in position by crisscrossing GI wire etc. complete as per directions of Engineer-in-Charge.(Approximately 175 sqm)	

1.52 Drawings

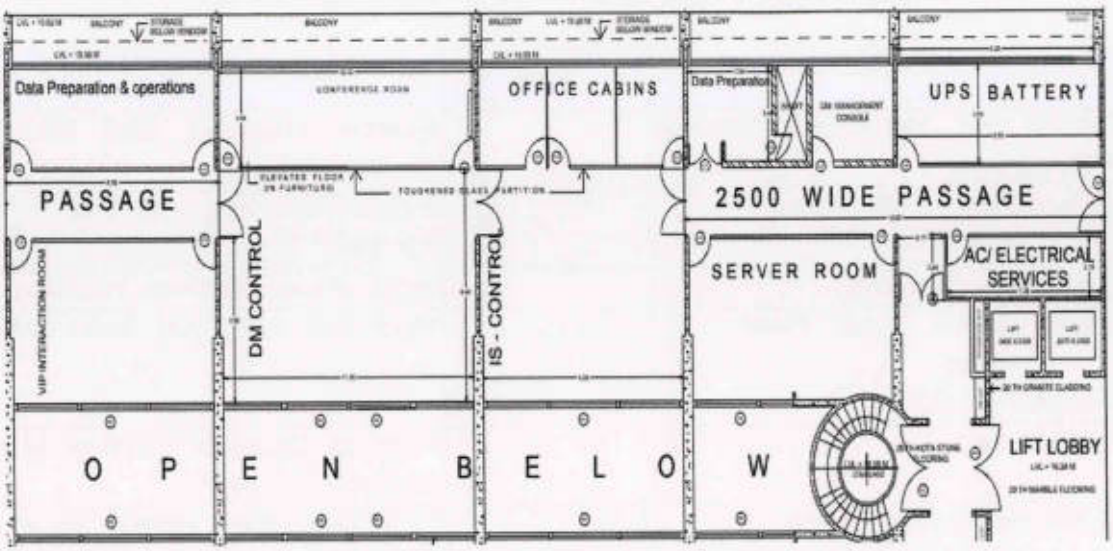

Figure 1.Floor layout / Plan with furniture for ICR ER at NDCC Tower

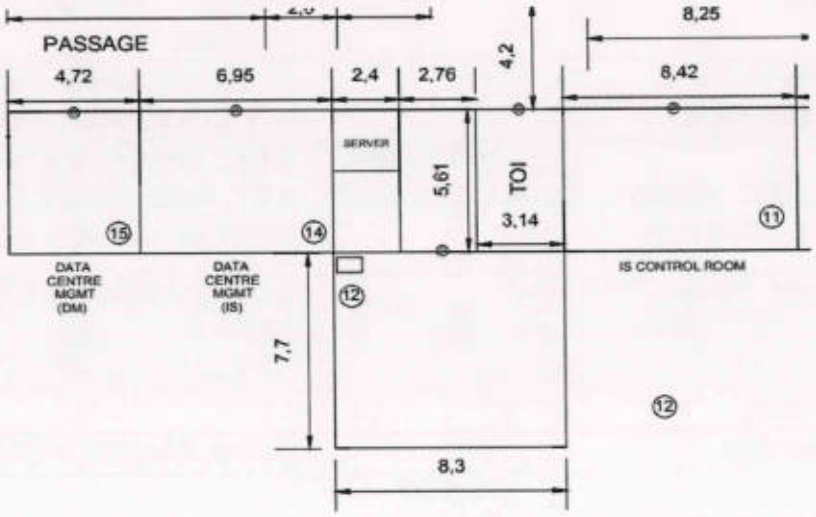

Figure 2.Floor layout / Plan with furniture for ICR ER at North Block (Room no. 11 & 12)

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Table 1. List of approved brands /makes for civil works.

Sl. No	Material	Relevant IS code	Manufacturers
1	Doors & Windows fixtures/ Fittings :		Everite, Hardima, Earl Bihari. Hardwyn, Godrej, Hettich
2	Door Closer / Floor spring :		Everite, Doorking, Hardwyn, Dorma, Godrej, Hettich
3	Aluminium Sections. :		Indal, Jindal, Bhoruka, Hindalco
4	Clear Glass/ Clear Float Glass/ Toughened Glass :		Modi(GG), AIS(Tata), Saint Gobain(SG)
5	Laminates :		Formica, Decolam, Century, Marino, National, Green Ply.
6	Synthetic Enamel Paints :		ICI paints, Lewis, Berger, Asian paints, Kansai Nerolac.
7	Oil Bound Distemper :		ICI paints, Lewis, Berger, Asian paints, Kansai Nerolac.
8	Cement Paint :		Snowcem Plus, Berger (Durocem Extra), Nerolac (Nerocem with titanium).
9	Plastic Emulsion Paint		ICI, Asian, Lewis, Berger, Dulux, Nerolac
10	Other Paints/Primers		ICI, Dulux, Asian, Berger, Nerolac
11	Cement : (OPC 43&53 grade conforming toBIS-8112)	8112-1989, 12269-1987	ACC, Grasim, JK, Ambuja, Ultra tech from L&T, Birla, Sankar cements and Chettinadu (from lot not more than 1month old).
12	Reinforcement Steel : TMT steel conforming to BIS-1786 with appropriate test certificate (Fe415/Fe500D)	1786	VIZAG(RINL)/ SAIL/ TISCON/ KAMACHI/ JSW/ IISCO, Jindal & Power Ltd. (name of JINDAL PANTHER)
13	Glass mosaic tiles		Italica, Bisazza, Pallidio
14	Gyspum Board System :	IS2095, BS1230, Gypsteel-BS 2994	India Gypsum, Laffarge, Boral
15	Wall putty :		Birla , JK or equivalent
16	Admixtures for concrete:	9103-1979	Fosrac, Cico, Sika, Jubliant Organosys, Roffe, Pidilite
17	Ceramic Tiles :	13755-1993	Kajaria, Nitco, Euro, Spartek, Johnson, Somany,
18	Pre-Laminated Particle Board :	12823-1990	Novopan, Greenlam, Kitlam, Bhutan Board.
19	Flush Door Shutters.	2191(PT)-1983(1-2)	Century, Kitply, Novapan, Green Ply

20	Silicon Treatment :		GE-Silicon, Pidilite, Choksey, Wacker, Forsoc.
21	Glazed Tiles :		Kajaria, Nitco, Euro, Spartek, Johnson, Somany, Bell

Table 2. List of approved makes Electrical works

Sl. No	Items/ Products	Name of brand make					
1	PVC Wires	LAPP INDIA	FINOLEX	GLOSTER	ANCHOR	KUNDAN CAB	DARSHAN PLUS
		PLOYCAB	STANDARD	RALLISON	EON	MYSOCABLES	
		V-GUARD	RR-KABEL	AVOCAB	Q-FLEX	RHINO	L&T
2	Modular Switches & 5A/15A sockets	LEGRAND	ABB	CRABTREE	GELCO	LISHA	NORTH-WEST
		STANDARD	L&T	ROMA (ANCHOR)	LITASKI	FINOSWITCH (FINOLEX)	TOYAMA
		SCHNEIDER	HAGAR	MK	VEGA	KOLORS	EON
		SALZER					
3	Sockets & Plugs (With Polycarbonate/ FRP/ Metal clad Body)	ABB	MENNEKES	LEGRAND	HAVELLS	NORTH-WEST	BCH-ELECTRIC
		SCHNEIDER	HENSEL	STANDARD	CYCLO	BEST & CROMPTON	CROMPTON GREAVES
4	Light fittings (Indoor) #	PHILIPS	OSRAM	ENDO LIGHTING	IGUZZINI	JAQUAR	LIGHTING TECHNOLOGIES
		WIPRO	TRILUX	BAJAJ	SURYA	HAVELLS	CROMPTON GREAVES
5	Lamps, Control gears & accessories	PHILIPS	OSRAM	WIPRO	SURYA	BAJAJ	HAVELLS
		CROMPTON GREAVES					
6	Lighting Management system	SCHNEIDER	LUTRON	PHILIPS	HONEYWELL	WIPRO	
7	Lighting Control Sensor	HONEYWELL	SCHNEIDER	LUTRON	WIPRO	PHILIPS	LEGRAND
8	Ceiling Fans (Star Rated)	USHA	ORIENT	KHAITAN	BAJAJ	HAVELLS	RALLIFAN
		CROMPTO					

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		N GREAVES					
9	BLDC Ceiling Fans	VERSA DRIVES					
10	Wall mounted / Pedestal Fans	USHA	ORIENT	KHAITAN	BAJAJ	HAVELLS	RALLIFAN
		CROMPTON GREAVES					
11	Exhaust Fans	USHA	KHAITAN	POLAR	EPC	CROMPTON GREAVES	V-GUARD
		ORIENT	CATA-C				
12	HRC Fuse Base & Carries	L&T	SIEMENS	ABB	GE POWER CONTROLS	HAVELLS	STANDARD
		SCHNEIDER					
13	Miniature Circuit breakers (MCBs) & Distribution Boards	LEGRAND	SCHNEIDER	ABB	GE	INDO ASIAN	SAFELINE
		L&T	HAVELLS	HPL	STANDARD	NORTH-WEST	HAGER
		C & S ELECTRIC	SIEMENS				
14	Earth Leakage Circuit Breakers (RCBO / RCCBs)	LEGRAND	SCHNEIDER	ABB	GE	L&T	INDO ASIAN
		SEIMENS	HAVELLS	HPL	STANDARD	NORTH-WEST	SAFELINE
		HAGER	C & S ELECTRIC				
15	Moulded Case Circuit Breakers (MCCSBs) up to 400A	SCHNEIDER	L&T	LEGRAND	HAVELLS	STANDARD	C & S ELECTRIC
		ABB	SEIMENS				
16	Moulded Case Circuit Breakers of all ratings	SCHNEIDER	L&T	ABB	LEGRAND	SEIMENS	GE
17	Surge Protection Devices (SPDs)	OBO BETTERMANN	LEGRAND	SCHNEIDER	SEIMENS	ABB	ERICO
		DEHN					
18	LT Current / Voltage Transformer	NIPPEN	PARAS	INTRANS	KAPPA ELECTRICALS	AUTOMATIC ELECTRIC	NEUTRONICS

						(AE)	
19	Armoured LT power cable (PVC & XLPE)	UNISTAR	GLOSTER	POLYCAB	HAVELLS	RPG	CCI
		TORRENT	KEI	FINOLEX	RHINO	RAVIN	BONLON
		VICCO	SINCO	TERA	THERMO CABLES	UNICAB	V-GUARD
		RALLISON	AVOCAB	CRYSTAL CABLES	ELKAY	GEMSCAB	INDOCAB
		CORD CABLE	INSUCON				
20	Armoured / un armoured control cable (PVC & XLPE) & special	LAPP	GLOSTER	POLYCAB	HAVELLS	UNISTAR	RPG
		CCI	TORRENT	FINOLEX	RALLISON	ADVANCE CABLES	
21	Armoured/un armoured telephone cable	POLTCAB	HAVELLS	RPG	FINOLEX	GEMSCAB	UNICAB
		V-GUARD	THERMO CABLES	ELKAY	SINCO	VICCO	LAPP INDIA
		ADVANCE CABLE	CORD CABLE				
22	Hear / Cold Shrinkable joint kits (HT & LT)	RAYCHEM	M-SEAL (3M)	MULTI PRESSINGS	GEE SEA		
23	Doubles walled corrugated HDPE pipes (for UG cables)	GAMSON	DURA-LINE	REX POLYEXTR-USIONS			
24	Fire Resistant Coating (FRC)	VIPER	STANVAC	HILTI			
25	LT Power Capacitors	SCHNEIDER	EPCOS	L&T	UNISTAR	SIEMENS	ABB
		KHATAU JUNKER	ASIAN POWER	SPRAGUE	CROMPTON GREAVES		
26	Measuring Instruments (analog & Digital meters, Data loggers & event Recorders)	L&T	SCHNEIDER	MECO	NEUTRONICS	NIPPEN	CG SCHLUMBERGER
		ELMEASURE	RISHAB	KRYKARD	CIRCUTOR	RIKEN	AUTOMATIC ELECTRIC (AE)
		SATEC	SECURE				
27	Single &Three	SCHNEIDE	L&T	JYOTI	LEGRAND	REMCO	CAPITAL

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	phase energy Meters	R				(BHEL)	POWER SYSTEMS
		SIEMENS	ECE	PROK DV's	CIRCUTOR	NIPPEN	SATEC
		SECURE					
28	Air-break Power /Control Contractors	L&T	ABB	C&S ELECTRIC	SIEMENS	CROMPTON GREAVES	BCH—ELECTRIC
		GE	SCHNEIDER				
29	Push-button stations, key actuators, rotary switches, toggle, switches , indicators, selectors switch	TEKNIC	ABB	L&T	SIEMENS	CROMPTON GREAVES	BCH - ELECTRIC
		SCHNEIDER	KAYCEE	JAY	JAINSON	C&S ELECTRIC	GE POWER CONTROLS
		VAISHNAV					
30	Electric Motors	ABB	GE	SIEMENS	KIRLOSKAR	CROMPTON GREAVES	JYOTI
		BHARAT BIJLEE	NGEF	LAXMI HYDRAULICS (LHP)			
31	Starters	L&T	ABB	SIEMENS	SCHNEIDER	BCH - ELECTRIC	GE POWER CONTROLS
		CROMPTON CONTROLS					
32	Soft Starters	ABB	SCHNEIDER	ALLEN-BRADLEY	CROMPTON CONTROLS	SIEMENS	
33	Variable Speed Drivers	ABB	SIEMENS	SCHNEIDER	DANFOSS	NELCO	LANDIS & STAEFA
		HITACHI	VERTIV				
34	Protective Relays (Electro mechanic & Numeric)	ABB	SIEMENS	L&T	JYOTI	ALIND	EASUN REYROLLE
		SCHNEIDER	C&S ELECTRI	PROK DV'S			

			C				
35	Fire alarm /smoke Detection system and control panel (FACP) & Aspiration system	RAVEL	SECUTRON	HONELWELL	HOCHIKI	NOTIFIER	MORLEY (HONEYWELL)
		SIEMENS	ZITON	EDWARD	TELEFIRE	SIMPLEX	THROUN SECURITY
		GST(UTC)	SCHRACK SECONET	FFE LTD.			
36	Cable Management system	OBO BETTERMANN	LEGRAND	MK	CENTURE	EUBIQ	
37	Ups (of all rating)	VERTIV	APC	RIELLO	PILLER	EPI	SOCOMEC
38	Isolation Transformers	VERTIV	PILLER	ESSENAR	SOCOMEC	APC	ECE INDURTIES LTD.
		RIELLO	APLAB	BHARAT BULEE	SCHNEIDER	AUTOMATIC ELECTRIC (AE)	VOLTAMP
		NUMERIC					
39a	Batteries :SMF	EXIDE	AMCO	PANASONIC	AMARA RAJA	SONNENCHEIN	
40b.	Batteries : Non-SMF	EXIDE	AMCO	PANASONIC	AMARA RAJA		
41	Thermoplastic (Polycarbonate / FRP) / Steel Switch box/ junction Box & Distribution Boards	HENSEL	SPELSBERG	BCH - ELECTRIC	ABB	PYROTECH ELECTRONICS	DEVI POLYMER
		PUSTRON	SPEYBOX	SINTEX			
42	Cables trays (PVC, FRP & GI)	SINTEX	L&T	PROFAB	CABLOFIL	OBO BETTERMANN	SUMIP COMPOSITES
		INDIANA	PATNY SYSTEMS				
43	Shock Proof Insulation Mat & Paint	SAFEVOLT	STANVAC	ELECTROMAT	TATA RUBBER CORPORATION	HILTI	

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44	Fire stop products	3M	HILTI				
45	Maintenance – free earthing kit with solid earth electrode and earth enhancing compound	OBO BETTERMANN	TEREC (SGI)	ERICO(GEM)	LORESS	ASHLOK	JMV LPS
46	Photo luminescent Signages	3M	SAFEX	PROLITE AUTOGLO			
47	Automatic Transfer	VERTIV	APC	RIELLO	PILLER	EP	SOCOMEC
		GE	L&T				
48	Static Transfer Switch (STS)	VERTIV	APC	RIELLO	PILLER	EP	SOCOMEC
		GE					

2. Electrical works for Integrated Control Room for Emergency Response (ICR-ER) at NDCC, and North Block, MHA, New Delhi

Sl.No	DESCRIPTION	Qty
2.	Electrical works - Providing electrical works for establishing ICR-ER at NDCC and North Block of MHA with Internal Electrification including wiring, UPS Distribution, Illumination with LED luminaries, Light Dimming system is Conference Room with Dali dimmable luminaries. **Scope of work covered is given below which is indicative.** Vendors shall inspect the site and take into account the various factors for realization of the electrical works including smoke detection system items etc..complete with all materials and labour required for completion and operationalisation of ICR-ER facility.	**1 Job**
	NDCC II	
2.1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular `switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. (Approx.50 points)	
2.2	Wiring for group controlled (looped) light point/ fan point/ exhaust fan point/ call bell point (without independent switch etc) with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.(60 points)	
2.3	Wiring for twin controlled light point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with 2 way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required (2 Points)	
2.4	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 6 amps modular socket outlet and 5/6 amps modular switch, connection etc. as required. (42 points)	
2.5	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 6/16 amps modular socket outlet and 15/16 amps modular switch, connection etc. as required. (6 points)	
2.6	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing of 1no of 6 pin 5/6 modular socket & 1 no of 15/16 amps modular socket outlet controlled by 1 no of 15/16 amps modular switch, connection etc. as required. (10 points)	
2.7	Wiring for circuit/ sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.	
	1. 2 X 1.5 sq mm + 1x 1.5 sq mm earth wire (800 mtr)	
	2. 2 X 2.5 sq mm + 1x 2.5 sq mm earth wire (300 mtr)	
	3. 2 X 4 sq mm + 1x 4 sq mm earth wire	
2.8	PIR sensors-5 nos	
2.9	Supply of LED light fittings with integrated driver, Optics, suitable casing, Heat	

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	sink Including LEDs and other accessories as required with the following detailed specifications: Light source: Height efficiency long life LEDs in integral module and viewing angle of 120 Deg. Avg. Life L 70 / B 50: 50000Hours or more. Electronic driver with short circuit protection, over voltage protection and other safety tests as per IS:15885 Part 2/Sec13.
2.10	36W full glow LED recessed / surface mounted (2x2) luminary day light, illumination @> 95 lumen / W rating.-80 nos
2.11	40w suspended 4' LED light fittings – 10 nos
2.12	Installation, testing and commissioning of wall bracket / ceiling fittings of all sizes and shapes containing upto two GLS /CFL / LED lamps per fittings complete with all accessories including connections etc. as required.(90nos)
2.13	Supplying and fixing of following way, horizontal type three pole and neutral sheet steel MCB distribution board, 415V, on surface/recess complete with tinned copper bus bar neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc as required, including supply and fixing of MCB/RCCB, adapter boxes for incoming and outgoing cables/ wires complete as required and as directed.
	6 Way TPNMCB DB (UDB-10 nos) Incomer :Four Pole 63A RCBO with 100mA leakage current tripping sensitivity Outgoing: 6A - 4 Nos, 16 A - 8 Nos, 20 A - 4 Nos, 25A - 2 Nos
	6 Way VTPNMCB DB (ACDB) (1 no) Incomer :160A 4P microprocessor based MCCB-1No. Outgoing : 63A TPN MCB -6NOS
	63A MCCB with junction box (Precision units) – 4 nos
2.14	Supply, fabrication, Installation, Testing and Commissioning of 3phase and Neutral 415V, 4 wire Floor mounted Following MV Panel /COP made out of 14SWG MS sheet after seven tank process and fire retardant painting and by incorporating as details given below:
	1. Cleaning and surface treatment of panel frame and all steel parts of the panel shall be carried out through seven tank process
	2. After rigorous surface treatment, panel shall be treated with powder coating process.
	3. Fire retardant paint shall be applied inside the switchgear chambers and bus bar chambers i.e., all interiors of the panel to be painted with similar to VIPER - FR - 001 and VIPER - FR + 1102
	4. The panel shall have fire retarding DMC/SMC barriers for opening around the bus bar near to the sectional bus barriers
	5. All terminations shall be made with proper lugs in an approved manner.
	6. All components, panels, cables etc., shall confirm to relevant IS specifications and shall also be got approved by Engineer In Charge
	7. The Panels shall have the following:
	a. High Mechanical and Di-electric strength
	b. Door interlocking facility for all switchgear cubicles.
	c. Facility for direct termination of specified size and numbers of armoured aluminium conductor cables.
	d. Shall have 50kA short circuit with standard capability.
	e. Panels of dust & vermin proof, fully tropicalised construction with 14SWG

	CRCA sheet with necessary anti corrosive treatment and powder coating of approved quality of Siemens grey shade. The panels shall be IP42, suitable for operation on 415V, 3phase, 4wire, 50Hz AC supply complete with all interconnections and consists components as specified.
	NOTE for MCCBs/MCB:
	a). All MCCB's shall be provided with required protections for S/C and O/L. The over load protection shall be field selectable. MCCB shall be suitable for horizontal and vertical mounting and with line load reversibility. b). All MCCB's should with stand I_{CS}=100%I_{CU}.
	All panels shall be provided with aluminium earth strip of suitable size as per IS norms with a provision for connecting earth strip on both sides of panel.
	Panel shall be got fabricated from the Department approved fabricators / manufacturers. Department approved makes of switch gear are only to be used in all M.V panels .
	Panel shall be installed on the existing trench / floor with necessary pedestal / channel complete as required and as directed.
	Main MV Panel - 1 set
	Incomer - 630A FP MCCB(settable)/ACB, 36 kA symmetrical breaking capacity, with ELR 300 mA to 3000 mA - 2 sets Bus coupler - 630A FP MCCB (settable)/ACB 36 kA symmetrical breaking capacity - 1 no
	Interlock: Mechanical interlocks shall be provided for all the above three MCCBs /ACBs with 2 keys so that 2 MCCBs/ACBs are in operation at a time.
	Bus bar: 800A TPN aluminium bus bar -1set
	Out goings:-
	a) 400A TPN, 36kA rating MCCB- 2no
	b) 250A TPN, 36kA rating MCCB- 4no
	b). 63A TPN, 36kA MCCB – 4 nos
	c). 40A TPN , MCB – 2 nos
	Metering:-
	Digital Multi-function meter with CTs 600/5A CTs - 1set
	UPS Input panel- 1 set Incomer -400A Microprocessor based MCCB-2nos O/g-400A Microprocessor based MCCB-1nos
	UPS Output panel – 1 set I/c-400A Microprocessor based MCCB-1nos O/g-100A Microprocessor based MCCB-5nos
2.15	Supply of 1.1 KV grade, 3.5C/4C, XLPE insulated, and overall sheathed, stranded aluminium conductor, flat steel strip / wire armoured cables conforming to IS:7098/Part - I (with latest amendments) and of following sizes. The cables shall bear ISI certification mark.
	4C x 25 sq. mm cable (for LPDB & UDB, AC DB) – 400 Mtr
	3.5Cx50 sq. mm cable (for LPDB & UDB) – 20 m
	3.5C x 120 sq. mm cable (COP to MVP)-130 m
	3.5C x 240 sq. mm cable (DG/Tr. to COP)- 600 m
2.16	Laying of cables
	Laying of one number of XLPE insulated and PVC sheathed power cable of 1.1kV grade of following size on cable tray as required.

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	3.5C x 120 sq. mm cable (clamped with 25 / 40 x 3 mm MS flat clamp) -50 m
	3.5C x 240 sq. mm cable (clamped with 40x 3 mm MS flat clamp) -600 m
	4C x 25 sq. mm cable(clamped with 1mm thick saddle) –400 m
	3.5Cx50 sq. mm cable (for LPDB & UDB) -20 m
	4Cx4 sq mm cu flexible cable -500 m
2.17	Supplying and making end terminations with brass compression gland and aluminium lugs for the following sizes of XLPE insulated and PVC sheathed aluminium conducted armoured power cable of 1.1kV grade as required
	4 C x 25 sq. mm cable – 16 nos
	3.5C x 120 sq. mm cable -12 nos
	3.5C x 240 sq. mm cable - 4 nos
	4Cx6 sq mm cable – 80 nos
2.18	Providing maintenance free earthing station of TEREC+ type or equivalent conforming to IS:3043 including supply and installation for 3 Nos of 19 mm dia, 1.8m long, 250 micron copper bounded MS rod, bolts, clamps for connecting rods, TEREC+ compound, Earthcon compound for each pits for 3 each rods including necessary welding and interconnections, earth pit chambers of HEX PVC/SGI/HDPE type with locking arrangement complete as required and as directed by EIC to achieve earth resistance of less than one ohm. **Make :** TEREC+ or equivalent approved make -12 set
	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.-200 m
	Supplying and laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm) – 150 m
	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required. -100 m
	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm) -20 m
	Providing and fixing 4.0 mm dia copper wire on surface or in recess for loop earthing alongwith existing surface conduit / recessed conduit/ submain wiring / cables as required.- 500 m
2.19	SITC of 2x200kVA PRS UPS with battery bank including copper cable for interconnection between main panel to UPS and UPS to output panel, nylon cable between UPS and battery bank. – 1 set
2.20	INTELLIGENT FIRE ALARM SYSTEMSupplying, installation, testing and commissioning of micro processor based intelligent addressable main 2 loop fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 320 character graphics/ LCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5% V, 50 hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger. The panel shall have facility to connect printer to printout log and facility to have seamless integration with

	analog/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories . The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications.Two loop panel.	
	FACP 2 loop panel – 1 no	
	Detectors - 45 nos	
	Isolator - 5 nos	
	MCP - 5 nos	
	Sounders - 5 nos	
	Detector with response indicators - 45 nos	
2.21	Supplying and fixing of 25mm of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required – 900 m	
2.22	Supply and wiring with 2C x 1.5 sq mm FRLS twisted pair shield, 1.1 KV grade PVC insulated un armoured copper conductor cable, PVC overall sheathed cable with ISI certification mark in already embedded conduit / built up trench, interconnections complete as required and as directed by EIC. (Approx 600 m)	
2.23	Supplying and fixing of 25mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc as required. (50 m)	
2.24	Supplying, installation, testing & commissioning of repeater panel wih 320 character/ Touch screen LCD display with inbuilt reset, acknowledge and silence switches complete as required1 no	
2.25	Supply and coating of Fire Resistant Compound of water based thermoplastic resin, Flame Retardant chemicals and inorganic incombustible fibres for coating on the cables to withstand severe Fires and to prevent propagation along horizontally and vertically laid cables on wall or on cable trays under high temperature conditions. The compound shall be similar to "VIPER CABLEMASTIC FR-903" complete as required and as directed by Engineer-in-charge. (To be coated on the cable for 1.5 mtr. length from end terminations and 1 Mtr. length for every 10 mtr. interval of exposed cable) - 10 kg.	
2.26	Cable trays	
	Supplying and installing following size of perforated hot dipped galvanised iron cable tray (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required	
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 300 m	
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 200 m	
2.27	Supplying and installing following size of perforated hot dipped galvanised iron cable tray "bends" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required	
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 10 nos	
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 10 nos	
2.28	Supplying and installing following size of perforated hot dipped galvanised iron cable tray "Tee" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling wiht GI suspenders including GI bolts and nuts etc. as required	

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	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 5 nos
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 5 nos
2.29	Supplying and installing following size of perforated hot dipped galvanised iron cable tray "Cross Member" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) -5 nos
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 5 nos
2.30	Supplying and installing following size of perforated hot dipped galvanised iron cable tray "Reducer" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 5 nos
	300 mm (w) x 50 mm (d) x 1.6 mm(thick)- 5 nos
2.31	Cable management system - 300 m (2 divider 150x40mm)
2.32	GI Floor Race ways (150x30mm) – 300 nos
	Race way inspection type junction box, suitable to draw out the wire from box to furniture.- 50 nos
2.33	5Amp switch / socket 2 sets – 40 nos
2.34	15 Amp switch / socket - 10 nos
2.35	Tempra Socket 32 A(1P+N+E) – 50 nos
2.37	Intelligent dimming system with remote (including controller, dimmer etc.)- 1 set
	North Block, MHA
2.38	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. – 15 nos
2.39	Wiring for group controlled (looped) light point/ fan point/ exhaust fan point/ call bell point (without independent switch etc) with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. Group C -14 no points
2.40	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 6 amps modular socket outlet and 5/6 amps modular switch, connection etc. as required.-20 points
2.41	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 6/16 amps modular socket outlet and 15/16 amps modular switch, connection etc. as required.- 2 no points
2.42	Wiring for circuit/ sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.
	2 X 1.5 sq mm + 1x 1.5 sq mm earth wire – 250 m
	2 X 2 5 sq mm + 1x 2.5 sq mm earth wire – 60 m
2.43	Supply of LED light fittings with integrated driver, Optics, suitable casing, Heat

	sink Including LEDs and other accessories as required with the following detailed specifications: Light source: Height efficiency long life LEDs in integral module and viewing angle of 120 Deg. Avg. Life L 70 / B 50: 50000Hours or more. Electronic driver with short circuit protection, over voltage protection and other safety tests as per IS:15885 Part 2/Sec13.	
	36W full glow LED recessed / surface mounted (2x2) luminary, day light, illumination @> 95 lumen / W rating.-21 nos	
	40w suspended 4' LED light fittings- 4 nos	
	Installation, testing and commissioning of wall bracket / ceiling fittings of all sizes and shapes containing upto two GLS /CFL / LED lamps per fittings complete with all accessories including connections etc. as required.- 25 nos	
2.44	Supplying and fixing of following way, horizontal type three pole and neutral sheet steel MCB distribution board, 415V, on surface/recess complete with tinned copper bus bar neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc as required, including supply and fixing of MCB/RCCB, adapter boxes for incoming and outgoing cables/ wires complete as required and as directed	
	6 Way TPNMCB DB (UDB, LPDB, ACDB) each consisting of Incomer:- 1 nos Four Pole 63A RCBO with 100mA leakage current tripping sensitivity Outgoing :6A - 4 Nos, 16 A - 8 Nos, 20 A - 4 Nos, 25A - 2 Nos (Approximate 4 sets)	
	6 Way VTPNMCB DB (AC) -1 no Incomer : 160A 4P Microprocessor based MCCB-1No. Outgoing : 63A TPN MCB -6NOS (Approximate 2 sets)	
	63A MCCB with junction box (For Precision units) - 6 nos	
2.45	Supply, fabrication, Installation, Testing and Commissioning of 3phase and Neutral 415V, 4 wire Floor mounted Following MV Panel /COP made out of 14SWG MS sheet after seven tank process and fire retardant painting and by incorporating as details given below:	
	1. Cleaning and surface treatment of panel frame and all steel parts of the panel shall be carried out through seven tank process	
	2. After rigorous surface treatment, panel shall be treated with powder coating process.	
	3. Fire retardant paint shall be applied inside the switchgear chambers and bus bar chambers i.e., all interiors of the panel to be painted with similar to VIPER - FR - 001 and VIPER - FR + 1102	
	4. The panel shall have fire retarding DMC/SMC barriers for opening around the bus bar near to the sectional bus barriers	
	5. All terminations shall be made with proper lugs in an approved manner.	
	6. All components, panels, cables etc., shall confirm to relevant IS specifications and shall also be got approved by Engineer In Charge	
	7. The Panels shall have the following:	
	a. High Mechanical and Di-electric strength	
	b. Door interlocking facility for all switchgear cubicles.	
	c. Facility for direct termination of specified size and numbers of armoured aluminium conductor cables.	

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	d. Shall have 50kA short circuit with standard capability.	
	NOTE for MCCBs/MCB:	
	a). All MCCB's shall be provided with required protections for S/C and O/L. The over load protection shall be field selectable. MCCB shall be suitable for horizontal and vertical mounting and with line load reversibility. b). All MCCB's should with stand I_{cs}=100%I_{cu}.	
	All panels shall be provided with aluminium earth strip of suitable size as per IS norms with a provision for connecting earth strip on both sides of panel.	
	Panel shall be got fabricated from the Department approved fabricators / manufacturers. Department approved makes of switch gear are only to be used in all M.V panels.	
	Panel shall be installed on the existing trench / floor with necessary pedestal / channel complete as required and as directed	
	Main MV Panel – 1 set	
	Incomer - 250A FP MCCB(settable), 36 kA symmetrical breaking capacity, with ELR 300 mA to 3000 mA - 2 sets Bus coupler - 250A FP MCCB (settable), 36 kA symmetrical breaking capacity - 1 no	
	Interlock: Mechanical interlocks shall be provided for all the above three MCCBs with 2 keys so that 2 MCCBs are in operation at a time.	
	Bus bar:	
	300A TPN aluminium bus bar -1set	
	Out goings:-	
	a).100A TPN, 36kA rating MCCB- 4 nos	
	b). 63A TPN, 36kA MCCB – 4nos	
	c). 40A TPN , MCB – 2 nos	
	Metering:-	
	Digital Multi-function meter with CTs 250/5A CTs - 1set	
2.46	Supply of 1.1 KV grade, 3.5C/4C, XLPE insulated, and overall sheathed, stranded aluminium conductor, flat steel strip / wire armoured cables conforming to IS:7098/Part - I (with latest amendments) and of following sizes. The cables shall bear ISI certification mark.	
	4C x 25 sq. mm cable (for LPDB & UDB, AC DB)-40 m	
	3.5C x 50 sq. mm cable (AC units) – 100 m	
	3.5C x 120 sq. mm cable (COP to MV panel) – 300 m	
2.47	Laying of cables	
	Laying of one number of XLPE insulated and PVC sheathed power cable of 1.1kV grade of following size on cable tray as required.	
	3.5C x 120 sq. mm cable (clamped with 25 / 40 x 3 mm MS flat clamp)- 300 m	
	3.5 C x 50 sq. mm cable (clamped with 1mm thick saddle) -100 m	
	4 C x 25 sq. mm cable (clamped with 1mm thick saddle)- 40 m	
2.48	Supplying and making end terminations with brass compression gland and aluminium lugs for the following sizes of XLPE insulated and PVC sheathed aluminium conducted armoured power cable of 1.1kV grade as required	
	4 C x 25 sq. mm cable -10 nos	
	3.5 C x 50 sq. mm cable - 6 nos	
	3.5C x 120 sq. mm cable – 4 nos	
2.49	Providing maintenance free earthing station of TEREC+ type or equivalent confirming to IS:3043 including supply and installation fo 3 Nos of 19 mm dia,	

	1.8m long, 250 micron copper bounded MS rod, bolts, clamps for connecting rods, TEREC+ compound, Earthcon compound for each pits for 3 each rods including necessary welding and interconnections, earth pit chambers of HEX PVC/SGI/HDPE type with locking arrangement complete as required and as directed by EIC to achieve earth resistance of less than one ohm. **Make :** TEREC+ or equivalent approved make 4 sets	
	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.-100 m	
	Supplying and laying 25 mm X 5 mm G.I strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with G.I. nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm) - 150 m length	
	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm) – 20 m	
	Providing and fixing 4.0 mm dia copper wire on surface or in recess for loop earthing along with existing surface conduit / recessed conduit/ sub main wiring / cables as required-100 m	
2.50	INTELLIGENT FIRE ALARM SYSTEM Supplying, installation, testing and commissioning of micro processor based intelligent addressable main 2 loop fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 320 character graphics/ LCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5% V, 50 hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger. The panel shall have facility to connect printer to printout log and facility to have seamless integration with analog/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories . The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications.	
	Detectors -10 nos	
	Isolators – 2 nos	
	MCP – 2 nos	
	Sounders-1 no	
	Detector with response indicator-10 nos	
2.51	Supplying and fixing of 25mm of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required – 300 m	
2.52	Supply and wiring with 2C x 1.5 sq mm FRLS twisted pair shield, 1.1 KV grade PVC insulated un armoured copper conductor cable, PVC overall sheathed cable with ISI certification mark in already embedded conduit / built up trench, interconnections complete as required and as directed by EIC.	
2.53	Supplying and fixing of 25mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc. as required – 50 m	
2.54	Supplying, installation, testing & commissioning of repeater panel with 320	

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	character/ Touch screen LCD display with inbuilt reset, acknowledge and silence switches complete as required – 1 no
2.55	Cable trays
	Supplying and installing following size of perforated hot dipped galvanised iron cable tray (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 50 m
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 50 m
2.56	Supplying and installing following size of perforated hot dipped galvanised iron cable tray "bends" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) -5 nos
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 5 nos
2.57	Supplying and installing following size of perforated hot dipped galvanised iron cable tray "Tee" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 3 nos
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 3 nos
2.58	Supplying and installing following size of perforated hot dipped galvanised iron cable tray "Cross Member" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 4 nos
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 4 nos
2.59	Supplying and installing following size of perforated hot dipped galvanized iron cable tray "Reducer" (galvanization thickness not less than 50 microns) with perforation not more than 17.5% in convenient sections, joined with connectors, suspended from the ceiling with GI suspenders including GI bolts and nuts etc. as required
	150 mm (w) x 50 mm (d) x 1.6 mm(thick) – 6 nos
	300 mm (w) x 50 mm (d) x 1.6 mm(thick) – 6 nos
2.60	Cable management system - 100 mtr (2 divider 150x40mm)
2.61	GI Floor Race ways (150x30mm) – 100 nos
	Race way inspection type junction box, suitable to draw out the wire from box to furniture. -10 nos
2.62	5Amp switch / socket 2 sets – 10 nos
2.63	15 Amp switch / socket -2 nos
2.64	Tempra Socket 32 A(1P+N+E) – 4 nos
2.65	4Cx4sqmm Flexible cable – 100 m
2.66	Intelligent dimming system with remote (including controller, dimmer etc.) – 1 set

2.67 Terms & Conditions, Specifications - Electrical

SNo	Item type
1.1	**Drawings:** The work shall be carried out in accordance with the drawings enclosed with the RFP documents and also in accordance with modification thereto from time to time as approved by the Engineer-in-charge. All wiring diagrams shall be deemed to be 'Drawings' within the meaning of the term as used. They shall indicate the main switch board, the distribution boards (with circuit numbers controlled by them), the runs of various mains and sub-mains and the position of all points with their controls. All circuits shall be indicated and numbered in the wiring diagram and the points shall be given the same number as the circuit to which they are electrically connected.
1.2	**Conformity to IE Act, IE Rules, and Standards:** All Electrical works shall be carried out in accordance with the provisions of Indian Electricity Act, 2003 and Indian Electricity Rules, 1956 amended up to date (Date of call of tender unless specified otherwise). List of Rules of particular importance to Electrical Installations under these General Specifications is given in Appendix C for reference. General Requirements of Components
1.3	**Quality of Materials** All materials and equipments supplied by the contractor shall be new. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.
1.4	**Inspection of Materials and Equipment** Materials and equipment to be used in the work shall be inspected by the Departmental officers. Such inspection will be of following categories: Inspection of materials/ equipment to be witnessed at the manufacturer's premises in accordance with relevant BIS/ Agreement Inspection Procedure. To receive materials at site with Manufacturer's Test Certificate(s). To inspect materials at the Authorized Dealer's godowns to ensure delivery of genuine materials at site. To receive materials after physical inspection at site. The Departmental officers will take adequate care to ensure that only tested and genuine materials of proper quality are used in work. Similarly, for fabricated equipment, the contractor will first submit dimensional detailed drawings for approval before a action taken up in the factory. Suitable stage inspection at factory also will be made to ensure proper use of materials, workmanship and quality control. The tender specifications will stipulate the inspection requirements or their waiver for various materials/ equipment including norms of inspection in specific cases.
1.6	**Conformity to Standards** All components shall conform to relevant Indian standard specifications, wherever existing. Materials with ISI certification mark shall be preferred. A broad list of relevant Indian Standards is given in Appendix D. These Indian Standards, including amendments or revisions thereof up to the date of tender acceptance, shall be applicable in the respective contracts.
1.7	**Interchange ability** Similar parts of all switches, lamp holders, distribution fuse boards, switch gears, ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchangeable in each installation.

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1.8	**Workmanship** Good workmanship is an essential requirement to be complied with. The entire work of manufacture/fabrication, assembly and installation shall conform to sound engineering practice.
2	**Power distribution and wiring** Recessed conduit is suitable for this works. However, surface conduit work may be adopted above false ceiling/below false flooring, and at locations where recessed work may not be possible to be done. Flexible conduits may only be permitted for interconnections between switchgear, DBs and conduit terminations in wall.
2.1	**Wiring for lighting** Wiring for light point with 1.5sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit with modular switch, modular plate, suitable GI box and earthling the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable for loop earthling as required.
2.2	**Wiring for power points** Wiring for light point with 2 x 4 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit with modular switch, modular plate, suitable GI box and earthling the point with 4.0 sq.mm FRLS PVC insulated copper conductor single core cable for loop earthling as required.
2.3	**Lighting** LED light fittings shall be provided as per the requirement of false ceiling / drawing. Necessary occupancy cum lux sensor shall also to be provided.
2.4	**Cable Management system & Floor Raceways** The mini trucking and adaptable trucking shall be of the same material, viz. either PVC or anodized aluminium in extruded sections. The mini trunking shall have a square or rectangular body. The trunking cover shall be "CLIP-ON" type with double grooving in the case of PVC wire-ways, and CLIP-ON type for the metallic wire ways. All surfaces shall have smooth finish inside and outside. The top of the side walls of the body shall be suitable for the above types of fixing arrangement of trucking. PVC trucking should have uniform thickness throughout its length and shall be of factory finish. PVC trucking shall be of good quality PVC, free from defects like deformation, unevenness, blisters, cavities etc. Floor Raceways shall be of stainless steel make and to be provided in the floor as to extend power distribution and network distribution.
2.5	**Earthing Requirements** The entire system of metallic conduit work, including the outlet boxes and other metallic accessories, shall be mechanically and electrically continuous by proper screwed joints, or by double check nuts at terminations. The conduit shall be continuous when passing through walls or floors. A protective (loop earthing) conductor(s) shall be laid inside the conduit between the metallic witch boxes and distribution switch boards and terminated with proper earthings/ terminals. Only PVC insulated copper conductor cable of specified size green in colour shall be allowed. The protective conductors shall be terminated properly using earth studs, earth terminal block etc. as the case maybe.
2.6	**False Ceiling Coordination** False ceiling electrical layout will be coordinated for symmetrical and aesthetic layout

	of the following: ➢ Light fittings ➢ Air-conditioning diffusers ➢ Fire / Smoke Detectors ➢ Cable Management systems **Installation of Cables** For ease of maintenance, cables carrying direct current or alternating current shall always be bunched so that the outgoing and return cables are drawn in the same trucking. Mini trucking shall be of such a design that it holds the wires inside the trucking body (casing) at suitable intervals, so that at the time of opening of the trucking cover (capping), the wires may remaining position in the trucking body (casing) and do not fall out. **Earth Continuity** A protective (earth continuity) conductor shall be drawn inside for earthing of all boxes of the installations as well as for connections to the earth pin of the socket outlets. In the case of metallic trucking there shall be a metallic link between adjacent trunking covers with screw connections, and also connections from the end casing to the earth terminal of metallic boxes/outlets/switch boards as per the case may be, for the complete body earthing of the system.
3.0	**MV Panel and Distribution Boards**
3.1	**Specification of LT Cubicle Panel (MV Panel)** Cubicle panel shall be floor mounted (on a base frame) totally enclosed and extensible type.:93. The design shall include all provisions for safety of operating and maintenance personnel. Degree of IP protection shall be IP-42 for indoor application and IP-54 for outdoors, unless otherwise specified. The panel shall be compartmentalized type having space and arrangement for incoming cable/ bus ducting, incoming switchgear/ switchgears, bus coupler, insulated and properly supported compartmentalized bus bars, outgoing compartmentalized switchgear, bus bar supports, joint shrouds, cable alleys of suitable size for cabling routing, support and terminations, inter-connection between bus bars and switchgear with auxiliary bus bars/ insulated conductors/ strips etc. Also the panel will be provided with necessary instrumentation like CTs, PTs, Ammeters, Voltmeters, phase indicating lamps, other required instruments, wiring, fuses etc. It shall be fabricated out of CRCA sheet not less than 2.0 mm thick for load bearing members and 1.6 mm for doors of LT panels. The framework may be Angle Iron/Channel/Bolted type construction. General constructions shall employ the principle of compartmentalization and segregation of each circuit. Unless otherwise approved, incomer and bus section panels shall be separate and independent and shall not be mixed with sections required for feeders. Each section of the rear accessible type board shall have in access door at the rear. Operating handle of the highest unit shall be at a height not more than 1.7 mt. Overall height of the board shall not exceed 2.3metre. **Arrangement for Incoming/Outgoing Cable Termination** Cable entries shall be provided either from the rear or from the front through cable alleys of suitable size. Removable gland plate to be provided for each cable entry. Cable support arrangement to be provided inside cable alley so that cables are neatly arranged and fixed. From each outgoing switch, insulated strip/ conductor of suitable size to be provided up to suitable terminal block, which will receive incoming/outgoing cable termination. It is desirable that cables are not terminated directly to switchgear,

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but terminated through proper terminal blocks.

Specification of Cable Terminal Block

Terminal block of reputed make shall be used. The housing material shall be polyamide having unbreakable and fire-retardant characteristic. All the metal parts shall be made up of copper alloy including the screws. Mounting shall be 'Din' or 'G-rail' type. Screws shall be self-captive type. No protection cover is required, and the block should be touch proof.

Bus bars/ Supports/ Clearances

The bus bar system may comprise of a system of main/ auxiliary bus bars run in bus bar alleys.

Rating

Bus bars shall be made of wrought aluminium or aluminium alloy, or electric grade copper, conforming to relevant Indian Standard, as specified. The ratings of the bus bars shall be 100A, 200A, 300A, 400A, 500A, 600A, or 800A as specified.

Current Density

Bus bars shall be of sufficient cross-section so that a current density of 130A/ sq.cm (800A/sq.inch) is not exceeded at nominal current rating for aluminium bus bars, and 160A/sq.cm (1000A/squint) for copper bus bars. The minimum sizes of sections of bus bars are given in Table VI.

Cross Section of Bus Bars

The cross section of the neutral bus bar shall be the same as that of the phase bus bar for bus bars of capacities up to 200A; for higher capacities, the neutral bus bar must not be less than half the cross-section of that of the phase bus bar.

Insulation

Each bus bar shall be suitably insulated with PVC sleeves/ tapes.

The insulation of the rising mains shall be capable of withstanding the voltage of 660 V of AC.

Bus Bar Supports

Bus bar support insulators shall be class F insulators made of non- hygroscopic, non-combustible, track resistant and high strength FRP/ SMC/ DMC material, and shall be of suitable size and spacing to with-stand the dynamic stresses due to short circuit currents. The spacing between two insulators should be provided by the manufacturers according to the design approved by CPRI for their bus bar supports.

Bus Bar Clearances:

The minimum clearance to be maintained for enclosed indoor air insulated bus bars for medium voltage applications shall be as follows:

Phase to earth	26 mm
Phase to phase	32 mm

Bus bar joints shall be thoroughly cleaned and suitable oxidizing grease shall be applied before making the joint.

High tensile bolts, plain and spring washers shall be provided to ensure good contact at the joints.

The overlap of the bus bars at the joints shall be not less than the area of the cross section of the bus bars.

Earthing:

2 Nos. 20 x 3 mm copper strip for LT panel up to 400 Amp. Capacity or 2 Nos. 20x5mm copper strip for LT panel of higher capacity shall be fixed all around the panel connected to 2 Nos. earth bus copper strips connected to incoming earth conductors.

Commissioning

After erection, the LT panel will be commissioned after:

	Tightening of all nuts and bolts. Closing any left out holes to ensure the entire panel is insect proof. Mugger testing. Earth testing
3.2	**Specification of Prewired DB** Prewired DBs shall have following features: Recess/ Surface type with integral loose wire box. Phase/neutral/earth terminal blocks for termination of incoming & outgoing wires. Din Channel for mounting MCBs. Arrangement for mounting incomer MCB/ RCCB/ RCBO/ MCCB as required. Copper Bus bar. Earthing terminals. Wiring from MCBs to phase terminal block. Inter connection between terminal block/incoming switch/ bus bar /neutral terminal block/ earth terminal connector with specified size of FRLS pre-insulated copper conductor cable duly fitted with copper lugs/thimbles. Terminal blocks should be suitable for termination of conductor/ cable of required size but minimum rated cross section of the terminal blocks should be 6 sq.mm. Terminal block shall be made of flame retardant polyimide material. Colour terminal blocks and FRLS wires for easy identification of RYB Phases, Neutral and Earth. Prewired DB shall be provided with a detachable cassette for safe removal of MCBs, RCCBs. Terminal connectors from the DB without loosening the internal cable connections of phase and neutral circuits. The prewired DB shall have peel able poly layer on the cover for protection from cement, plaster, paints etc. during the construction period. Detachable plate with Knock out holes shall be provided at the top/ bottom of board. Complete board shall be factory fabricated and pre-wired in factory ready for installation at site. The box and cover shall be fabricated from 1.6mm sheet steel, properly pre-treated, phosphatised with powder coated finish. Where specified it shall be of double door construction provided with hinged cover in the front. Note: Prewired DB will be factory manufactured by reputed manufacturer of MCB DBs. **Earthing** Earthing requirements are laid down in Indian Electricity Rules, 1956, as amended from time to time, and in the Regulations of the Electricity Supply Authority concerned. These shall be complied with. **Earth Resistance** The earth resistance at each electrode shall be measured. No earth electrode shall have a greater ohmic resistance than 5 ohms as measured by an approved earth testing apparatus. In rocky soil the resistance may be up to 8ohms. Where the above stated earth resistance is not achieved, necessary improvement shall be made by additional provisions, such as additional electrode(s), different type of electrode, or artificial chemical treatment of soil etc. ,as may be directed by the Engineer-in-charge. **Use of Residual Current Devices(RCDs)** Provision of RCD shall be required in individual cases keeping in view the type, use, importance, system of earthing and nature of electrical installations to be protected by

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the RCCBs, requirements of the local electric supply company, etc. The sensitivity shall be 30 mA, 100 mA, 300 mA, or 500 mA, as specified.

4.0 CABLE WORKS

1.1 kV grade XLPE insulated 3core / 3.5Core / 4core aluminum /copper conductor cables confirming IS 7098 part I. Cable shall be laid along the wall / tray above false ceiling as per the requirement.

5.0 UPS

To meet the requirement of no break power supply for requirements like computer/ communication/ security/ life safety needs etc. it is necessary to provide for 2 x 200kVA Parallel Redundant UPS system with 30 minutes back up.

Detailed Technical Specifications

1. General

The UPS system consists of 2 nos. of 200 KVA UPS systems connected in parallel redundant load sharing mode. In the event of failure of the one UPS system, the load shall be passed on to the parallel redundant system. If the second system also fails, the load shall be automatically passed on to the bypass (normal supply) through static bypass switch without any break. Suitable isolation shall be provided for EB neutral and UPS neutral. The work also includes related cabling/earthing. (2 Nos neutral earthing with necessary interconnection with system neutral with 2 runs. of 6 SWG copper wire or suitable size of insulated copper wire etc). The scope also includes copper cabling between UPS, battery bank & also between input sources of power supply and output switch. The UPS shall conform to IS 16242 (with latest amendments/ IEC 62040/ EN 50091 standards.

2. System Description

The system should consist of the following major components

i) Solid state static PWM converters utilizing IGBT.

ii) Solid state static PWM Inverters utilizing IGBT

iii) Sealed high rate discharge maintenance free valve regulated lead acid battery bank (VRLA) for **30 minutes** back up time.

iv) Converter input, bypass input and system battery breaker/ contactor, inverter output breaker/ contactor and static bypass switch with primary contractor, converter input and system input fuses etc.

v) Maintenance bypass utilizing wrap around contactor

Modes of Operation: The system should be designed to operate continuously at rated capacity

i) **Normal Operation**: The inverter shall continuously supply stable AC power to the critical load. The converter should be able to feed power to a fully loaded inverter as well as recharging the system with fully discharged battery simultaneously if required.

ii) **Battery Operation**: In the event of commercial AC failure, the inverter shall derive the input from the system battery without any break.

iii) **Recovery charge**: Subsequent to restoration of commercial AC. Power and prior to the system battery final voltage, the converter shall automatically re-activate and provides DC power to the inverter, simultaneously recharging the battery system without any interruption.

iv) **Bypass supply:** In the event of inverter failure, the critical load shall be transferred to the bypass source via the static switch without interruption of power to the critical load provided. Manual re-transfer arrangement shall be made in the system to transfer the load from bypass to inverter without any break after attending the fault in the system.

v) **Maintenance bypass operation (Super bypass)**: In case of

maintenance or repair has to be performed on the UPS, load shall be powered from bypass source through maintenance by pass switch. The power shall be transferred from inverter to normal bypass and maintenance bypass or vice versa without interruption by manual operation. After transferring the load to maintenance bypass, system shall be free from all aspects i.e. switching OFF, switching ON, attending faults etc.

4.0 Technical Specifications

4.1. Input (Charger/Converter)

Input voltage	:	415V AC + 15%, -25%
Input frequency	:	50 Hz ± 5%
Power walk in	:	10 to 100% in 20s
Power factor at rated load	:	0.95
Input harmonic current (THD)	:	3% typical at 100% load 5% typical at 50% load

4.2. DC Characteristics

Battery type	:	Sealed high rate discharge maintenance free Valve Regulated Lead Acid (VRLA)
Backup time	:	**30 minutes (each bank 15 mins)**
Float charge voltage	:	2.25 Volt per cell
End of battery voltage	:	1.70Volts per cell
Voltage stability of the rectifier	:	± 1%
Ripple voltage (with battery)	:	Less than 1% disconnected)
Battery charging cycle	:	Boost/ float charging with current limit & boost time limiter

4.3 Input (Bypass)

Configuration	:	3 Phase, 4 wire
Input voltage	:	415V ± 15%
Frequency	:	50 Hz ± 5%
Over load on bypass static switch	:	100% rated current rated continuous and10 times rated current for 20 ms.
No break transfer	:	UPS system shall have logic circuit to sensing the following conditions and transfer the loads from module to bypass without break Inverter output under voltage/ over voltage Overload beyond the capability of the Inverter DC Circuit under voltage or over voltage

Note: System shall have maintenance bypass switch arrangement to transfer the entire load through a make before break mechanical bypass switch for attending periodical maintenance etc. on the system

4.4 Output (Inverter)

Configuration	:	3-phase, 4 wire
Output rating	:	200 kVA
Load power factor	:	0.8 lag to unity

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Voltage	:	415V
Voltage regulation	:	a) ± 1% for unbalanced load b) DC input voltage varies from Max. to Min.
Manually adjustable Output Voltage	:	± 5% of nominal voltage
Frequency	:	± 0.01 Hz with bypass unsynchronized operation
Synchronizing range with bypass		± 5% (Selectable at Various levels)
Overload	:	110% for 60 minutes 125% for 10 minutes 150% for 1 minute
Non-linear load permissible	:	100% load with crest factor 3
Voltage transient fluctuation	:	± 3% for 100% step load change ± 1% for loss or restoration of AC input ± 3% for transfer from bypass to inverter
Voltage transient recovery	:	Less than 20 ms
Voltage unbalance	:	± 2% for unbalanced
Voltage Phase angle displacement	:	± 1 Degree for balanced loads ± 2 Degree for unbalanced loads
Total Harmonic Distortion	:	Less than 3% THD with 100% linear loads Less than 4% THD with 100% non-linear loads
Efficiency (Total system)	:	Better than 91%
Duty Cycle	:	Continuous
No Break transfer	:	In the event of failure of the loaded inverter, the system shall be able to transfer the total load on the other module Which is working under Parallel redundant by mode without any interruption

4.5Earthing:

Providing earthing for the neutral as per standards suitable to meet the site conditions and as directed and required by Engineer-in-charge.

4.6 Environment

Operating Temperature	: 0 to 40°C
Relative Humidity	: 5% to 95% Maximum
Altitude	: up to 1000 MSL
Storage temperature	: 20°C to + 70°C

	5.0 Mimic Display. Mains available Rectifier operative Inverter operation Battery voltage OK Bypass supply OK Load on bypass Load on inverter, Fault Codes etc. **6.0 Alarms** Inverter OFF/ failed Rectifier OFF/failed Emergency Stop Over temperature Over load **7.0 Metering** To select and monitoring the following through LED/ LCD display:- Output voltage Output Current Output Frequency Battery voltage Battery charge /discharge current Input voltage, current and frequency **8.0** System shall have microprocessor based diagnostics and monitoring facility. **9.0** System shall have RS 232 serial Port computer capability/ RS 485 for Local LAN network. **10.0** Fuse link protection for input and the static bypass switches **11.0**UPS cabinet shall be composed of a free standing steel type enclosure complying with IP 20. **12.0** Cable entry should be from the bottom of the cabinet **13.0** Inter Cell connectors should be of lead coated Copper Strip and all links should carry maximum discharge current when UPS is on full load. **14.0** A powder coated battery cabinet of IP- 20 standard with sufficient ventilation shall be provided to house the batteries. **15.0** UPS shall have provision for integration with BMSat a later date.
6.0	**ADDRESSABLE SMOKE DETECTION AND ALARM SYSTEM** Fire Alarm control panel Manual call bell points Smoke Detectors Heat Detectors Sounders Power supply and wiring

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2.8 Drawings for Electrical

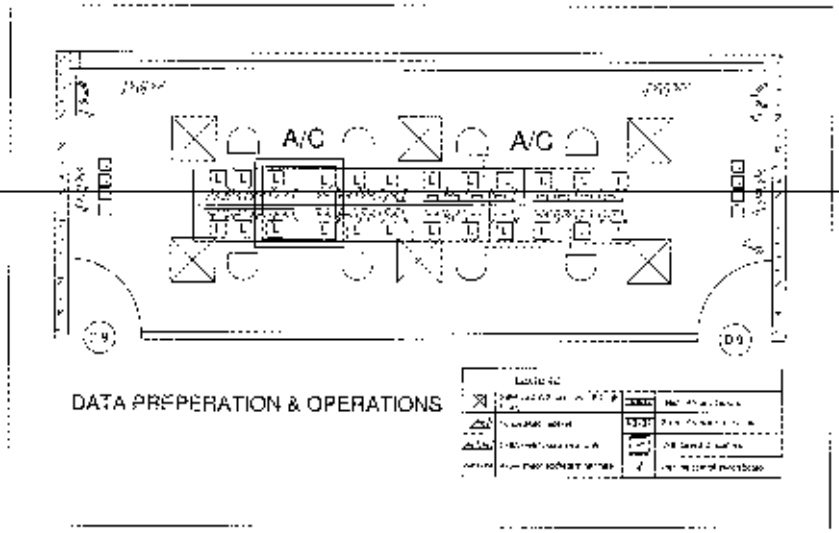

Figure 3. Data Preparation & Operations – DM

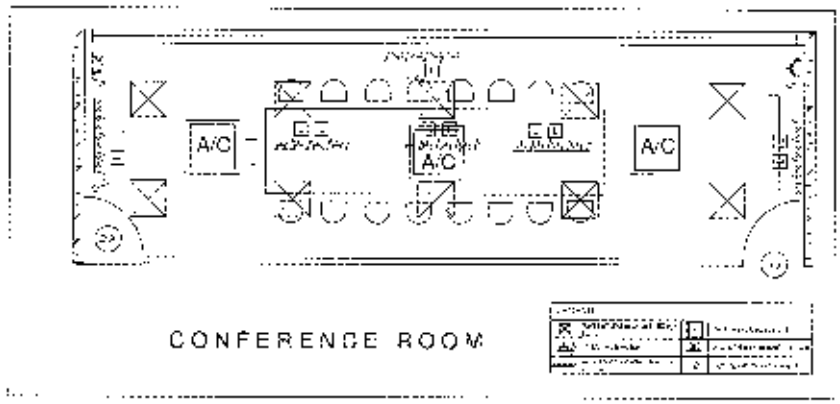

Figure 4. Conference Hall

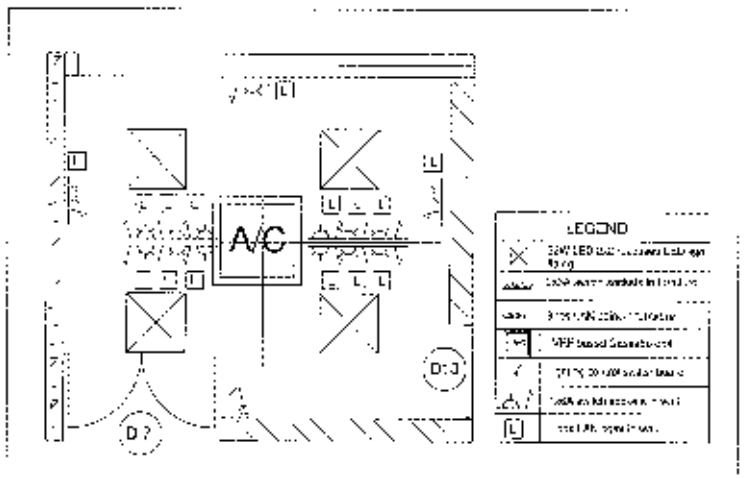

Figure 5. Data Preparation - IS

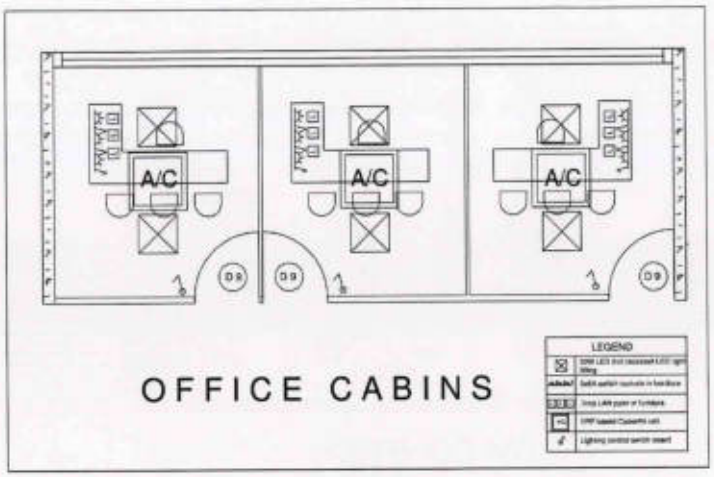

Figure 6. Office Cabins

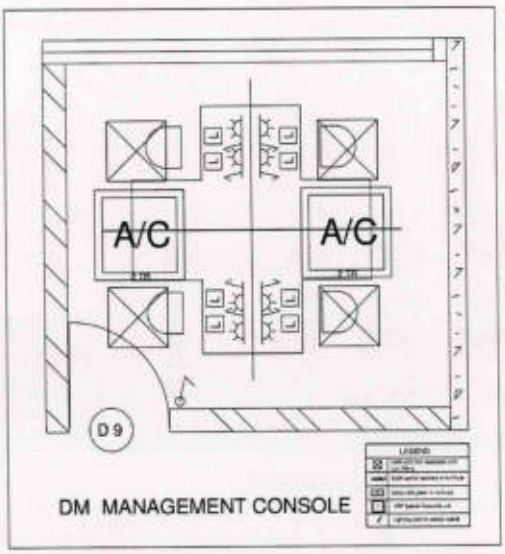

Figure7. Data Management

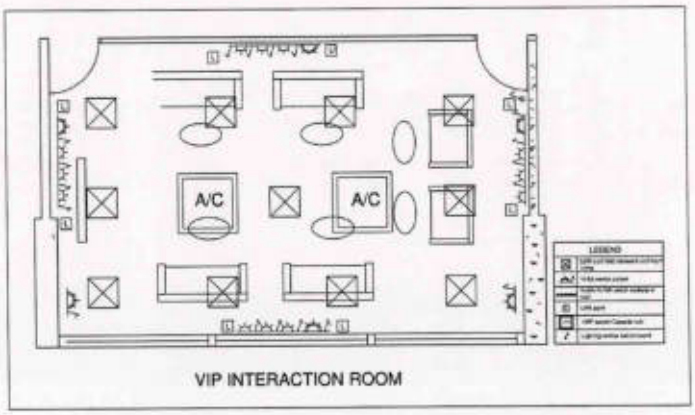

Figure 8. VIP Interaction Room

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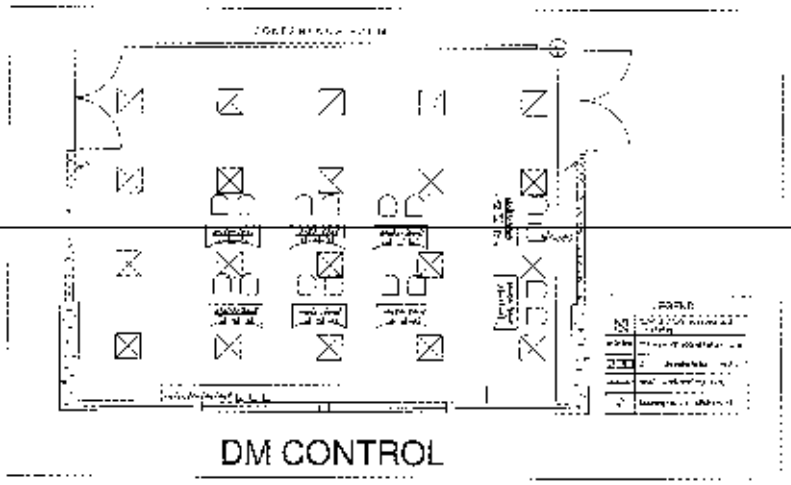

Figure 9 . DM Control Room

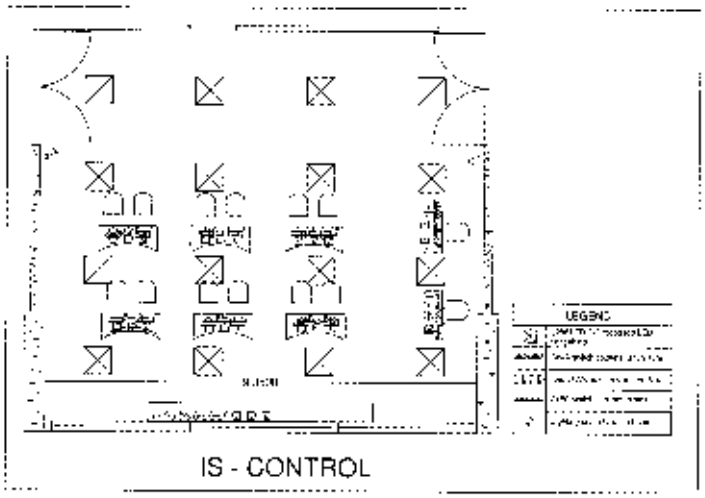

Figure 10. IS Control Room

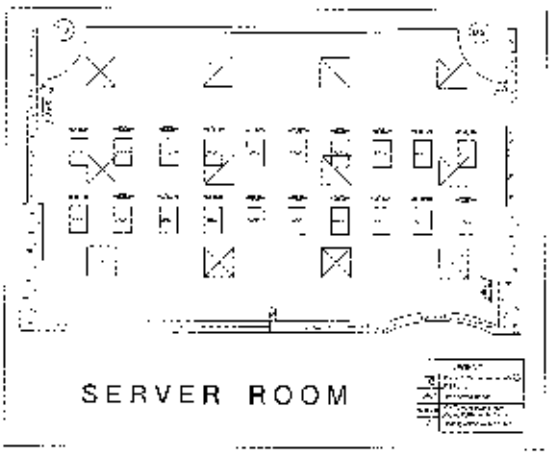

Figure 11. IS Control Room

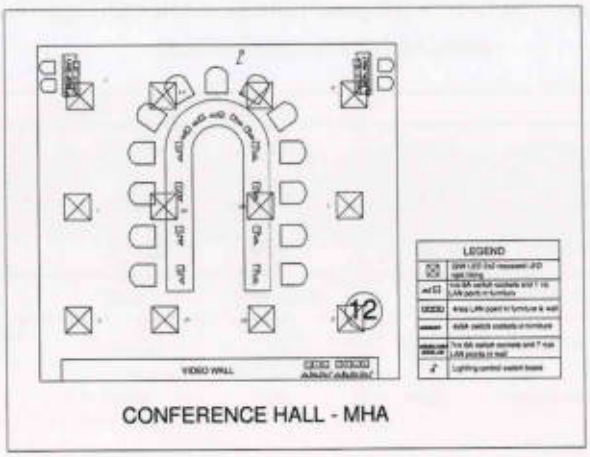

Figure 12. Conference Room - IS, North Block

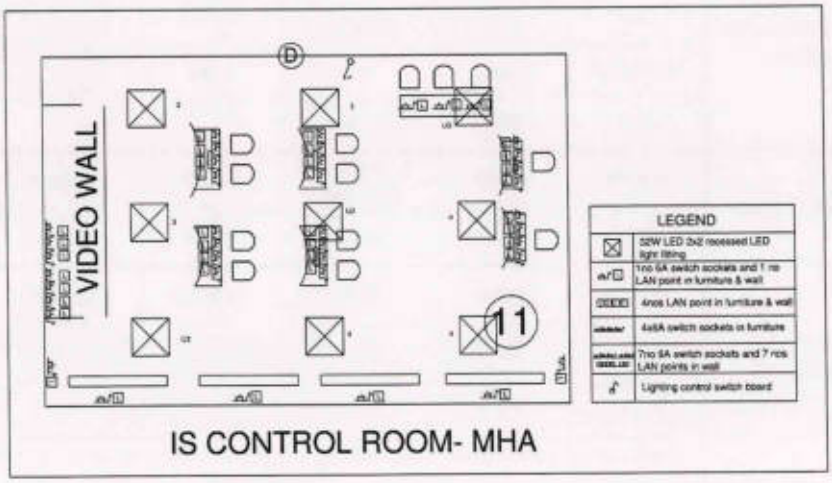

Figure 13. Control Room, IS, North Block

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LIST OF APPROVED MAKES FOR ELECTRICAL WORKS W.E.F. 01-10-2017
(AMENDED ON 23-11-2017)

Sl. No.	Items/ Products	Name of Brand / Make					
1	PVC Wires	CAPP INDIA	FINOLEX	GLOSTER	ANCHOR	KEMDAN CMB	DARSHAN PLUS
		POLYCAB	STANDARD	RALLISON	EON	MYSOCABLES	RAJANGANDHA CABLE
		V-GUARD	RR-KABEL	AVOCAB	Q-FLEX	RHINO	L&T
2	Modular Switches & 5A/15A Sockets	LEGRAND	ABB	CRABTREE	GELCO	LISHA	NORTH-WEST
		STANDARD	L&T	ROMA (ANCHOR)	UTASKI	PROSWITCH (FINOLEX)	TOYAMA
		SCHNEIDER	HAGER	MK	VEGA	KOLORS	EON
		SALZER					
3	Sockets & Plugs (with Polycarbonate/FRP/ Metal Clad Body)	ABB	MENNEKES	LEGRAND	HAVELLS	NORTH-WEST	BCH-ELECTRIC
		SCHNEIDER	HONGEL	STANDARD	CYCLO	BEST & CROMPTON	CROMPTON GREAVES
4	Modular Electronic Fan Regulators	LEGRAND	STANDARD	CRABTREE	GELCO	LISHA	NORTH-WEST
		ABB	L&T	ROMA (ANCHOR)	TOYAMA	PROSWITCH (FINOLEX)	RIDER (ANCHOR)
		SCHNEIDER	HAGER	MK	VEGA	CROMPTON GREAVES	KOLORS
		EON	UTASKI	SALZER			
5	Light fittings (Indoor)#	PHILIPS	OSRAM	ENDO LIGHTING	ISUZZINI	JAQUAR	LIGHTING TECHNOLOGIES
		WIPRO	TRILUX	BAJAJ	SURYA	HAVELLS	CROMPTON GREAVES
6	Light fittings (Outdoor applications only)#	PHILIPS	OSRAM	BAJAJ	ISUZZINI	SCHRÖDER	ENDO LIGHTING
		WIPRO	TRILUX	K-LITE	SURYA	HAVELLS	LIGHTING TECHNOLOGIES
		HALONIX	JAQUAR	DISANO	CROMPTON GREAVES		
		# LEDs SHALL BE OF NICHIA, CREE, OSRAM, PHILIPS LUMILEDS, CITIZEN & SEOUL SEMICONDUCTORS MAKE ONLY					
7	Decorative/Special Streetlight Pole	BAJAJ	ASTER	K-LITE	TRANSRAIL LIGHTING		
8	FRP/GRP Poles	SHIMP COMPOSITES	BAJAJ				
9	Lamps, Controlgears & accessories	PHILIPS	OSRAM	WIPRO	SURYA	BAJAJ	HAVELLS
		CROMPTON GREAVES					
10	Lighting Management System	SCHNEIDER	LUTRON	PHILIPS	HONEYWELL	WIPRO	
11	Lighting Control Sensor	HONEYWELL	SCHNEIDER	LUTRON	WIPRO	PHILIPS	LEGRAND
12	Solar Streetlight (Standalone)	PHILIPS	BAJAJ	TATA POWER	ANY MORE APPROVED VENDOR IN CURRENT YEAR		

Sl.No.	Items/ Products	Name of Brand / Make					
13	Emergency Light Fittings with self-contained Batteries	PHILIPS	BPL	EVEREADY	WIPRO		
14	Electronic time switch, Time delay relay, Timer	LEGRAND	L&T	HAGER	BCH-ELECTRIC	THEBEN	SIEMENS
		SCHNEIDER	GE POWER CONTROLS	ABB	HAVELLS		
15 a	Ceiling Fans (Star Rated)	USHA	ORIENT	KHAITAN	BAJAJ	HAVELLS	FALLIFAN
		CROMPTON GREAVES					
15 b	BLDC Ceiling Fans	VERSA DRIVES					
16	Wall mounted / Pedestal Fans	USHA	ORIENT	KHAITAN	BAJAJ	HAVELLS	FALLIFAN
		CROMPTON GREAVES					
17	Exhaust Fans	USHA	KHAITAN	POLAR	EPC	CROMPTON GREAVES	V-GUARD
		ORIENT	CATA-C				
18	Air Circulators	ALMONARD	KHAITAN	EPC	BAJAJ	CROMPTON GREAVES	
19	Flameproof luminaires (Including LED) & Controlgears	BALIGA	FCG	STAHL	FLEXPRO	BAJAJ	SUDHIR SWITCHGEAR
20	Flameproof Switchgear & Accessories	BALIGA	FCG	STAHL	FLEXPRO	SUDHIR SWITCHGEAR	
21	Geysers (Star Rated)	AO SMITH	JAQUAR	RACOLD	V-GUARD	VENUS	USHA
		JOHNSON	REMSON	CROMPTON GREAVES			
22	HRC Fuses	L&T	SIEMENS	GE POWER CONTROLS	C&S ELECTRIC	HAVELLS	INDO ASIAN
		CROMPTON GREAVES	STANDARD				
23	HRC Fuse Base & Carriers	L&T	SIEMENS	ABB	GE POWER CONTROLS	HAVELLS	STANDARD
		SCHNEIDER					
24	MV Switch fuse units & Isolators up to 250A	L&T	SIEMENS	ABB	HPL	INDO-ASIAN	GE POWER CONTROLS
		C&S ELECTRIC	HAVELLS	SCHNEIDER	STANDARD		
25	MV Switch Fuse Units & Isolators of all ratings	L&T	SIEMENS	ABB	SCHNEIDER	GE POWER CONTROLS	
26	Changeover Switches	L&T	SIEMENS	SCHNEIDER	HPL	GE POWER CONTROLS	INDO-ASIAN
		C&S ELECTRIC	STANDARD	HAVELLS			

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Sl.No.	Items/ Products	Name of Brand / Make					
27	Miniature Circuit Breakers (MCBs) & Distribution Boards	LEGRAND	SCHNEIDER	ABB	GE	INDO ASIAN	SAFELINE
		L&T	HAVELLS	HPL	STANDARD	NORTH WEST	HAGER
		C&S ELECTRIC	SIEMENS				
28	Earth Leakage Circuit Breakers (RCBO/RCCBs)	LEGRAND	SCHNEIDER	ABB	GE	L&T	INDO ASIAN
		SIEMENS	HAVELLS	HPL	STANDARD	NORTH-WEST	SAFELINE
		HAGER	C&S ELECTRIC				
29	Moulded Case Circuit Breakers (MCCBs) up to 400A	SCHNEIDER	L&T	LEGRAND	HAVELLS	STANDARD	C&S ELECTRIC
		ABB	SIEMENS				
30	Moulded Case Circuit Breakers of all ratings	SCHNEIDER	L&T	ABB	LEGRAND	SIEMENS	GE
31	Surge Protection Devices (SPDs)	OBO BETTERMANN	LEGRAND	SCHNEIDER	SIEMENS	ABB	ERICO
		DEHN					
32	LT Air Circuit Breaker (ACB)	SCHNEIDER	L&T	ABB	SIEMENS	GE	C&S ELECTRIC
		LEGRAND					
33	3.3kV Vacuum Circuit Breakers (VCB)	SCHNEIDER	L&T	ABB	SIEMENS	EASUN REYROLLE	ANDREW YULE
		MB	BHEL	CROMPTON GREAVES			
34	Transformers (Oil-cooled)	PETE-HAMMOND	SCHNEIDER	BHARAT BIJLEE	ESSENAR	ECE INDUSTRIES LTD.	KEL
		KAVIKA	CROMPTON GREAVES	VOLTAMP			
35	Transformer (Resin Cast, Dry type)	BHEL	VOLTAMP				
36	FR3 Natural Ester Transformer oil	CARGILL					
37	LT Current/Voltage Transformer	NIPPEN	PARAS	INTRANS	KAPPA ELECTRICALS	AUTOMATIC ELECTRIC (AE)	NEUTRONICS MANUFACTURING COMPANY
38	HT Current /Voltage Transformer	SCHNEIDER	INTRANS	PARAS	AE	KAPPA ELECTRICALS	AUTOMATIC ELECTRIC (AE)
		VOLTAMP					
39	Automatic Voltage Regulators (AVR) / Servo-Controlled Voltage Stabilizers (SCVS)	AUTOMATIC ELECTRIC (AE)	SERVOMAX				
40	Diesel Engine for DG sets	CUMMINS	PERKINS	VOLVO PENTA	CATERPILLER	MTU	

Sl.No.	Items/ Products	Name of Brand / Make					
41	LT Alternators for DG sets	STAMFORD-AVK	LEROY SOMER	CROMPTON GREAVES			
42	HT Alternators for DG sets	STAMFORD-AVK	TDPS	LEROY SOMER	CROMPTON GREAVES		
43	DG Set Controller for Synchronising Panel	WOODWARD	BERNINI	DIOF			
44	Armoured HT power cable (PVC & XLPE)	UNISTAR	GLOSTER	POLYCAB	HAVELLS	RPG	CCI
		TORRENT	KEI	FINOLEX			
45	Armoured LT power cable (PVC & XLPE)	UNISTAR	GLOSTER	POLYCAB	HAVELLS	RPG	CCI
		TORRENT	KEI	FINOLEX	RHINO	RAVIN	BONLON
		VICCO	SINCO	TERA	THERMO CABLES	UNICAB	V-GUARD
		RALLISON	AVOCAB	CRYSTAL CABLES	ELKAY	GEMSCAB	INDOCAB
		CORDS CABLE	INSUCON				
46	Armoured/ Unarmoured control cable (PVC & XLPE) & special purpose cables	LAPP	GLOSTER	POLYCAB	HAVELLS	UNISTAR	RPG
		CCI	TORRENT	FINOLEX	RALLISON	ADVANCE CABLES	
47	Armoured/ Unarmoured Telephone Cable	POLYCAB	HAVELLS	RPG	FINOLEX	GEMSCAB	UNICAB
		V-GUARD	THERMO CABLES	ELKAY	SINCO	VICCO	LAPP INDIA
		ADVANCE CABLE	CORDS CABLE				
48	Heat /Cold Shrinkable Joint Kits (HT & LT)	RAYCHEM	M-SEAL (3M)	MULTI PRESSINGS	GEE SEAL		
49	Double Walled Corrugated HDPE Pipes (for UG Cables)	GAMSON	DURA-LINE	REX POLYEXTR-USIONS			
50	Fire Resistant Coating (FRC)	VIPER	STANVAC	HILTI			
51	LT Power Capacitors	SCHNEIDER	EPCOS	L&T	UNISTAR	SIEMENS	ABB
		KHATAU JUNKER	ASIAN POWER	SPRAGUE	CROMPTON GREAVES		
52	Automatic Power factor Correction (APFC) Relay	SCHNEIDER	L&T	BELUK	POWER MONITOR	PROK DV's	EPCOS

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Sl.No.	Items/ Products	Name of Brand / Make					
53	Measuring Instruments (Analog & Digital meters, Data Loggers & Event Recorders)	L&T	SCHNEIDER	MECO	NEUTRONICS	NIPPEN	CG SCHLUMBERGER
		ELMEASURE	RISHAB	KRYKARD	CIRCUTOR	RIKEN	ALTOMATIC ELECTRIC (AE)
		SATEC	SECURE				
54	Single & Three phase Energy Meters	~~SCHNEIDER~~	~~L&T~~	~~JYOTI~~	LEGRAND	REMCO (BHEL)	CAPITAL POWER SYSTEMS
		SIEMENS	EGE	PROK DY's	CIRCUTOR	NIPPEN	SATEC
		SECURE					
55	Air-break Power / Control Contactors	L&T	ABB	C&S ELECTRIC	SIEMENS	CROMPTON GREAVES	BCH-ELECTRIC
		GE	SCHNEIDER				
56	Push-Button Stations, Key Actuators, Rotary Switches, Toggle Switches, Indicators, Selector Switch	TERNIC	ABB	L&T	SIEMENS	CROMPTON GREAVES	BCH-ELECTRIC
		SCHNEIDER	KAYCEE	JAY	JAINSON	C&S ELECTRIC	GE POWER CONTROLS
		VAISHNAV					
57	Electric Motors	ABB	GE	SIEMENS	KIRLOSKAR	CROMPTON GREAVES	JYOTI
		BHARAT BIJLEE	NGEF	LAXMI HYDRAULICS (LHP)			
58	Starters	L&T	ABB	SIEMENS	SCHNEIDER	BCH-ELECTRIC	GE POWER CONTROLS
		CROMPTON CONTROLS					
59	Soft Starters	ABB	SCHNEIDER	ALLEN-BRADLEY	CROMPTON CONTROLS	SIEMENS	
60	Variable Speed Drives	ABB	SIEMENS	SCHNEIDER	DANFOSS	NELCO	LANDIS & STAEFA
		HITACHI	YERTIV				
61	Protective Relays (Electromechanic & Numeric)	ABB	SIEMENS	L&T	JYOTI	ALIND	BASUN REYROLLE
		SCHNEIDER	C&S ELECTRIC	PROK DY's			
62	Fire Alarm/Smoke Detection System & Control Panels (FACP) & Aspiration System	RAVEL	SECUTRON	HONEYWELL	HOCHIK	NOTIFIER	MORLEY (HONEYWELL)
		SIEMENS	ZITON	EDWARD	TELEFIRE	SIMPLEX	THORN SECURITY
		BST (UTC)	SCHRACK SECONET	FPE LTD.			
63	Flame proof Detection system	FPE LTD.					
64	Gas Detectors, Gas Monitoring System	SUBTRONICS	CROWCON	AMBETRONICS			
65	Cable Management System	OBO BETTERMANN	LEGRAND	MK	CENTAUR	EUBKO	

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Sl.No.	Items/ Products	Name of Brand / Make					
66 a	UPS (of all ratings)	VERTIV	APC	RIELLO	PILLER	EPI	SOCOMEC
66 b	UPS (of rating up to 80 kVA)	SOCOMEC	VERTIV	APC	PILLER	EPI	NUMERIC
		RIELLO					
66 c	UPS (of rating up to 30 kVA) & Inverters	SOCOMEC	VERTIV	APC	PILLER	EPI	NUMERIC
		RIELLO	APLAB	GE	EATON	CONSUL-NEOWATT	KELTRON
		TECHSER POWER					
66 d	UPS (of rating up to 10 kVA) & Inverters	SOCOMEC	VERTIV	APC	PILLER	EPI	NUMERIC
		RIELLO	APLAB	GE	EATON	CONSUL-NEOWATT	KELTRON
		TECHSER POWER	POWER ONE	ENERTEC	DUBAS		
67 a	Modular UPS (of rating up to 80 kVA)	VERTIV	APC	RIELLO	SOCOMEC		
67 b	Modular UPS (of all rating)	VERTIV	APC	RIELLO	SOCOMEC		
68	Solar Inverter / Solar Hybrid UPS	DELTA	REFUSOL	KACO	SMA	OPTIMAL POWER SYNERGY (OPS)	
69	Isolation Transformers	VERTIV	PILLER	ESSENAR	SOCOMEC	APC	ECE INDUSTRIES LTD.
		RIELLO	APLAB	BHARAT BIJLEE	SCHNEIDER	AUTOMATIC ELECTRIC (AE)	VOLTAMP
		NUMERIC					
70 a	Batteries: SMF	EXIDE	AMCO	PANASONIC	AMARA RAJA	SONNENSCHEIN	
70 b	Batteries: Non-SMF	EXIDE	AMCO	PANASONIC	AMARA RAJA		
71	Electrical Bus Ducts	ALL APPROVED LT PANEL MANUFACTURERS					
72	Thermoplastic (Polycarbonate/FRP) / Steel Switch box / Junction Box & Distribution Boards	HENSEL	SPELSBERG	BCH-ELECTRIC	ABB	PYROTECH ELECTRONICS	DEVI POLYMER
		PUSTRON	SAFYBOX	SINTEX			
73	Cable trays (PVC, FRP & GI)	SINTEX	L&T	PROFAB	CABLOFIL (LEGRAND)	OBO BETTERMANN	SUMIP COMPOSITES
		INDIANA	PATNY SYSTEMS				
74	Sandwiched Busbar Trunking System	SCHNEIDER	LEGRAND	GE ENERGY	L&T	C&S ELECTRIC	
75	Lightning Protection Accessories	DEHN	ERICO	OBO BETTERMANN			
76	Unitised/ Package Substation*	ABB	SCHNEIDER	SIEMENS	PETE	VOLTAMP	

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Sl.No.	Items/ Products	Name of Brand / Make					
		*WITH APPROVED MAKES OF HT, LT BREAKERS & TRANSFORMERS					
77	Shock-Proof Insulation Mat & Paint	SAFEVOLT	STANVAC	ELECTROMAT	TATA RUBBER CORPORATION	HILTI	
78	Fire Stop Products	3M	HILTI				
79	Maintenance-free earthing kit with solid earth electrode & Earth Enhancing Compound	OBO BETTERMANN	TERECO (SGI)	ERICO (GEM)	LOREES	ASHLOK	JMV LPS
80	Photoluminescent Signages	3M	SAFEX	PROLITE AUTOGLO			
81	Automatic Transfer Switch (ATS)	VERTIV	APC	RIELLO	PILLER	EPI	SOCOMEC
		GE	L&T				
82	Static Transfer Switch (STS)	VERTIV	APC	RIELLO	PILLER	EPI	SOCOMEC
		GE					

3. Air-conditioning works

Brief Summary : Providing air-conditioning works for establishing ICR-ER at NDCC and North Block of MHA including design, supply installation, testing and commissioning of the Air conditioning system to meet the inside design conditions for various areas like Data Centre(Server room), Control rooms, Conference halls and office areas etc.. as per the details indicated in the drawings and in the document.

The vendor shall provide detailed design data and proposed air-conditioning equipment and accessories details with list of deliverables etc. area wise in the technical bid (part I). The vendor shall consider the detailed requirements of various AC areas and their operational requirements and arrive at the air-conditioning system accordingly. The air-conditioning system for UPS room, Data centre (server room) shall be independent for those areas only which shall be provided with suitable precision AC systems of DX type. For other areas suitable VRF systems with indoor units shall be considered and all areas shall be provided with standby capacity to meet the operational requirement.

Sl.No	DESCRIPTION	Qty
3.1	Precision AC system 1 Set- consisting of multiple precision AC units each of minimum 16 TR capacity to make up for total operating capacity of 48 TR and also to have a stand by capacity of minimum N+1 configuration or more for the Data Centre(Server room) to maintain the inside operating conditions on 24x 7 basis round the year. The configuration of proposed system shall be proposed as per the available space as indicated in the drawings and as per site conditions. The vendor may suggest one or two alternatives if so desired. The scope of work include the equipment and all connected accessories, connected piping, insulation grills and electrical, controls etc complete as required as per the site conditions	
3.2	Precision AC system -1 set consisting of precision AC unit each of minimum 8TR for total operating capacity of 8 TR and equal capacity standby unit for the UPS and Battery room to maintain the inside operating conditions on 24x 7 basis round the year. The configuration of proposed system shall be proposed as per the available space as indicated in the drawings and as per site conditions. The scope of work include the equipment and all connected accessories, connected piping, insulation grills and electrical, controls etc. complete as required as per the site conditions. DX type Air-conditioning system for comfort air conditioning of control rooms, conference hall and other areas other than those specified above as per the	1 Set

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3.3.	details of requirement and indicative drawings given in the tender document. The system consisting of multiple number of VRF units for maintaining comfort air conditioning with individual room control and with provision for cooling and also heating during winters. Minimum 50 percent Standby capacity shall be provided as per the scope of work.

3.4 Drawings

1. The detailed architectural drawings are enclosed.
2. Indicative layout of the Precision AC units for proposed Data Centre (Server room) and UPS system room are also enclosed.
3. The vendor shall submit the proposed arrangement drawings incorporating the AC Equipment layout and details of systems proposed for various areas clearly with list of Deliverables in Part I (i.e. Technical Bid). The brands of the equipment shall be as per the preferred makes list as indicated in the tender document.
4. Brief particulars of conditioned area user equipment:
    - Total IT Load of 160 kW distributed in 20` IT Racks with Rack Density of 8 kW Racks
    - UPS Capacity : 200 kVA
    - N+N Configuration for UPS with 30 Min. Back up on each UPS
    - N+1 configuration for PAC for UPS Room & N+2 for Server Room

A. Data Centre (Server room)

SNo	Parameter	Fully Populated
1	No. of Server Racks	16
2	No. of Network Racks	4
3	Power density per Server rack – kW	8
4	Power density per Network rack – kW	8
5	IT Load – kW	160

B. UPS Room:

- UPS Capacity : 200 kVA
- Total Heat Dissipation from UPS : 9 kW
- Total Heat Dissipation from Batteries While Charging : 12 kW

C. Other Areas:

- The air conditioning of all other areas viz. Control rooms, conference halls and office areas shall be for comfort air-conditioning and shall have adequate capacity to maintain the conditions of 23+3 degrees during all seasons of the year (ie. cooling during summer and heating during winter seasons of Delhi).

- The systems proposed shall be of DX type preferably VRF systems and shall have individual controls room wise so as to operate the systems on need basis in each of the area separately or simultaneously depending upon the user requirement.
- The location/ layout of indoor and outdoor units shall be clearly indicated with connected piping / wiring drawings as per site conditions along with the technical design data shall be provided in the Technical bid(Part I of tender). List of deliverables with make and model etc.shall also be indicated.

3.5 Drawings

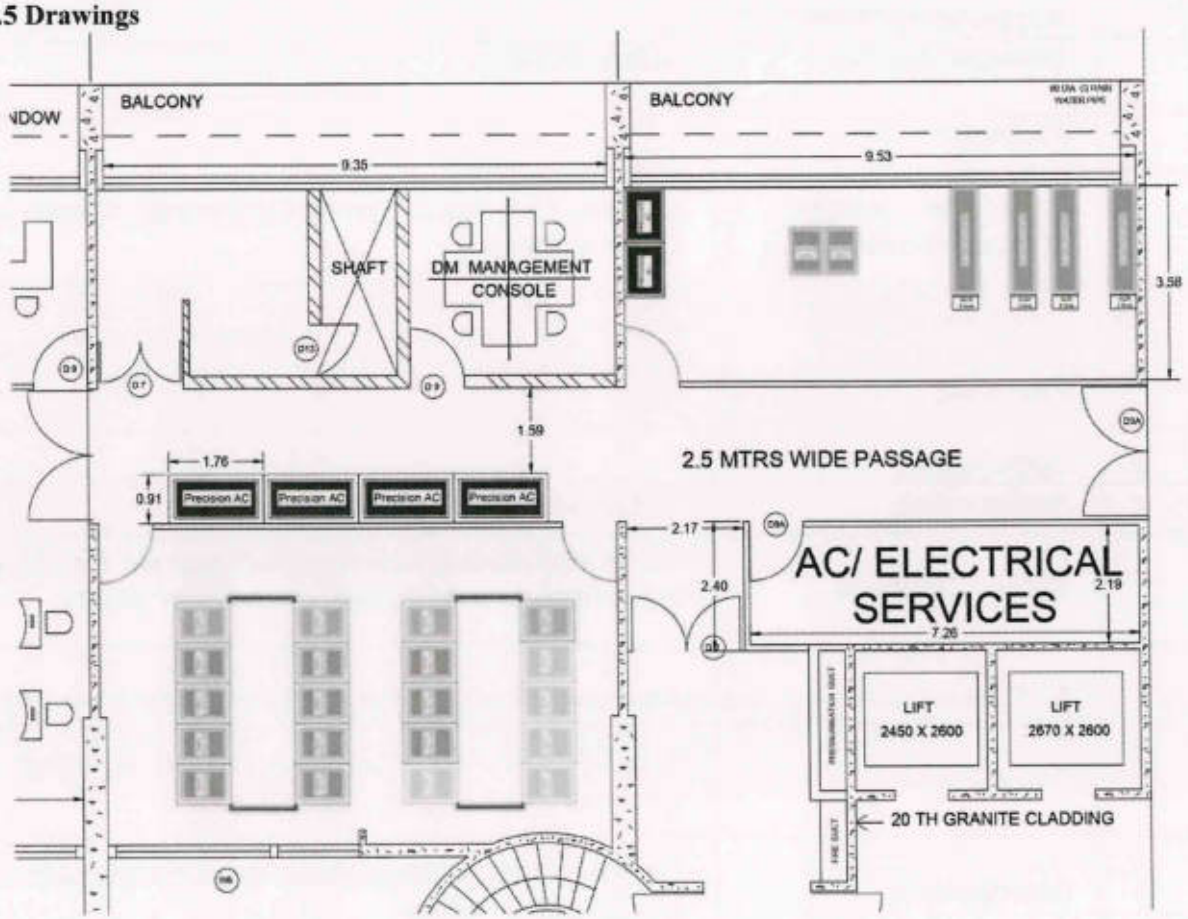

Figure 14 . Indicative AC Scheme for ICR ER @ NDCC towers

The agency shall possess experience in executing Air conditioning works of Precision air conditioners for data centre and VRF systems. In case the main contractor doesn't possess experience of air conditioning works, an under taking /MOU shall be done with the agency who possess experience of air conditioning works to carry out the work. Experience of the sub agency shall be submitted for verification and further processing.

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List of Approved Makes for Air conditioning

I. List of Approved Makes for High side Equipment

S.No	Equipment / Item	Approved Makes
1	Screw Chiller packages (Factory Packaged)	Trane/ Dunham Bush/ Carrier/ York/ Daikin McQuay/ Climaveneta/ Kirloskar / CIAT/ Voltas/ Bluestar/ Clivet/ Swegon Blue Box/ Hitachi
2	Reciprocating Chiller packages (Factory Packaged)	Voltas/ Bluestar
3	Scroll Chiller Packages (Factory Packaged)	Bluestar/ ETA/ Voltas/ Carrier/ Climaveneta/ Swegon Blue Box/ Daikin McQuay
4	Centrifugal Chiller packages (Factory Packaged)	Trane/ Dunham Bush/ Carrier/ York/ Daikin McQuay/ Climaveneta/ Kirloskar / Voltas/ Bluestar / Hitachi
5	Compressors	
a	Reciprocating	Voltas/ Accel/ Kirloskar/ Bock/ Bitzer
b	Screw Centrifugal	Trane/ Dunham Bush/ Carrier/ York/ Daikin McQuay/ Mitsubishi/ Melco/ Bitzer/ Hanbell/ Hartford/ Kirloskar/ Hitachi
c	SCFOII	Copeland / Emerson / Danfoss (Maneurop)/ Tecumseh
6	Pumps	Beacon Weir/ Kirloskar/ Crompton/ KSB/ Mather & Platt/ Grundfos/ Bell & Gossett/ Armstrong / Lubi
7	Cooling towers	Paharpur/ Mihir/ Advance/ Voltas/ Bell/ United Cooling Systems / Flow Tech Air Pvt Ltd
8	Open Expansion tank	3)OStO
9	Closed Expansion tank	Xylem / KD Agencies / Anergy
10	Air Compressors	Ingersoll rand / Chicago pneumatic / Elgi / Kobelco / Atlas Copco

List of Approved Makes for Low side Equipments & Clean room Accessories

S.No	Equipment / Item	Approved Makes
	Cooling Equipment:	
1	Double Skinned AHUs	Blue Start ABB/Carrier/Boopathy/ Citizen/ ETA/ Zeco/Voltas/Edge Tech/VTS/ Systemair/ Luftek/ Flaktwoods/ Crescendo India with Nicotra / Comefri / Kruger/ Greenheck/ Flaktwoods/ VTS Fans
2	Fan coil Units	Voltas/Blue Star/Carrier/Citizen/ETA/ VTS/ Zeco/ Edgetech/ Systemair/ Luftek/ Crescendo India
3	Precision airconditioning Package units	Vertiv / Stulz / Blue star / Schneider / Climaveneta / Swegon Blue Box/ Flaktwoods
4	Package Units	Voltas/ Blue Stan Carrier/ ETA/ Trane
5	Ductable Split AC Units	Voltas/ Blue Stan Carrier Midea/ ETA/ Daikin/ Trane/ Hitachi
6	Variable refrigerant Flow / Volume systems (VRF / VRV AC Units)	Voltas/ Blue star/ Carrier/ Carrier Midea/ O General/ Mitsubishi/ Dakin/ ETA Gree/ Toshiba/ Hitachi/ Trane
7	Split / Cassette / Floor standing AC Units	Voltas/ Blue Stan Carrier Midea/ Daikin/ Hitachi/ Panasonic/ Mitsubishi / Toshiba/ Trane / O General/ Lloyd
8	Window AC Units	Voltas/ Carrier Midea/ Blue Star/ Hitachi/ O-General
9	Walk-in-coolers	Blue star/ Carrier/ Rinac/ Eakcon/ Voltas
10	Air cooling equipment (Evoporative coolers)	Roots/Humidin/Breezair/Bry air
b.	Fans/ B/owers-	
11	Centrifugal blowers	Nicotra/ Comefri/ Kruger/ Duvent/ ACCO/ NADI/ Greenheck/ Flaktwoods/ Humidin
12	Axial flow fans Inline/Propeller	Systemair Kanalflakt/Nuaire/KrugerlDuvent/ ACCO/NADI/ Flaktwoods/ Humidin
13	fans	Systemair Kanalflakt/Nuaire/Alstom
14	Jet fans for Parking lots	Caryaire/Airovient/Systemair/Nuairegroup/ Humidin
15	Heat recovery wheel	Arctic India/ Bry air

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S.No	Equipment / Item	Approved Makes
1	Screw Chiller packages (Factory Packaged)	Trane/ Dunham Bush/ Carrier/ York/ Daikin McQuay/ Climaveneta/ Kirloskar / CIAT/ Voltas/ Bluestar/ Clivet/ Swegon Blue Box/ Hitachi
2	Reciprocating Chiller packages (Factory Packaged)	Voltas/ Bluestar
3	Scroll Chiller Packages (Factory Packaged)	Bluestar/ ETA/ Voltas/ Carrier/ Climaveneta/ Swegon Blue Box/ Daikin McQuay
4	Centrifugal Chiller packages (Factory Packaged)	Trane/ Dunham Bush/ Carrier/ York/ Daikin McQuay/ Climaveneta/ Kirloskar / Voltas/ Bluestar / Hitachi
5	Compressors	
a	Reciprocating	Voltas/ Accel/ Kirloskar/ Bock/ Bitzer
b	Screw Centrifugal	Trane/ Dunham Bush/ Carrier/ York/ Daikin McQuay/ Mitsubishi/ Melco/ Bitzer/ Hanbell/ Hartford/ Kirloskar/ Hitachi
c	SCFOII	Copeland / Emerson / Danfoss (Maneurop)/ Tecumseh
6	Pumps	Beacon Weir/ Kirloskar/ Crompton/ KSB/ Mather & Platt/ Grundfos/ Bell & Gossett/ Armstrong / Lubi
7	Cooling towers	Paharpur/ Mihir/ Advance/ Voltas/ Bell/ United Cooling Systems / Flow Tech Air Pvt Ltd
8	Open Expansion tank	3)OStO
9	Closed Expansion tank	Xylem / KD Agencies / Anergy
10	Air Compressors	Ingersoll rand / Chicago pneumatic / Elgi / Kobelco / Atlas Copco

4. Computer Systems Infrastructure- Servers, Storage & Network

Sl No	Generic name of the item with detailed specifications	Quantity
4.1	**Rack Servers**	**34 Nos**
	Specifications of each Rack server: 1. Rack server, maximum 2U form factor along with rack mount rail kit 2. Populated with 2 x Intel Xeon Scalable 24-core processors, base frequency of 2 GHz or higher/ better 3. 512 GB DDR4 RAM with 32 GB or higher DIMMs 4. Internal hot pluggable SAS Hard disk drives: 4 Nos X 1.8TB SAS 12G Enterprise 10K RPM SFF or Higher and 2 Nos of 3.2 TB Mixed Use SSD Drives 5. SAS RAID Controller with RAID 0, 1, 4/5/6. 6. 4 or more PCIe 3.0 slots with at least 2 PCIe 3.0 x16 slots 7. 2 x Gigabit Ethernet Ports 8. 4 x 10G Ethernet ports 9. Dual port 16Gbps Fibre Channel HBA adapter 10. Two or more USB Ports, 1 VGA / HDMI/ Display Port and 1 Management port 11. All power supplies and cooling fans should be fully populated for redundancy 12. Built-in support for virtualization 13. Operating System Support: It should support RHEL, CentOS, Windows Server 2016 & 2019 including Standard, Data Centre editions, VMware, Citrix Xen Server, Hyper-V, etc 14. Input Power 230V/ 50Hz with power cord suitable to Indian system 15. Server should have comprehensive system management features, diagnostic LEDs, sub component level diagnostics, failure notification, remote management, management software for all h/w & s/w etc. 16. Three years comprehensive onsite warranty, with hard disk media retention 17. All required interconnection cables between servers, storage, SAN/ network switches for all the configured 1G, 10G and FC interfaces to be supplied	
4.2	**Fault Tolerant (FT) Servers**	**02 Nos**

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	Each FT Server specifications: 1. Dual socket fault tolerant server with fully redundant modular hardware design 2. Rack server with rack mount/ rail kit. 3. 2 x Intel Xeon-Gold 6000 Series Scalable 16-core processors with base frequency of 2 GHz or higher/ better 256GB DDR4 RAM 4. Total usable 2 TB of SAS hard disk storage 5. Dual port 8/ 16 Gbps Fibre Channel HBA for SAN connectivity 6. 2 x 10G Ethernet ports. 7. 2 x 1Gigabit Ethernet ports. 8. Keyboard & mouse 9. All the power supplies and cooling fans to be fully populated and hot swappable. 10. Built-in support for virtualization 11. The server should have one dedicated management port. 12. Input Power 230V/ 50Hz with power cords suitable to Indian system 13. Three years comprehensive onsite warranty, with hard disk media retention 14. Server should have comprehensive system management features, diagnostic LEDs, sub component level diagnostics, failure notification, remote management, management software for all h/w & s/w etc.	
4.3	**80 TB Hybrid Unified Storage System** **[2 Nos. at ICR-ER Data Centre, New Delhi and 1 No. at, NRSC, Shadnagar]**	**03 Nos**
	Specifications of each 80 TB Unified Storage System: 1. The network storage system must be a dedicated & optimized unified NAS-cum-SAN appliance 2. All subsystems of the storage like heads, controllers, storage arrays, OS, NAS & SAN software's must be fully inter-compatible and provided & supported by the same principals/ OEM 3. The system must be a dedicated appliance (integrated/ gateway based) with specifically optimized OS for NAS & SAN. It must be storage OEM supported. It should not be Windows based or a general-purpose Unix/ Linux or a simple SMB/ NFS configured file server. The Storage system should be suitably configured for achieving enhanced performance and throughput 4. It must have minimum dual redundant storage and file controllers in active-active mode with automatic failover to each other in case of failure. The same controller pairs should provide all the required functionality of NAS and SAN	

	5. High available internal configuration with No Single Point of Failure (NSPoF) architecture and redundancy features at all levels, controllers, hot swap power supplies, PDUs, cache, links between subsystems etc. 6. Must support SSD, SAS & SATA/ NL-SAS disks and enclosures within same storage system 7. Must provide hardware RAID levels 0, 1, 10, 4/ 5 / 6. Must support different RAID groups within one storage system 8. The base unit, expansion disk enclosures and disks must be interconnected with multiple SAS-2 backend links with failover. All disks must be enterprise-class and dual-ported disks built for 24x7 operations 9. The base unit and disk expansion units must be seamlessly connected in hardware based RAID configurations, not as JBODs. RAID groups and LUNs must be able to span across the enclosures. 10. The storage must support configuring volumes/ LUNs across all the disks on all backend lanes 11. The Storage system must support at least 250 dual-ported disk drives without any replacement or upgrade of controllers 12. Must be configured with cache of 64GB or higher across controllers 13. Must be configured with a total of 80TB usable storage capacity in which 20TB of SSD storage and 60TB of SAS storage using 1.2TB/ 1.8TB disk drives. The storage capacities are after excluding overheads due to formatting, RAID configurations, hot spares etc. 14. The storage system must provide multi-tenancy feature 15. Provision to define/ configure the required RAID levels, RAID groups, data & parity disks and global hot spare disks allocation 16. Must be configured with NFS, CIFS, FC and iSCSI protocols and licenses 17. Must have auto-negotiating 16/8Gbps FC, 1 GbE and 10 GbE interfaces 18. Must be configured with following minimum front-end populated interfaces on the storage system: 6 x 10GbE (Optical 10G Base SR), 4 x 10GbE copper RJ45, 4 x 16 Gbps FC, 2 x 10G iSCSI ports 19. Must have NDMP or equivalent functionality with license 20. Must support heterogeneous client operating systems (on both block and file) which include all popular flavors of Windows, Linux and virtualization hypervisors (VMware, Xen, Hyper-V, etc.) 21. Must provide multiple levels of access control including role-	

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based security and auditing.

22. Must have Active Directory and LDAP integration
23. Must provide user/ group/ directory based file system quotas with access controls
24. Must have minimum 1024 LUNs support with required licenses
25. Configurable snapshots for block level and file level data with both create & restore functionality.
26. The storage system must have site replication feature for file and block level replication and should be provided along with required licences
27. The storage system & software must provide auto-tiering along with licenses for dynamic and automatic placement/ movement of data across the right disk storage tiers based on defined policies without any external third party software
28. Must have thin provisioning
29. The file systems should have capability to grow online.
30. Ethernet trunking and link aggregation.
31. Must have separate LAN ports/ equivalent for management
32. Comprehensive storage resources management software (Web GUI, CLI) for configuring, managing & administering block & file storage and associated functionalities including deployment, automation, provisioning, protection and continuous system monitoring, auditing, advanced remote diagnostics
33. Sufficient disk expansion units/ enclosures as required for the number of supplied disks to be supplied.
34. All required interconnection cables, fiber patch cables for all the configured 1G, 10G & FC ports/ interfaces to be supplied
35. All required licenses must be provided for enabling the storage system as required.
36. The supplied equipment must work with 200-240V,50 Hz AC power supply with Indian type power outlets. Necessary adapters to be provided by the vendor if required.
37. The storage system must be supplied with its separate storage OEM rack with dual PDUs, caster wheels, lock, and adequate room for housing the capacity. Of the 3 nos. of storage systems, one system is to be supplied with separate OEM rack at NRSC Shadnagar, Telangana . The other 2 nos. are to be housed in one OEM rack and positioned at the ICR-ER data centre at NDCC-II Building in New Delhi.
38. Three years comprehensive on-site warranty. The warranty shall also include disks, batteries, etc. and supply &installation of updates and upgrades of the software including BIOS, firmware, OS, patches and storage resource management software etc

	39. During warranty period failed hard disks must be replaced with new ones at no extra charges and the faulty disks will not be returned to the vendor.	
4.4	**100 TB All-Flash Unified Storage System [2 Nos. at ICR-ER Data Centre, New Delhi**	**02 Nos**
	Specifications of 100 TB All-Flash Unified Storage System 1. The storage system must be a dedicated & optimized unified NAS-cum-SAN based All -Flash appliance 2. All subsystems of the storage like heads, controllers, storage arrays, OS, NAS & SAN softwares must be fully inter-compatible and provided & supported by the same principals/ OEM 3. The system must be a dedicated appliance (integrated/ gateway based) with specifically optimized OS for NAS & SAN. It must be storage OEM supported. It should not be Windows based or a general-purpose Unix/Linux or a simple SMB/ NFS configured file server. The Storage system should be suitably configured for achieving enhanced performance and throughput 4. It must have minimum dual redundant storage and file controllers in active-active mode with automatic fail over to each other in case of failure. The same controller pairs should provide all the required functionality of NAS and SAN 5. High available internal configuration with No Single Point of Failure (NSPoF) architecture and redundancy features at all levels, controllers, hot swap power supplies, PDUs, cache, links between subsystems etc. 6. Must provide hardware RAID levels 0, 1, 10, 4/ 5 /6 .Must support different RAID groups within the storage system 7. The base unit, expansion disk enclosures and disks must be interconnected with multiple SAS-2 backend links with failover. All disks must be enterprise-class and dual-ported disks built for 24x7 operations 8. The base unit and disk expansion units must be seamlessly connected in hardware based RAID configurations, not as JBODs. RAID groups and LUNs must be able to span across the enclosures. 9. The storage must support configuring volumes/ LUNs across all the disks on all backend lanes 10. The Storage system must support at least 320 dual-ported disk drives without any replacement or upgrade of controllers 11. Must be configured with minimum cache of 128GB or higher across controllers 12. The SSD drives must not be used for any caching	

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requirements of the storage. The caching requirements of storage must be factored separately

13. Must be configured with a total of 100TB usable SSD storage capacity storage. The storage capacities are after excluding overheads due to formatting, RAID configurations, hot spares etc.
14. Provision to define/ configure the required RAID levels, RAID groups, data & parity disks and global hot spare disks allocation
15. The storage must have an additional 1 hot spare per 20 drives.
16. Must be configured with NFS, CIFS, FC and iSCSI protocols and licenses
17. Must have auto-negotiating 16/ 8Gbps FC, 1 GbE and10 GbE interfaces
18. Must be configured with following minimum front-end populated interfaces on the storage system: 6 x 10GbE (Optical 10G Base SR), 4 x 10GbE copper RJ45, 4 x 16 Gbps FC, 2 x 10G iSCSI ports.
19. Must have NDMP or equivalent functionality with license
20. Must support heterogeneous client operating systems (on both block and file) which include all popular flavors of Windows, Linux and virtualization hypervisors (VMWare, Xen, Hyper-V, etc.)
21. Must provide multiple levels of access control including role-based security and auditing.
22. Must have Active Directory and LDAP integration
23. Must provide user/ group/ directory based file system quotas with access controls
24. Must have minimum 1024 LUNs support with required licenses
25. Configurable snapshots for block level and file level data with both create & restore functionality.
26. The storage system & software must provide auto-tiering along with licenses for dynamic and automatic placement/ movement of data across the right disk storage tiers based on defined policies without any external third party software
27. Must have thin provisioning
28. The file systems should have capability to grow online.
29. Ethernet trunking and link aggregation.
30. Must have separate LAN ports/ equivalent for management
31. Comprehensive storage resources management software (Web GUI, CLI) for configuring, managing & administering block & file storage and associated functionalities including deployment, automation, provisioning, protection and

	continuous system monitoring, auditing, advanced remote diagnostics 32. The storage system must be supplied with its separate storage OEM rack with dual PDUs, caster wheels, lock, and adequate room for housing the capacity. The two nos of 100 TB flash storages are to be mounted in to one OEM rack at Delhi Data centre. 33. The storage system must have site replication feature for file and block level replication and should be provided along with required licences. 34. Sufficient disk expansion units/ enclosure as required for the number of supplied disks to be supplied. 35. All required interconnection cables, fiber patch cables for all the configured 1G, 10G & FC ports/ interfaces to be supplied 36. All required licenses must be provided for enabling the storage system as required. 37. The supplied equipment must work with 200-240V,50 Hz AC power supply with Indian type power outlets. Necessary adapters to be provided by the vendor if required. 38. Three years comprehensive on-site warranty for both the supplied hardware and software. The warranty shall also include disks, batteries, etc. and supply &installation of updates and upgrades of the software including BIOS, firmware, OS, patches and storage resource management software etc 39. During warranty period failed hard disks must be replaced with new ones at no extra charges and the faulty disks will not be returned to the vendor.	
4.5	**600 TB Unified Storage System** **[1 No. at ICR-ER Data Centre at NDCC-II Building, New Delhi and 1 No. at NRSC, Shadnagar]**	**02 Nos**
	Specifications of each 600 TB Unified Storage System: 1. The network storage system must be a dedicated & optimized unified NAS-cum-SAN appliance 2. All subsystems of the storage like heads, controllers, storage arrays, OS, NAS & SAN software's must be fully inter-compatible and provided &supported by the same principals/ OEM 3. The system must be a dedicated appliance (integrated/gateway based) with specifically optimized OS for NAS & SAN. It must be storage OEM supported. It should not be Windows based or a general-purpose Unix/Linux or a simple SMB/NFS configured file server. The Storage system should be suitably configured for achieving enhanced performance and throughput 4. It must have minimum dual storage and file redundant controllers	

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in active-active mode with automatic fail over to each other in case of failure. The same controller pair should provide all the required functionality of NAS and SAN

5. High available internal configuration with No Single Point of Failure(NSPoF) architecture and redundancy features at all levels. controllers, hot swap power supplies, PDUs, cache, links between subsystems etc.
6. Must support SSD, SAS & SATA/ NL-SAS disks and enclosures within same storage system
7. Must provide hardware RAID levels 0, 1,10, 4/ 5/ 6 . Must support different RAID groups within one storage system
8. The base unit, expansion disk enclosures and disks must be interconnected with multiple SAS-2 backend links with failover. All disks must be enterprise-class and dual-ported disks built for 24x7 operations
9. The base unit and disk expansion units must be seamlessly connected in hardware based RAID configurations, not as JBODs. RAID groups and LUNs must be able to span across the enclosures.
10. The storage must support configuring volumes/ LUNs across all the disks on all backend lanes
11. The Storage system must support at least 500 dual-ported disk drives without any replacement or upgrade of controllers
12. Must be configured with minimum memory/cache of 128GB or higher across controllers
13. Must be configured with a total of 600TB usable storage capacity in which 200 TB of SSD storage and 400 TB of NL-SAS disk drives. The storage capacities are after excluding overheads due to formatting, RAID configurations, hot spares etc.
14. Provision to define/ configure the required RAID levels, RAID groups, data & parity disks and global hot spare disks allocation
15. Must be configured with NFS, CIFS, FC and iSCSI protocols and licenses
16. Must have auto-negotiating 16/8 Gbps FC, 1 GbE and10 GbE interfaces
17. Must be configured with following minimum front-end populated interfaces on the storage system: 6 x 10GbE (Optical 10G Base SR), 4 x 10GbE copper RJ45, 4 x 16 Gbps FC, 2 x 10G iSCSI
18. Must have NDMP or equivalent functionality with license
19. Must support heterogeneous client operating systems (on both block and file) which include all popular flavors of Windows, Linux and virtualization hypervisors (VMware, Xen, Hyper-V, etc.)
20. Must provide multiple levels of access control including role-based security and auditing.

	21. Must have Active Directory and LDAP integration 22. Must provide user/group/directory based file system quotas with access controls 23. Must have minimum 1024 LUNs support with required licenses 24. Configurable snapshots for block level and file level data with both create & restore functionality. 25. The storage system must have site replication feature and should be provided along with required licences. 26. The storage system & software must provide auto-tiering along with licenses for dynamic and automatic placement/ movement of data across the right disk storage tiers based on defined policies without any external third party software 27. Must have thin provisioning 28. The file systems should have capability to grow online. 29. Ethernet trunking and link aggregation. 30. Must have separate LAN ports/ equivalent for management 31. Comprehensive storage management software (Web GUI, CLI) for configuring, managing & administering block & file storage and associated functionalities including deployment, automation, provisioning, protection and continuous system monitoring, auditing, advanced remote diagnostics 32. The storage system must be supplied with its separate storage OEM rack with dual PDUs, caster wheels, lock, adequate room for housing the capacity. 33. Sufficient disk expansion units/enclosure as requires for the number of supplied disks to be supplied. 34. required interconnection cables, fiber patch cables, for all the configured 1G/10G / FC ports/ interfaces to be supplied 35. All required licenses must be provided for enabling the storage system as required. 36. The supplied equipment must work with 200-240V,50 Hz AC power supply with Indian type power outlets. Necessary adapters to be provided by the vendor if required. 37. Remote Diagnostics: The proposed system should support Web based, Email facility for remote services to report errors and warnings. 38. Comprehensive on-site warranty for both the supplied hardware and software for a period of three years. The warranty shall also include disks, batteries, etc. and supply &installation of updates and upgrades of the software including BIOS, firmware, OS, patches and storage resource management software etc 39. During warranty period failed hard disks must be replaced with new ones at no extra charges and the faulty disks will not be returned to the vendor.	

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4.6	**Hyper Converged Infrastructure (HCI)** **[1 No. at NDCC-II, New Delhi and 1 No. at NRSC, Shadnagar]**	**02 Nos**

Specifications for the Hyper Converged Infrastructure (HCI):

1. The Hyper Converged Infrastructure (HCI) system must be provided as an integrated appliance solution pre-installed with server nodes, virtualization hypervisor, network, Software Defined Storage (SDS), data protection, high availability and comprehensive management
2. The HCI solution should deliver enterprise class storage services using latest x86 servers without dependence on a separate Storage Area Network or SAN switches or HBAs
3. The quoted HCI solution and the components including HCI software and hypervisor must be listed as a leader in recent Gartner's Magic Quadrant for Hyper Converged Infrastructure
4. The HCI solution must support scaling of storage capacity and performance linearly by addition of nodes

Nodes and cluster

5. The HCI must have an initial configuration of 8 nodes (6 regular nodes and 2 GPU nodes)
6. Each node must have the following or better configuration:
7. Rack server with rack mount kit
8. 2 x Intel Xeon scalable 24-core processor with base frequency of 2.0 GHz or higher
9. 512GB DDR4 2666MHz RAM
10. 4 x 10G or 2 x 40G Ethernet ports, 1 x 1G management port, 1 out-of-band management port
11. Redundant hot swap power supplies and cooling fans of suitable capacity
12. Required separate boot device
13. All nodes must be enterprise class x86 servers from one of these OEMs: HP/ Dell/ Lenovo/ Cisco
14. The solution must tolerate at least one node failure
15. The HCI must be scalable to 16 nodes or higher in a single cluster
16. Must have online cluster grow & shrink capability
17. The two GPU nodes must each be populated with 1 x Nvidia Tesla V100 (32GB) PCI-e GPU card along with 4-user Nvidia GRID vGPU software licenses
18. The GPU nodes must be supplied with full capacity redundant power supplies and cooling fans as appropriate for the GPU configuration
19. The GPU server nodes and the entire HCI solution including hypervisor, SDS and management software must be fully

	compatible and certified for the Nvidia GPUs and softwares **Storage** 20. The HCI storage solution must be scale out Software Defined Storage (SDS) distributed across the nodes. It must pool disk drives from all nodes to present single storage resource pool to all server nodes 21. The HCI solution must support various data replication factors (RF=2 and RF=3) or equivalent for data protection 22. Must have thin provisioning of storage 23. Must provide inline de-duplication, compression for entire storage 24. 40TB usable Enterprise SSD storage capacity or higher must be provided across all nodes. The usable capacity must be net usable storage space excluding cache capacity and after RF=2 implementation. The capacity shall be achieved without considering any data protection overheads or space efficiency features (RAID, erasure coding, de-duplication, compression, etc.). The storage must sustain at least one node failure. 25. Required Boot device also must be separately provided **Virtualization, Hypervisor** 26. Enterprise server virtualization features must be built into the HCI solution 27. Must be compatible with all standard guest OSs (in particular: Windows Server 2012, Windows Server 2016, Windows 10, Windows 8, RHEL, CentOS, Ubuntu) 28. Virtualization software must have the capability to create virtual machine templates to provision new servers 29. Must provide zero downtime, zero data loss and continuous availability for the applications running in virtual machines in the event of physical host failure 30. Must enable configuration of virtual machines for 1 node or 2 nodes failure 31. Must have virtual machine High Availability 32. Must provide intelligent virtual machine placement and initial VM placement in a cluster and distribution of VMs across nodes in a cluster. 33. Must provide live migration of running virtual machines from one node to another with zero downtime and continuous service availability 34. In the event of node failure, virtual machines should automatically move and run on other designated node(s) 35. Hypervisor should provide the ability to hot add CPU, memory, disks and NICs	

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36. Must have virtual machine automated resource scheduling and auto load balancing of resources across nodes and VMs
37. Must provide virtual machine affinity rules
38. Must provide for creation and restore of snapshots for individual virtual machines.
39. Must allow taking clones of individual virtual machines and have an integrated wizard for batch clones of virtual machines and customization
40. Must support Layer 2 virtual switches with VLAN support
41. The hypervisor software must be fully compatible and certified for the Nvidia GPUs and software
42. Must provide sharing of GPU among different virtual machines using vGPU
43. Must provide for allocation/ scheduling of physical GPU to virtual machines

Network

44. Must include 2 nos. of high-performance low-latency network switches with Layer 3 feature set, 32 or more ports per switch, redundant power supplies and cooling fans. The switches must be provided with sufficient 10G/ 40G populated ports and bandwidth for downlink ports and minimum 2 x 40G and 6 x 10G populated ports for uplink connectivity. All required SFPs, transceivers and licenses to be provided. The switches must be fully compatible and tightly integrated into the HCI solution for maximum performance
45. If only Layer 2 switches are natively provided within the HCI appliance, 2 nos. of high-performance low-latency Layer 3 switches must be additionally provided and integrated with the solution. Each of these two Layer 3 switches must be configured with at least 16 ports, of which 2 ports must be populated with 40G and 8 ports with 10G SFPs and transceivers. The switches must be fully compatible and tightly integrated into the HCI solution for maximum performance
46. All required cables and connectors for connecting all HCI nodes to switches in redundant mode to be supplied

Rack

47. Server OEM certified 42U/ 45U rack with dual PDUs and all standard features must be supplied

Management

48. Must provide client authentication using protocols and directory services such as LDAP and Active Directory
49. Must provide Role Based Access Control to enable fine grained access control and management of resources
50. Must have comprehensive tools to manage clusters and

	monitor health from the same console 51. Multi cluster virtual machines and storage management from a single console 52. Must have in-built support for Rest APIs to provision, manage, access and utilize the resources 53. Must provide a HTML5 User Interface, SNMP v3 monitoring, SMTP alerts, analysis of alerts 54. Must provide dashboard to manage and provision virtual machines, network & storage, monitor performance and manage events, logs & alerts 55. HCI solution should provide enhanced visibility into storage throughput and latency of hosts and virtual machines that can help in troubleshooting storage performance issues 56. Must allow updates of hypervisor and SDS without any virtual machine downtime 57. The HCI must provide seamless non-disruptive upgrade for system firmware, hypervisor, SDS software, management software and other software 58. All hypervisor, SDS, management, vGPU and other software licenses supplied should be perpetual 59. Comprehensive on-site warranty for both the supplied hardware and software for a period of three years. The warranty shall also include disks, batteries, etc. and supply &installation of updates and upgrades of the software including BIOS, firmware, OS, patches and storage resource management software etc 60. During warranty period failed hard disks must be replaced with new ones at no extra charges and the faulty disks will not be returned to the vendor.	
4.7	**Archival Object Storage System [1 No. at ICR-ER Data Centre, NDCC-II, New Delhi and 1 No. at NRSC, Shadnagar]**	**02 Nos**
	Specifications of Archival Object Storage System 1 PB: 1. The Archival Object Storage System must be hardware appliance based dedicated, native Object Storage system 2. All subsystems/ components of the Object Storage system like nodes, gateways, controllers, storage arrays, OS and softwares must be sourced & supported by the single Principal/ OEM having support centre in India 3. Must be high-available No Single Point of Failure (NSPoF) configuration with redundancy / fail-over for all subsystems 4. The system must be based on distributed and scale out architecture, with scalable augmentation of both the nodes as well as storage, and across geographical locations	

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5. The proposed Object Storage product must be listed in the Top 10 of latest Gartner 'Critical Capabilities for Object Storage' report
6. In addition to the native object storage architecture, the storage system must also provide data access natively or via gateways to users as a NAS system with CIFS, NfSv3 protocols. In case of gateway models, the gateways must be optimized high-performance and high-available subsystems from same OEM
7. The storage system must provide global namespace with true anywhere access.
8. It should be able to efficiently store PBs of data, billions of small files and/ or large files.
9. The storage system must implement distributed erasure coding. It must be configured using erasure coding to withstand 2 or more simultaneous drive failures out of 10 disks or better
10. Must provide self-healing in case of parity mismatch. No manual intervention should be required in case of the drive failures
11. Minimum 4 nodes should be provided and configured for user data access with minimum 8 nos. or more of populated 10Gbps LAN ports across the nodes
12. Must be configured with 1PB of net usable storage using 6TB or higher capacity disks with erasure coding as specified above. Licenses for all the features mentioned in this tender for all nodes and entire 1PB capacity should be included
13. The storage must provide balancing of the stored capacity across all nodes in the cluster to ensure even and efficient load distribution.
14. The storage system should provide rebalancing of data across all the nodes and racks when new nodes and racks are added
15. It must allow addition of nodes (for I/O) and disk systems (for capacity) independent of each and without downtime
16. Must be supplied with suitable 42/ 45U rack from same storage OEM populated with redundant PDUs. All the nodes must be installed in the OEM rack.
17. The storage must provide integration with Active Directory and LDAP
18. It should support Windows and Linux, OS without requirement to install client software
19. The storage must enable data to be stored with standard and custom metadata. It must allow creation of custom metadata fields for objects and ingest data by manual means, through

	application and programmatically 20. It should have native search feature to retrieve objects with metadata. 21. The storage should have industry standard APIs like REST, SNIA-CDMI, Amazon S3 ,Open Stack Swift, etc. for ingest/ retrieval of objects and data/ storage system administration & management. 22. It must have open architecture with inbuilt support for HTTP, HTTPS, CIFS, NFS protocols and should not require any third party software/ hardware to provide this or to perform ingest & retrieval 23. The storage system must allow access to stored data for data analytics via HDFS 24. The system must be capable of and licensed for multi-tenancy and to provision, meter the capacity, bandwidth and usage across multiple tenants. 25. The object storage should return the unique identity information for the stored object, along with version ID, storage location, date & time stamp etc. 26. It should maintain the authenticity and integrity of the objects and protect against corruption or tampering using digital cryptographic hash keys such as MD5/ SHA-1 / SHA-2 27. The storage must support tiering of files off to an external storage (outside Object Storage) based on the policies - to external disk-based storage or cloud-based storage via CIFS / NFS or S3-compliant protocols 28. When the files are tiered off to an external storage, file metadata should continue to reside on the object storage such that files can seamlessly be accessed and searched by the application 29. It should provide content protection by allowing more than one copy of the data using Object level mirroring or parity 30. The system must provide versioning for files that will be edited, for potential use in recoveries. System should allow to set policies to enable or disable versioning at tenant level 31. It should support "deletion/ reclaim" of the objects which get deleted through application or by virtue of retention expiration 32. It should have metadata-driven policies to automate placement, protection, availability at object, tenant, or system levels and set retention and expiration 33. It should be able to scale seamlessly across geographically dispersed data centres. It must have site replication feature and should be provided along with required licences. 34. It must provide comprehensive monitoring, alerting and	

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	reporting capabilities that can be customized to provide tenants and other users with unique tailored views of their multi-data-type storage environments 35. Comprehensive storage management software (Web GUI and CLI) for fully configuring, managing and administering the object storage, NAS and associated functionalities, including deployment, automation, provisioning, protection and monitoring 36. It should maintain transactional logs and should have functionality to audit these logs. System must support controlled privilege and audited delete, shredding 37. All the required cables/ interfaces/ modules/ SFPs other equipments necessary for making the system operational must be provided 38. Comprehensive on-site warranty for both the supplied hardware and software for a period of three years. The warranty shall also include disks, batteries, etc. and supply &installation of updates and upgrades of the software including BIOS, firmware, OS, patches and storage resource management software etc 39. During warranty period failed hard disks must be replaced with new ones at no extra charges and the faulty disks will not be returned to the vendor.	
4.8	**LTO Tape Library**	**01 Nos**
	Specifications of Tape Library: 1. Tape library: LTO Tape library should be supplied with 8 Nos. of LTO7 drives 2. LTO Tape library should be supplied with 150 slots and should be scalable up to 300 slots or more slots. 3. Drives Interface: 8/16 Gbps or better FC drive interface to SAN Switch. 4. Tape library shall provide web based remote management 5. Offered library shall be provided with hardware device like USB key, separate alliance etc. To keep all the encrypted keys in a redundant fashion. 6. Shall be rack mountable. 7. Shall have option for redundant power supply 8. Tape library shall be supplied with software which can predict and prevent failures through early warning and shall also suggest the required service action 9. Offered software shall also have the capability to determine when to retire the tape cartridges and what compression ratio is being achieved	

	10. Mixing of drives in Tape library should support mixing of LTO drive generations in same enclosure. 11. All required items like cables and HBAs should be supplied. The vendor should provide all necessary components, such as cables, adapters, to connect the tape library to the proposed storage/server/SAN switches. 12. Supply of LTO7 or higher compatible tape cartridges (with barcode labels) - 300 Nos and cleaning cartridges (with barcode labels) - 20 Nos along with the tape library 13. Comprehensive on-site warranty for both the supplied hardware and software for a period of three years. The warranty shall also include disks, batteries, etc. and supply & installation of updates and upgrades of the software including BIOS, firmware, OS, patches and storage resource management software etc	
4.9	**Backup software**	**01 Nos**
	Specifications of Backup Software: 1. The proposed backup solution should be available on various OS platforms such as Windows, Linux and UNIX platforms. The present requirement is for installation on one of the server systems running RHEL OS. 2. The proposed backup solution shall have same GUI across heterogeneous platform to ensure easy administration 3. The proposed backup solution should allow creating tape clone facility after the backup process. 4. The proposed backup solution should allow creating tape clone facility after the backup process. 5. The proposed 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 6. The proposed backup solution shall be configured with unlimited client and media licenses for both SAN based backup and LAN based backup 7. The proposed backup solution supports the capability to write up to 32 data streams. 8. The proposed backup solution supports de-multiplexing of data cartridge to another set of cartridge for selective set of data for faster restore operation to client/servers. 9. The proposed backup solution has inbuilt media management and supports cross platform device and media sharing in SAN environment. It provides a centralized scratched pool thus ensuring backups never fail for media. 10. The proposed backup solution has in-built frequency and calendar based scheduling system.	

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11. The proposed backup solution has certified "hot-online" backup solution for different type of enterprise databases and applications
12. The proposed backup solution shall also support granular recovery for VMware, Exchange server, Share point Portal
13. The proposed backup software should use the same API for software and hardware reduplication
14. The backup software should support backup to disk/VTL/Reduplication Device via Fibber channel
15. The proposed backup software should give the option to allow de duplication to be done either on the application server or on the Backup Server or at the target device
16. The proposed backup solution shall support synthetic full backup/Virtual full backups.
17. The proposed backup solution must support at least AES256-bit encryption capabilities.
18. The backup software should support different time zone within enterprise environment, where backups can be scheduled across different time zones from the same single schedule
19. The backup software should support priority based backup schedule, missed job execution and Advanced Scheduling option.
20. The backup software should be able to recover only critical volumes and later restore other volumes that were backed up in separate sessions.
21. The backup software should be capable to supporting more than 10K backup sessions in day and 1000 concurrent sessions
22. The backup software should support the open SSLFIPS and parallel backup of VMDK files
23. The backup software should support automated replication/ synchronization
24. The backup software should support de-duplication device like store once and data domain
25. The backup software should have licenses to backup data to 2 SAN based tape drives with more than 200 slots
26. Mixing of drives in Tape library should support mixing of LTO drive generations in same enclosure.
27. All required items like cables and HBAs should be supplied. The vendor should provide all necessary components, such as cables, adapters, to connect the tape library to the proposed storage/server/SAN switches.
28. Specification of backup/restore software:
29. The proposed backup solution should be available on various

	OS platforms such as Windows, Linux and UNIX platforms 30. The proposed backup solution shall have same GUI across heterogeneous platform to ensure easy administration 31. The proposed backup solution should allow creating tape clone facility after the backup process. 32. The proposed backup solution should allow creating tape clone facility after the backup process. 33. The proposed 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 34. The proposed backup solution shall be configured with unlimited client and media licenses for both SAN based backup and LAN based backup	
4.10	**Desktop PCs**	**44 Nos**
	Specifications of each Desktop PC: 1. Intel Core i7 with latest generation processor or better 2. 16GB DDR4 RAM 3. 2 nos of 1 TB SATA HDD 4. Gigabit Ethernet 5. PCI –e x16 graphics card with 1GB RAM 6. 6 USB 3.0 ports (2 in front); 1 VGA port, HDMI/ DP, 2xPS/2, audio-in, audio-out 7. 2 or more PCI-e slots 8. 2 or more internal disk bays and 2 or more external bays 9. USB Keyboard and USB Optical scroll mouse with cables 10. 24" QHD LED Monitor having 2560 x 1440 resolution, VGA, HDMI/ DP ports with cables Microsoft S Windows10 Pro 64-bit OS 11. 3 years onsite comprehensive warranty and support	
4.11	**Analysis Workstations**	**18 Nos**
	Specifications of each Workstation 1. Form Factor : Tower 2. 2 Nos. of Intel Xeon Scalable 10-core processor 2 GHz or better 3. 128 GB DDR4 RAM 4. Intel C622 chipset or better 5. NVIDIA Quadro P4000 (8 GB GDDR5 dedicated) Graphics Card or better 6. Should support both Windows, Linux and CentOS, etc 7. Hard Drive RAID Controller card with RAID 0,1 and 4/5/6 8. Internal HDD: 2 TB SSD (PCIe SSD or m2 SSD or better) and 2 TB SATA Enterprise drives for data 9. 2 Nos of Gigabit Ethernet ports 10. 4 or more USB 3.0 ports, 1 VGA port, HDMI/ DP, 2xPS/2,	

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	audio-in, audio-out 11. 6 or more PCIe slots with 2 nos of PCIe x8 and 2 nos of PCIe x16 12. USB optical scroll mouse, USB Keyboard with cables 13. 24" QHD LED Monitor having 2560 x 1440 resolution, VGA, HDMI/ DP ports with cables 14. Microsoft Windows 10 Pro 64-bit OS 15. Redundant power supplies and cooling fans hardware/unit 16. 3 years onsite comprehensive warranty and support	
4.12	**Laptops**	**04 Nos**
	Specifications of each Laptop 1. Intel Core-i7 processor with latest generation,2.0 GHz or better 2. Conformance to Intel Ultrabook specifications; ULV platform, ~0.8" thick, ~2Kg 3. 16GB DDR3 SDRAM or higher 4. Intel HD Graphics 4000 or better 5. 14" HD+ (1600 x 900) anti-glare LED backlit screen 6. 512GB or larger Solid State Drive (SSD) 7. Integrated backlit full size keyboard, track point, multi-touch touchpad 8. Gigabit Ethernet RJ45 interface, 802.11 a/g/n wireless LAN and Bluetooth 4.0 9. At least 2 x USB3.0 ports, VGA, HDMI port, built-in webcam, speakers, stereo headphone/ microphone combo 10. 4-cell or higher battery and AC adapter-cum-charger with cables 11. Aluminum/ magnesium alloy based chassis construction 12. Carry case, all necessary drivers, cables and connectors 13. Microsoft Windows 10 Prof 64-bit OS with license 14. 3 years onsite comprehensive warranty and support	
4.13	**Server Load Balancers**	**04 Nos**
	1. Appliance should have at least 2 Gbps throughput with scalability up to 4Gbps 2. Appliance should have at least 1 Gbps compression & 1Gbps SSL throughput 3. Should have 7500 SSL TPS with 1 million concurrent sessions 4. Should have 4 x 10/100/1000 Mbps Ethernet network interfaces 5. Should provide load-balancing and content-switching functions with granular traffic control based on layer 4 through layer 7 rules 6. Should maintain simultaneous multiple TCP/IP connection from same client in same session	

	7. Should support stateful failover capability 8. Should check regularly the health of application servers and server farms through configuration of health probes 9. Should protect the data center & applications from various protocol & attacks like Denial of service (DoS) and also encrypt the mission critical events 10. Should provide the deep packet inspection capability to secure the mission-critical applications and protect against identity theft, data theft and application disruption 11. Appliance should have the capability to act as a virtual load balancer for providing the services up to 20 separate departments 12. Appliance should have integrated device manager for configuring and managing the load balancer appliance 13. Appliance should improve the server efficiency through flexible application traffic management and offloading of CPU intensive task such as HTTP compression, SSL encryption & decryption processing and TCP session management etc 14. It should support these management options: secure web based management, SSH, TELNET, SNMP v1, 2, 3; GUI based, command line	
4.14	**System Softwares**	**1 set**
	1. Windows Server 2019 Data Centre Edition with license and 3-yr subscription support for 8- servers each 48 cores; 2. Windows Server 2019 Standard Edition with license and 3-yr subscription support for 14 servers each 48 cores 3. Windows Server 2019 RDS CALs– 200 Nos 4. Windows Server 2019 CALs - 200 nos 5. Red Hat Enterprise Linux for Virtual Datacenter with 3 Year Support –8 Servers(12 Sockets) 6. Red Hat Enterprise Linux Server with 3-yr std support - 12 No of Servers each with 2 Sockets 7. Enterprise Hypervisor suite (VSphere) - 40 sockets license 8. Virtual Desktop Infrastructure (VDI) licenses - 40 user licenses 9. VMware VCenter Server Standard Edition – 2 Nos	
4.15	**Routers**	**08 Nos**
	1. The Router should have a Performance of 1Gbps 2. The Router should support future Performance Upgrade to 2Gbps 3. The Router should support a high performance architecture 4. The Router should support multi-core Processor 5. The Router should support modular architecture 6. The Router should support a fabric which will allow high-bandwidth module-to-module communication without	

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	compromising routing performance
	7. The Router should support out of band management access.
	8. The Router should support a single software image containing all of the feature sets which can be activated with a software license
	9. The Router should have a maximum Form Factor of 2 RU
	10. The Router should support 3 onboard WAN or LAN 10/100/1000 ports
	11. The Router should support 2 GE/SFP ports
	12. The Router should support 2 POE GE/SFP based ports
	13. The Router should support hosting of 3rd Party& custom applications on a server module which can be easily integrated in to the router
	14. The Router should support TACACS+
	15. The Router should support RADIUS
	16. The Router should support Secure Shell SSH Terminal-line access
	17. The Router should support Multilink Point-to-Point Protocol (MLPPP)
	18. The Router should support Serial port.
	19. The Router should support IPv4/IPv6 Dual Stack
	20. The Router should support Static routes
	21. The Router should support Open Shortest Path First (OSPF)
	22. The Router should support Enhanced IGRP (EIGRP)
	23. The Router should support Border Gateway Protocol (BGP)
	24. The Router should support Intermediate System-to-Intermediate System (IS-IS)
	25. The Router should support Policy-Based Routing (PBR) for Traffic Management
	26. The Router should support Multicast Internet Group Management Protocol (IGMPv3)
	27. The Router should support IGMP Snooping
	28. The Router should support IGMP Version 3 - Explicit Tracking of Hosts, Groups, and Channels
	29. The Router should support Protocol Independent Multicast sparse mode (PIM SM).
	30. The Router should support Protocol Independent Multicast Source Specific Multicast (SSM)
	31. The Router should support Distance Vector Multicast Routing Protocol (DVMRP)
	32. The Router should support IP Multicast Load Splitting - Equal Cost Multipath (ECMP) using S, G and Next-hop
	33. The Router should support IPv4-to-IPv6 Multicast
	34. The Router should support HSRP (Hot Standby Router Protocol V2) or equivalent

	35. The Router should support Quality of Service (QoS) - Classification Only 36. The Router should support Shaping Granularity for QoS 37. The Router should support Single Rate 3-Color Marker for Traffic Policing 38. The Router should support Strict Priority Low Latency Queueing (LLQ) 39. The Router should support Weighted Fair Queueing (WFQ) 40. The Router should support Weighted RED (WRED) 41. The Router should support RTP Header Compression 42. The Router should support RTP and TCP Header Compression 43. The Router should support Network Address Translation (NAT) for IPv4 44. The Router should support Network Address Translation (NAT) for IPv6 45. The Router should support IPSec ESP - Phase II with NAT 46. The Router should support Host Number Preservation with NAT 47. The Router should support NetMeeting Directory (LDAP) ALG with NAT 48. The Router should support VRF Aware NAT 49. The Router should support NAT SCCP Video support 50. The Router should support of H.323v2 Call Signaling (Fast Connect) 51. The Router should support Rate Limiting NAT Translation 52. The Router should support Static IP with NAT 53. The Router should support of IP Phone to Cisco Call Manager with NAT 54. The Router should support for H.323v3 and v4 in v2 Compatibility mode with NAT 55. The Router should support AAA Resource Accounting 56. The Router should support AAA Authorization and Authentication Cache 57. The Router should support AAA Server Group 58. The Router should support IPv6 Neighbour Discovery 59. The Router should support IKEv2 Head end support for remote access clients – any connect, win7 ipv6, Flexvpn hardware client. Multi sa support for vti 60. The Router should support IKEv2 Remote Access Headend 61. The Router should support Dynamic Multipoint VPN (DMVPN) or equivalent 62. The Router should support Next Hop Resolution Protocol (NHRP) 63. The Router should support IPv6 over DMVPN 64. The Router should support EIGRP Dual DMVPN domain Enhancement	

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	65. The Router should support DMVPN Configuration using FQDN 66. The Router should support Tunnel Health Monitoring and Recovery (Interface Line Control) for DMVPN 67. The Router should support Tunnel Health Monitoring and Recovery (Backup NHS) for DMVPN 68. The Router should support Tunnel Health Monitoring and Recovery (Syslog) for DMVPN 69. The Router should support PfR EIGRP mGRE DMVPN Hub-and-Spoke support 70. The Router should support Group Encrypted Transport VPN (GETVPN) or Equivalent 71. The Router should support GETVPN Support for VRF-Lite 72. The Router should support Embedded Syslog Manager (ESM) 73. The Router should support Syslog over IPV6 74. The Router should support NAT - Syslog 75. The Router should support Reliable Delivery and Filtering for Syslog 76. The Router should support VRF Aware System Message Logging (Syslog) 77. The Router should support ACL syslog Correlation 78. The Router should support Logging to Local Nonvolatile Storage (ATA Disk) 79. The Router should support System Logging - EAL4 Certification Enhancements 80. The Router should support Configuration Change Notification and Logging 81. The Router should support NetFlow or Equivalent 82. The Router should support Flexible Netflow - MPLS Egress NetFlow 83. The Router should support Policy-Based Routing (PBR)	
4.16	**Link Load balancer** 1. The proposed solution should be purpose build ASIC based hardware appliance. 2. System should support 6 Gbps throughput and should be scalable to 24 Gbps throughput 3. The solution should have at least 16GB of memory (RAM) to support multiple load balancing functions and scalable up to 32GB RAM 4. System should support minimum 600K Layer 4 Connection Per second 5. System Should support minimum 800K Layer 7 Request Per second 6. System should support out bound load balancing 7. System should support Inbound Link Load balancing and ability to	**04**

	resolve DNSSEC 8. System should support at least 10 internet/intranet links to load balance 9. system should support multi path health monitoring to monitor the link status 10. Should Support Global server Load Balancing from Day 1 11. Should have DNS capability for inbound load balancing 12. Selection of shortest path to Destination based on load/Hops/response time 13. Solution should support Traffic shaping / Bandwidth Management from Day 1 14. Offered product should be IPv6 Ready 15. Shall provide individual health check for each link 16. Should have predefined health check on protocols like HTTP, SMTP, POP3, DNS, Ping, FTP, SNMP etc 17. Should support Role Based Access Control for Management 18. System supports performing load balancing for Layers 4 through 7 of the Open Systems Interface (OSI) reference model with support to the IP, TCP and UDP protocols 19. The OEM should be leaders in 2018 Gartner's Magic Quadrant for the product line.	
4.17	**Perimeter UTMs**	**02 Nos**
	1. The proposed device should be a dedicated appliance specifically designed for UTM functionalities. 2. The device should be offered with rack mount kit and should be rack mountable in any industry standard network rack. 3. The offered UTM devices should be configured in High Available mode and necessary licenses to be included in the offer. **Interfaces / Ports** 4. Should support 12 or more gigabit RJ45 interfaces with auto sensing 10/100/1000 capability 5. Should support minimum 4 x 10GE SFP+ slots and should be populated with SR transceivers 6. Should support 8 or more GbE SFP slots 7. Should support 1 or more Number of USB ports and minimum 1 Console port **Performance** 8. Must support at least 12,000,000 or more concurrent connections 9. Must support at least 300,000 or more new sessions per second processing. 10. Should have Firewall throughputs of minimum 80 Gbps or more 11. IPSec VPN throughput should be 50 Gbps or more 12. Real time NGFW throughput should be 7 Gbps or more 13. Threat Protection throughput should be 5 Gbps or more	

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Features & Capabilities

14. The offered device should operate on both NAT and Transparent Modes and also IPv6 ready.
15. Should provide NAT functionality, including PAT. Should support NAT 66, NAT 64, DNS 64, Static NAT IPv4 to IPv6 and vice versa IPv6 to IPv4 tunneling or dual stack.
16. Should provide advanced NAT capabilities, supporting NAT Traversal for services like SIP/H.323 /SCCP
17. Should support Voice based protocols like H.323, SIP, SCCP, MGCP, RTP Pinholing.
18. Should support User Group based Authentication
19. Should have provision to create secure zones / DMZ (ie Multi-Zone support)
20. Should Support Security Context or equivalent feature. Should be offered with minimum 10 licenses with the UTM.
21. Should support Packet Capture/sniffer to capture and examine the contents of individual data packets that traverse the firewall appliance for troubleshooting, diagnostics and general network activity
22. Should support more than one ISP/MPLS link with automatic ISP/MPLS link failover as well as ISP link load sharing for outbound traffic
23. Should support Device based license for Firewall.
24. OEM should be having minimum 95% Security effectiveness from latest NSS Lab's Next Generation Firewall testing report
25. The Firewall OEM should be ICSA Labs certified for Enterprise Firewall and should be Common Criteria EAL 4 certified
26. The Firewall OEM should be leaders in latest Gartner's Enterprise Firewall Magic Quadrant.
27. Should support the standards based Multi-Link aggregation technology (IEEE 802.3ad) to achieve higher bandwidth.
28. Should support VLAN tagging (IEEE 802.1q) in NAT/Route mode
29. Should support Static routing, Dynamic Routing (RIP, OSPF,BGP) Policy Based Routing
30. Should support DHCP Server, DHCP relay and DHCP client functionality
31. Should have authentication for Users/Admin's (Local and Remote – RADIUS, LDAP & TACACS+)
32. Support for RSA SecureID or other Token based Products
33. The VPN (IPSec& SSL) should be integrated with firewall
34. Should support standard encryption protocols such as DES & 3DES, MD5, SHA-1, SHA-256 authentication, Diffie Hellman, Internet Key Exchange v1, v2 algorithms, AES 128, 192 & 256
35. Should support IPSec Site-to-Site and IPSec Site-to-Client VPN

	tunnels. 36. Should support NAT within IPSec/SSL VPN tunnels 37. Should have a built-in Signature and Anomaly based IPS engine on the same unit 38. Should have protection for minimum 1000 IPS signatures 39. Should be able to prevent denial of service and distributed Denial of Service attacks. 40. Should support user-defined signatures (i.e., Custom Signatures) with Regular Expressions. 41. The IPS should also include Botnet filtering, detecting, preventing Botnet command and control traffic 42. Should have Application control feature for all commonly used applications 43. The appliance should facilitate embedded anti-virus support 44. The Gateway AV should be supported for real-time detection of viruses and malicious code for HTTP,HTTPS, FTP, SMTP, SMTPS, POP3 and IMAP, NTP and IM protocols 45. Should have configurable policy options. Possible to select traffic to scan for viruses. 46. Should have ability of IPS Checking, application control and Antivirus scanning for IPv6 traffic and for encrypted traffic like HTTPS 47. The appliance should facilitate embedded Web Content Filtering feature. 48. The URL database should have 200 million or more URLs falling under different categories 49. Should be able to block different categories/sites based on User Authentication. **Logging & Reporting** 50. Firewall should support logging to multiple syslog servers and should generate reports by integrating with other solutions. Reporting should not be done on firewall appliance and should be on a separate device. 51. The reporting tool needs to be bundled or quoted along with the solution. The logging and analysis should either be an appliance or on a dedicated PC/ Server platform. In case the OEM does not have an appliance for logging and reporting, the vendor should take the responsibility of supplying the hardware, OS and licenses with specified warranty. 52. The hardware/appliance should have a minimum capacity of 4 TB HDD storage configured in RAID to handle hard disk failures 53. The solution should provide comprehensive security event logging, reporting & correlation with digital forensics i.e. lawful interception & archiving of interesting popular protocol traffic such	

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	as SMTP, HTTP, POP3, IMAP, FTP, IM, NTP etc for regulatory compliances & analysis purpose 54. Logging appliance should have minimum two network ports for connectivity	
	Device Management 55. Firewall should be managed through centralized management solution. It can be either appliance or vm based. 56. The centralized management platform must be accessible via a web-based interface and ideally with no need for additional client software 57. The management platform must provide a highly customizable dashboard. 58. The management platform must be capable of role-based administration, enabling different sets of views and configuration capabilities for different administrators subsequent to their authentication.	
	High Availability 59. Should support Active-Active as well as Active- Passive redundancy in High Availability. 60. Should support Stateful failover for both Firewall and VPN sessions in High Availability. 61. The HA Architecture should have the ability for Device Failure Detection and Notification as well as Link Status Monitor 62. The HA Architecture should have the ability to share the load between 2 appliances in Active mode 63. The power supplies offered with UTM should be fully redundant and hot swappable. They should be rated for input power 230V/50Hz and offered with C13 power cords.	
4.18	**Internal UTMs**	**06 Nos**
	Deployment 1. The proposed device should be a dedicated appliance specifically designed for UTM functionalities. 2. The device should be offered with rack mount kit and should be rack mountable in any industry standard network rack. 3. The offered UTM devices should be configured in High Available mode and necessary licenses to be included in the offer. **Interfaces / Ports** 4. Should support 12 or more gigabit RJ45 interfaces with auto sensing 10/100/1000 capability 5. Should support minimum 2 x 10GE SFP+ slots and should be populated with SR transceivers 6. Should support 8 or more GbE SFP slots 7. Should support 1 or more Number of USB ports and minimum 1	

	Console port **Performance** 8. Must support at least 10,000,000 or more concurrent connections 9. Must support at least 200,000 or more new sessions per second processing. 10. Should have Firewall throughputs of minimum 50 Gbps or more 11. IPSec VPN throughput should be 10 Gbps or more 12. Real time NGFW throughput should be 4 Gbps or more 13. Threat Protection throughput should be 3 Gbps or more **Features & Capabilities** 14. The offered device should operate on both NAT and Transparent Modes and also IPv6 ready. 15. Should provide NAT functionality, including PAT. Should support NAT 66, NAT 64, DNS 64, Static NAT IPv4 to IPv6 and vice versa IPv6 to IPv4 tunneling or dual stack. 16. Should provide advanced NAT capabilities, supporting NAT Traversal for services like SIP/H.323 /SCCP 17. Should support Voice based protocols like H.323, SIP, SCCP, MGCP, RTP Pinholing. 18. Should support User-Group based Authentication 19. Should have provision to create secure zones / DMZ (ie Multi-Zone support) 20. Should Support Security Context or equivalent feature. Should be offered with minimum 10 licenses with the UTM. 21. Should support Packet Capture/sniffer to capture and examine the contents of individual data packets that traverse the firewall appliance for troubleshooting, diagnostics and general network activity 22. Should support more than one ISP/MPLS link with automatic ISP/MPLS link failover as well as ISP link load sharing for outbound traffic 23. Should support Device based license for Firewall. 24. OEM should be having minimum 95% Security effectiveness from latest NSS Lab's Next Generation Firewall testing report 25. The Firewall OEM should be ICSA Labs certified for Enterprise Firewall and should be Common Criteria EAL 4 certified 26. The Firewall OEM should be leaders in latest Gartner's Enterprise Firewall Magic Quadrant. 27. Should support the standards based Multi-Link aggregation technology (IEEE 802.3ad) to achieve higher bandwidth. 28. Should support VLAN tagging (IEEE 802.1q) in NAT/Route mode 29. Should support Static routing, Dynamic Routing (RIP, OSPF,BGP) Policy Based Routing 30. Should support DHCP Server, DHCP relay and DHCP client	

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functionality

31. Should have authentication for Users/Admins (Local and Remote – RADIUS, LDAP & TACACS+)
32. Support for RSA Secure ID or other Token based Products
33. The VPN (IPSec& SSL) should be integrated with firewall
34. Should support standard encryption protocols such as DES & 3DES, MD5, SHA-1, SHA-256 authentication, Diffie- Hellman, Internet Key Exchange v1, v2 algorithms, AES 128, 192 & 256
35. Should support IPSec Site-to-Site and IPSec Site-to-Client VPN tunnels.
36. Should support NAT within IPSec/SSL VPN tunnels
37. Should have a built-in Signature and Anomaly based IPS engine on the same unit
38. Should have protection for minimum 1000 IPS signatures
39. Should be able to prevent denial of service and distributed Denial of Service attacks.
40. Should support user defined signatures (i.e., Custom Signatures) with Regular Expressions.
41. The IPS should also include Botnet filtering, detecting, preventing Botnet command and control traffic
42. Should have Application control feature for all commonly used applications
43. The appliance should facilitate embedded anti-virus support
44. The Gateway AV should be supported for real-time detection of viruses and malicious code for HTTP,HTTPS, FTP, SMTP, SMTPS, POP3 and IMAP, NTP and IM protocols
45. Should have configurable policy options. Possible to select traffic to scan for viruses.
46. Should have ability of IPS Checking, application control and Antivirus scanning for IPv6 traffic and for encrypted traffic like HTTPS
47. The appliance should facilitate embedded Web Content Filtering feature.
48. The URL database should have 200 million or more URLs falling under different categories
49. Should be able to block different categories/sites based on User Authentication.

Logging & Reporting

50. Firewall should support logging to multiple syslog servers and should generate reports by integrating with other solutions. Reporting should not be done on firewall appliance and should be on a separate device.
51. The reporting tool needs to be bundled or quoted along with the solution. The logging and analysis should either be an appliance

	or on a dedicated PC/ Server platform. In case the OEM does not have an appliance for logging and reporting, the vendor should take the responsibility of supplying the hardware, OS and licenses with specified warranty. 52. The hardware/appliance should have a minimum capacity of 4 TB HDD storage configured in RAID to handle hard disk failures 53. The solution should provide comprehensive security event logging, reporting & correlation with digital forensics i.e. lawful interception & archiving of interesting popular protocol traffic such as SMTP, HTTP, POP3, IMAP, FTP, IM, NTP etc for regulatory compliances & analysis purpose 54. Logging appliance should have minimum two network ports for connectivity **Device Management** 55. Firewall should be managed through centralized management solution. It can be either appliance or vm based. 56. The centralized management platform must be accessible via a web-based interface and ideally with no need for additional client software 57. The management platform must provide a highly customizable dashboard. 58. The management platform must be capable of role-based administration, enabling different sets of views and configuration capabilities for different administrators subsequent to their authentication. **High Availability** 59. Should support Active-Active as well as Active- Passive redundancy in High Availability. 60. Should support Stateful failover for both Firewall and VPN sessions in High Availability. 61. The HA Architecture should have the ability for Device Failure Detection and Notification as well as Link Status Monitor 62. The HA Architecture should have the ability to share the load between 2 appliances in Active Active mode 63. The power supplies offered with UTM should be fully redundant and hot swappable. They should be rated for input power 230V/50Hz and offered with C13 power cords.	
4.19	**Web Application Firewalls**	**02**
	Deployment Architecture 1. The proposed WAF should be a hardware based appliance 2. The proposed WAF should be deployed in full-proxy mode 3. Should support virtualization using the route domain feature, whereby the physical device can span across multiple network	

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segments without any inter device routing. The virtualization feature should support the use of the same internal IP across the multiple network segments.

4. Should have full support IPv6. It should support all IPv6 scenarios:
5. IPv4 on the inside and IPv6 on the outside
6. IPv6 on the inside and IPv4 on the outside
7. IPv6 on the inside and outside
8. Should support VLAN, STP, LACP &Trunking
9. The proposed WAF Should have server load balancing feature also

Hardware Requirements

10. Should have a chassis height of 1U (1 Rack Unit)
11. Should have a Memory of 16GB or higher
12. Should have a Hard Disk with minimal capacity of 500 GB
13. Should have 4 x 1 Gigabit Ethernet Ports supporting copper and should also support SFP Modules if required in future
14. In addition to the above, the proposed WAF should have provision for additional 2 x 10G SFP+ ports for future
15. Should have a dedicated management port
16. Should have a USB port and front panel LCD screen for initial configuration and statistics
17. Should have dual hot swappable power supply

Device Performance

18. Should be capable to deliver at least 5 Gbps L4 / L7 Throughput and scalable to 10 Gbps
19. Should be capable to handle at least 150K or more L7 Requests per Second
20. Should be capable to support a minimum of 14M or more CONCURRENT CONNECTIONS
21. Should support 2000 or more SSL Transactions per Second

Web Application Firewall Module

22. Should be an ICSA certified network and application firewall
23. WAF should support positive and negative security model
24. The proposed WAF should be equipped with a set of pre-built application security policies that provide out-of-the-box protection for common applications
25. The proposed WAF should have a rapid deployment policy that can immediately secure the web application. These validated policies should require zero configuration time and serve as a starting point for more advanced policy creation, based on heuristic learning and specific application security needs for the application.
26. The proposed WAF should have a dynamic policy builder

	engine, which is responsible for automatic self-learning and creation of security policies. It should automatically build and manage security policies around newly discovered vulnerabilities without manual intervention. 27. The proposed WAF should at the minimum query the signature service on a daily basis and automatically downloads and apply new signatures 28. The proposed WAF should defend against the OWASP Top 10 Vulnerabilities 29. The proposed WAF should protects against various application attacks, including:a. Layer 7 DoS and DDoSb. Brute forcec. Cross-site scripting (XSS)d. Cross Site Request Forgerye. SQL injectionf. Form Field and Parameter Tampering and HPP tamperingg. Sensitive information leakageh. Session high jacking. Buffer overflowsj. Cookie manipulation/poisoning. Various encoding attacksl. Broken access controlm. Forceful browsingn. Hidden fields manipulationo. Request smugglingp. XML bombs/DoS q. HPP attacks 30. The proposed WAF should support Policy Evasion Detection Engine 31. The proposed WAF should provide Sensitive Data Leakage protection (Social Security Numbers, Cardholder Data, PII, HPI) using response scrub 32. The proposed WAF should be session aware and should be able to enforce and report session 33. The proposed WAF should protect against Remote File Inclusion Attacks 34. The proposed WAF should protect against Directory/Path traversal 35. The proposed WAF should be able to implement geo-location policies to restrict access from countries and state using inbuilt IP to location database 36. The proposed WAF should have ten in built predefined templates from common enterprise applications 37. The proposed WAF should be able to protect FTP and SMTP traffic by allowing only legitimate commands and doing protocol sanitation checks 38. The proposed WAF should prevent OS and web server fingerprinting 39. The proposed WAF should support Parser protection (XML Bombs, Recursion Attacks) 40. The proposed WAF should support XPATH injection 41. The proposed WAF should defend against Web Scrapping from	

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botnets and automated tools CAPTCHA to identify human and machine access to application

42. The proposed WAF should support ICAP, the security protocol for sending and receiving uploaded files for antivirus scanning
43. The proposed WAF should support staging of policies/attack signatures before being enforced. The staging to automatic enforcing time period should be customizable
44. The proposed WAF should provide application-specific XML filtering and validation functions that ensure the XML input of web-based applications is properly structured. It should provide schema validation, common attacks mitigation, and XML parser denial-of-service prevention.

WAF Policy Updation

45. Should support manual as well as automatic online updation of the Signatures
46. Signature updation should be independent of the underlying firmware OS
47. Signature updation should be not cause any downtime

Reporting

48. The proposed WAF should have an in-built geo location database at no additional cost
49. WAF reports should provide top attacks, top source and countries of attacks in GUI
50. The proposed WAF should support advanced reporting with standard SIEM software
51. The proposed WAF should provide geo location based reporting of the attacks
52. The proposed WAF should allow the Administrator to create customized reports.
53. All report creation should be GUI driven with drill-down options with a click
54. All reports should be in easy-to-read format for remote auditing
55. The proposed WAF should provide PCI DSS compliance and reporting
56. WAF should support AJAX/JSON application security for interactive web2.0 based applications
57. WAF should support integration with at least 4 VA scanning tools to imports the xml report and provide quick fix of the vulnerabilities
58. WAF should support syslog using TCP and UDP

High Availability

59. Should Support both Active - Active and Active - Standby topology, if HA is implemented
60. Should support transparent failover between 2 devices, the

	failover should be transparent to other networking devices, if HA is implemented 61. Should support network based failover for session mirroring, connection mirroring and heartbeat check, if HA is implemented 62. Should support config auto sync, manual sync to and from active and backup unit, if HA is implemented 63. Should support the feature to force the active device to standby and back to active state; or force a device to offline mode, if HA is implemented 64. WAF should support N+1 clustering technology to scale further if required in future **Device Administration** 65. Should provide HTTPS interface management for administering the device 66. Should provide SSH interface management for administering the device 67. Should provide troubleshooting and traffic analysis tool like tcp dump 68. Should support SNMP V1, V2c, V3 69. Should have a web dashboard that should provide the following information:• Total concurrent sessions• Throughput • New connection • CPU Usage • Memory Usage Graphs of the above data for the last 30 days should be available. 70. Should provide multiple config version option on the appliance 71. Should provide system, traffic logs on web GUI 72. Should support role based admin access with roles like no access, Guest, Operator, Application editor, Resource Administrator and Administrator 73. Should have option to change the SSL certificate used for management of the appliance **Other Features** 74. OEM should be in the leaders quadrant of Gartner's WAF Magic Quadrant 2017 75. Should have an OEM supported open, online community to learn about the proposed ADC product and related scripting language. The community should provide insight on technical topics, by developers and network engineers, and for developers and network engineers.	
4.20	**DMZ Edge Switches**	**04**
	The proposed edge switches should be offered with the following configuration: 1. Populated with 24 number of 1/10 Gbps copper ports 2. 4 number of 10 Gbps fiber ports populated with 2 number of	

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	10G SR transceivers 3. The Switches should provide support for NetFlow or sFlow based network traffic visibility 4. Each Switch should provide non-blocking switch fabric capacity at line rate 5. Each Switch should provide wire-speed packet forwarding at line rate 6. The proposed switch should support all the required ports in line rate 7. The Switches should support at least 1000 IEEE 802.1Q VLANs 8. The Switches should be offered with rack mount Kit 9. The switch should support 24,000 IPv4/IPv6 routes entries in the routing table 10. The switch should support following network protocols for IPv4 as well as IPv6: OSPF, BGP, VRRP/HSRP, VLAN, IPv6 dual stack 11. Switch should support VLAN Trunking (802.1q) 12. The switch should support 802.3ad LACP protocol for communication with downlink/uplink any third party switch or server 13. Switch should support basic Multicast IGMP v1, v2, v3 14. Switch should support IP Source Guard to prevents a malicious hosts from spoofing or taking over another host's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN 15. Switch system should support 802.1P classification and marking of packet using the following mechanisms, CoS (Class of Service), Differentiated Services Code Point, Source physical interfaces, Source/destination IP subnet, Protocol types (IP/TCP/UDP) &Source/destination TCP/UDP ports 16. The switch should support QOS & Priority Queueing 17. The Switches should be loaded with hot swappable, redundant load sharing AC power supplies to provide 1:1 power supply redundancy for the fully loaded configuration	
4.21	**Data Center Core Switches** 1. The proposed switch should be offered with the following configuration: 2. Minimum 24 number of 10 Gbps fiber ports populated with 12 nos of 10G SR transceivers for 4 switches and 24 nos of 10G SR transceivers for 2 switches . 3. Minimum64 number of 1/10 Gbps Copper ports. 4. The switch should have minimum one free slot for future expansion and should also support 40 Gbps ports for future	**06**

	expansion. 5. There should not be any single point of failure in the switch. All the main components like CPU module, switching fabric, support module, system clock, power supplies and fans etc should be in redundant configuration components, like modules/power supplies/fan tray should be hot swappable. Online insertion and removal (OIR) support is must for modules, Power supply and FAN 6. The switch should have redundant CPU's working in an active -active or active-standby mode. There should not be any traffic disruption during the CPU fail-over/change-over and the fail-over should be seamless. 7. All the process of L2 and L3 for routing and VLAN should run their own dedicated memory space. Restart of any L3 routing protocol should not hamper any other running process 8. The switch must support Hitless software upgrades(ISSU) to reduce downtime during software upgrade or downgrade 9. The switch should support in service software upgrade of the system without disturbing the traffic flow. There should not be any impact on the performance in the event of the software upgrade/downgrade. It should support for in service patching of effected process only without impacting other running processes 10. The switch must support fault isolation per process and process patching to enhance the switch availability 11. The proposed switch should support all the required ports in line rate 12. The proposed switch should have enough Memory (Flash and RAM) to hold the latest software release It should support all features of switch and parameters like MAC Address Table IP Routing Table, VLANs etc .at their peak values as claimed in the Data Sheets of the Switch. 13. The Switch should have a Truly Distributed Architecture. All Interface Modules should have all the resources for switching and routing and should offer True Local Switching(Intra-Module and Inter-Module) 14. Should comply with IEEE 802.3ae 10 Gigabit Ethernet, IEEE 802.3ba 40 Gigabit Ethernet, RFC 2460 IPv6, RFC 2461 Neighbor Discovery for IPv6, RFC 2462 IPv6 Stateless Address Auto-configuration and RFC 2463 ICMPv6. 15. Should support Ingress/Egress Queuing 16. Should support QoS scheduling with queues supported in hardware 17. Should support up-to 4 queues per port	

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18. Should support ACL based traffic classification
19. Should support IGMP v1,v2,v3.IGMP Snooping
20. Switch should support 8K IGMP Group and scalable to 32k Group with/without Multi chassis ether channel(MCEC)deployment
21. Should support Industry Standard Port/Link Aggregation for All ports. Also cross Module Link aggregation should be supported
22. Jumbo Frames support up to 9K Bytes on Gigabit/10G ports
23. Support for broadcast, multicast and unknow unicast strom control to prevent degradation of switch performance from faulty end stations
24. Should support port, subnet based 802.1Q VLANs. The switch should support 4000VLANS.The switch must support private VLAN or equivalent
25. Switch must support spine - leaf topology based on VXLAN and create large layer 2 domain to optimize east -west traffic within the datacenter to achieve participation of Hypervisor switches in spine -leaf architecture as virtual leaves
26. Switch must support multi chassis link aggregation feature and work with any downstream switch, server from various vendors
27. Switch must support IEEE 802.1BR(Bridge Port Extension) or Equivalent technology which in turn enable remote line card functionality to optimize cabling inside the data center
28. Should support routing protocol IP v4-static routing,OSPF v2,EIGRP BGPv4,IS-IS and IP v6 - BGP,OSPF v3.The switch must support Bidirectional Forwarding detection on OSPF and BGP.
29. Switch must support IP v4 - HRSP and VRRP and IP v6 - HSRP v6 and VRRP v6.It must also support DHCP Relay V4 and V6
30. Switch should support VRF-Lite and VRF Route leaking functionality. The switch should support up to 1000 VRF instances
31. Should support minimum 100k Route entries for IPv4 and IPv6 routes per line card. The switch must support 64 way ECMP
32. Switch must support virtualization features like VXLAN Gateway/Bridging and routing functionality to support VMware hypervisor connectivity and also to normalize it for VMware VM to bare metal server/VMware VM to other hypervisor VM communication
33. Should support H/W based IPv4 and IPv6 Multicasting Should support protocol Independent Multicast -Sparse Mode and PIM-SSM for IPv4and MSDP for IP v6.It should also support

	Any cast routing protocol 34. Switch should support 8K Multicast route and scalable to 32k route per line card with/without multi chassis ether channel (MCEC)deployment 35. Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should support SNMP, RMON/RMON-II,SSH, telnet, web management through network management software 36. Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch. The switch should support 16 SPAN Session and scale up to 32 SPAN session 37. Switch should support Syslog ,power on Auto provisioning, XML (NetConf), SSHv2, Telnet, OOB Management port, Console port 38. Should support Linux tools, Bash and Power Shell ,Python Shell and XMPP Client 39. The switch should support configuration verification and roll-back 40. The switch should support SNMP v1,v2c and V3 41. The total aggregate switching capacity shall be 2.6 Tbps or more per slot and packet forwarding rate should be minimum of 2.6 billion pps per slot 42. The Switch should support non-blocking layer 2 switching and layer 3 routing 43. The Backplane should be 100% Passive. Preferably back plane free design to optimize the airflow and power consumption 44. Should support Standard and Extended ACLs 45. Should support various type of ACLs like MAC Based, Port based, Vlan Based and routed ACLs 46. Should support integrated security features like DHCP snooping with option-82,Dynamic Arp Inspection, IP Source guard and Urpf (unicast reverse path forwarding) 47. Should support MAC Address Filtering based on source and destination address 48. Should support AAA, with CHAP,PAP,MS-CHAP and MS-CHAPv2.It must support LDAP,RADIUS and TACACS+ protocol as well 49. The Switch must support role based access control(RBAC)for L1,L2 and L3/Administrators 50. The switch should support control plane policing to filter the unwanted traffic to fill up the CPU queues. The switch should support user configurable Control Plane Policing(CoPP)	

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51. The proposed switch should be offered with the following configuration:
52. Minimum 24 number of 10 Gbps fiber ports populated with 6 number of 10G SR transceivers.
53. Minimum64 number of 1/10 Gbps Copper ports.
54. The switch should have minimum one free slot for future expansion and should also support 40 Gbps ports for future expansion.
55. There should not be any single point of failure in the switch. All the main components like CPU module, switching fabric, support module, system clock, power supplies and fans etc should be in redundant configuration components, like modules/power supplies/fan tray should be hot swappable. Online insertion and removal (OIR) support is must for modules. Power supply and FAN
56. The switch should have redundant CPU's working in an active -active or active-standby mode. There should not be any traffic disruption during the CPU fail-over/change-over and the fail-over should be seamless.
57. All the process of L2 and L3 for routing and VLAN should run their own dedicated memory space. Restart of any L3 routing protocol should not hamper any other running process
58. The switch must support Hitless software upgrades(ISSU) to reduce downtime during software upgrade or downgrade
59. The switch should support in service software upgrade of the system without disturbing the traffic flow. There should not be any impact on the performance in the event of the software upgrade/downgrade. It should support for in service patching of effected process only without impacting other running processes
60. The switch must support fault isolation per process and process patching to enhance the switch availability
61. The proposed switch should support all the required ports in line rate
62. The proposed switch should have enough Memory (Flash and RAM) to hold the latest software release It should support all features of switch and parameters like MAC Address Table IP Routing Table, VLANs etc .at their peak values as claimed in the Data Sheets of the Switch.
63. The Switch should have a Truly Distributed Architecture. All Interface Modules should have all the resources for switching and routing and should offer True Local Switching(Intra-Module and Inter-Module)
64. Should comply with IEEE 802.3ae 10 Gigabit Ethernet, IEEE

	802.3ba 40 Gigabit Ethernet, RFC 2460 IPv6, RFC 2461 Neighbor Discovery for IPv6, RFC 2462 IPv6 Stateless Address Auto-configuration and RFC 2463 ICMPv6. 65. Should support Ingress/Egress Queuing 66. Should support QoS scheduling with queues supported in hardware 67. Should support up-to 4 queues per port 68. Should support ACL based traffic classification 69. Should support IGMP v1,v2,v3,IGMP Snooping 70. Switch should support 8K IGMP Group and scalable to 32k Group with/without Multi chassis ether channel(MCEC)deployment 71. Should support Industry Standard Port/Link Aggregation for All ports. Also cross Module Link aggregation should be supported 72. Jumbo Frames support up to 9K Bytes on Gigabit/10G ports 73. Support for broadcast, multicast and unknow unicast strom control to prevent degradation of switch performance from faulty end stations 74. Should support port, subnet based 802.1Q VLANs. The switch should support 4000VLANS.The switch must support private VLAN or equivalent 75. Switch must support spine - leaf topology based on VXLAN and create large layer 2 domain to optimize east -west traffic within the datacenter to achieve participation of Hypervisor switches in spine -leaf architecture as virtual leaves 76. Switch must support multi chassis link aggregation feature and work with any downstream switch, server from various vendors 77. Switch must support IEEE 802.1BR(Bridge Port Extension) or Equivalent technology which in turn enable remote line card functionality to optimize cabling inside the data center 78. Should support routing protocol IP v4-static routing,OSPF v2,EIGRP BGPv4,IS-IS and IP v6 - BGP,OSPF v3.The switch must support Bidirectional Forwarding detection on OSPF and BGP. 79. Switch must support IP v4 - HRSP and VRRP and IP v6 - HSRP v6 and VRRP v6.It must also support DHCP Relay V4 and V6 80. Switch should support VRF-Lite and VRF Route leaking functionality. The switch should support up to 1000 VRF instances 81. Should support minimum 100k Route entries for IPv4 and IPv6 routes per line card. The switch must support 64 way ECMP 82. Switch must support virtualization features like VXLAN	

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Gateway/Bridging and routing functionality to support VMware hypervisor connectivity and also to normalize it for VMware VM to bare metal server/VMware VM to other hypervisor VM communication

83. Should support H/W based IPv4 and IPv6 Multicasting Should support protocol Independent Multicast -Sparse Mode and PIM-SSM for IPv4and MSDP for IP v6.It should also support Any cast routing protocol
84. Switch should support 8K Multicast route and scalable to 32k route per line card with/without multi chassis ether channel (MCEC)deployment
85. Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should support SNMP, RMON/RMON-II,SSH, telnet, web management through network management software
86. Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch. The switch should support 16 SPAN Session and scale up to 32 SPAN session
87. Switch should support Syslog ,power on Auto provisioning, XML (NetConf), SSHv2, Telnet, OOB Management port, Console port
88. Should support Linux tools, Bash and Power Shell ,Python Shell and XMPP Client
89. The switch should support configuration verification and roll-back
90. The switch should support SNMP v1,v2c and V3
91. The total aggregate switching capacity shall be 2.6 Tbps or more per slot and packet forwarding rate should be minimum of 2.6 billion pps per slot
92. The Switch should support non-blocking layer 2 switching and layer 3 routing
93. The Backplane should be 100% Passive. Preferably back plane free design to optimize the airflow and power consumption
94. Should support Standard and Extended ACLs
95. Should support various type of ACLs like MAC Based, Port based, Vlan Based and routed ACLs
96. Should support integrated security features like DHCP snooping with option-82,Dynamic Arp Inspection, IP Source guard and Urpf (unicast reverse path forwarding)
97. Should support MAC Address Filtering based on source and destination address
98. Should support AAA, with CHAP,PAP,MS-CHAP and MS-

	CHAPv2.It must support LDAP,RADIUS and TACACS+ protocol as well 99. The Switch must support role based access control(RBAC)for L1,L2 and L3/Administrators 100. The switch should support control plane policing to filter the unwanted traffic to fill up the CPU queues. The switch should support user configurable Control Plane Policing(CoPP)	
4.22	**Internet Core Switches**	**02**
	1. The proposed switch should be offered with the following configuration: 2. 24 number of 10 Gbps fiber ports populated with 6 numbers of 10G SR transceivers. 3. 48 number of 1/10 Gbps Copper ports 4. 24 number of 1 Gbps Copper POE/POE+ ports 5. The switch should have minimum one free slot for future expansion and should also support 40 Gbps ports for future expansion 6. There should not be any single point of failure in the switch. All the main components like CPU module, switching fabric, support module, system clock, power supplies and fans etc should be in redundant configuration components, like modules/power supplies/fan tray should be hot swappable. Online insertion and removal (OIR) support is must for modules, Power supply and FAN 7. The switch should have redundant CPU's working in an active - active or active-standby mode. There should not be any traffic disruption during the CPU fail-over/change-over and the fail-over should be seamless. 8. All the process of L2 and L3 for routing and VLAN should run their own dedicated memory space. Restart of any L3 routing protocol should not hamper any other running process 9. The switch must support Hitless software upgrades(ISSU) to reduce downtime during software upgrade or downgrade 10. The switch should support in service software upgrade of the system without disturbing the traffic flow. There should not be any impact on the performance in the event of the software upgrade/downgrade. It should support for in service patching of effected process only without impacting other running processes 11. The switch must support fault isolation per process and process patching to enhance the switch availability 12. The proposed switch should support all the required ports in line rate	

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13.	The proposed switch should have enough Memory (Flash and RAM) to hold the latest software release. It should support all features of switch and parameters like MAC Address Table, IP Routing Table, VLANs etc .at their peak values as claimed in the Data Sheets of the Switch.
14.	The Switch should have a Truly Distributed Architecture. All Interface Modules should have all the resources for switching and routing and should offer True Local Switching(Intra-Module and Inter-Module)
15.	Should comply with IEEE 802.3ae 10 Gigabit Ethernet, IEEE 802.3ba 40 Gigabit Ethernet, and RFC 2460 IPv6, RFC 2461 Neighbor Discovery for IPv6, RFC 2462 IPv6 Stateless Address Auto-configuration and RFC 2463 ICMPv6.
16.	Should support Ingress/Egress Queuing
17.	Should support QoS scheduling with queues supported in hardware
18.	Should support up to 4 queues per port
19.	Should support ACL based traffic classification
20.	Should support IGMP v1,v2,v3,IGMP Snooping
21.	Switch should support 8K IGMP Group and scalable to 32k Group with/without Multi chassis ether channel(MCEC)deployment
22.	Should support Industry Standard Port/Link Aggregation for All ports. Also cross Module Link aggregation should be supported
23.	Jumbo Frames support up to 9K Bytes on Gigabit/10G ports
24.	Support for broadcast, multicast and unknown unicast storm control to prevent degradation of switch performance from faulty end stations
25.	Should support port, subnet based 802.1Q VLANs. The switch should support 4000VLANs.The switch must support private VLAN or equivalent
26.	Switch must support spine - leaf topology based on VXLAN and create large layer 2 domain to optimize east -west traffic within the datacenter to achieve participation of Hypervisor switches in spine -leaf architecture as virtual leaves
27.	Switch must support multi chassis link aggregation feature and work with any downstream switch, server from various vendors
28.	Switch must support IEEE 802.1BR(Bridge Port Extension) or Equivalent technology which in turn enable remote line card functionality to optimize cabling inside the data center
29.	Should support routing protocol IP v4-static routing, OSPF v2, EIGRP BGPv4,IS-IS and IP v6 - BGP,OSPF v3.The switch must support Bidirectional Forwarding detection on OSPF and BGP.
30.	Switch must support IP v4 - HRSP and VRRP and IP v6 - HSRP

	v6 and VRRP v6.It must also support DHCP Relay V4 and V6 31. Switch should support VRF-Lite and VRF Route leaking functionality. The switch should support up to 1000 VRF instances 32. Should support minimum 100k Route entries for IPv4 and IPv6 routes per line card. The switch must support 64 way ECMP 33. Switch must support virtualization features like VXLAN Gateway/Bridging and routing functionality to support VMware hypervisor connectivity and also to normalize it for VMware VM to bare metal server/VMware VM to other hypervisor VM communication 34. Should support H/W based IPv4 and IPv6 Multicasting. Should support protocol Independent Multicast -Sparse Mode and PIM-SSM for IPv4and MSDP for IP v6.It should also support Any cast routing protocol 35. Switch should support 8K Multicast route and scalable to 32k route per line card with/without multi chassis ether channel (MCEC)deployment 36. Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should support SNMP, RMON/RMON-II, SSH, telnet, web management through network management software 37. Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch. The switch should support 16 SPAN Session and scale up-to 32 SPAN session 38. Switch should support Syslog, power on Auto provisioning, XML (NetConf), SSHv2, Telnet, OOB Management port, Console port 39. Should support Linux tools ,Bash and Power Shell, Python Shell and XMPP Client 40. The switch should support configuration verification and roll-back 41. The switch should support SNMP v1,v2c and V3 42. The total aggregate switching capacity shall be 2.6 Tbps or more per slot and packet forwarding rate should be minimum of 2.6 billion pps per slot 43. The Switch should support non-blocking layer 2 switching and layer 3 routing 44. The Backplane should be 100% Passive. Preferably back plane free design to optimize the airflow and power consumption 45. Should support Standard and Extended ACLs 46. Should support various type of ACLs like MAC Based, Port based, Vlan Based and routed ACLs 47. Should support integrated security features like DHCP snooping	

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	with option-82,Dynamic Arp Inspection, IP Source guard and Urpf(unicast reverse path forwarding)
48.	Should support MAC Address Filtering based on source and destination address
49.	Should support AAA, with CHAP,PAP,MS-CHAP and MS-CHAPv2.It must support LDAP,RADIUS and TACACS+ protocol as well
50.	The Switch must support role based access control(RBAC)for L1,L2 and L3/Administrators
51.	The switch should support control plane policing to filter the unwanted traffic to fill up the CPU queues. The switch should support user configurable Control Plane Policing(CoPP)
52.	The proposed switch should be offered with the following configuration:
53.	24 number of 10 Gbps fiber ports populated with 6 numbers of 10G SR transceivers.
54.	48 number of 1/10 Gbps Copper ports
55.	24 number of 1 Gbps Copper POE/POE+ ports
56.	The switch should have minimum one free slot for future expansion and should also support 40 Gbps ports for future expansion
57.	There should not be any single point of failure in the switch. All the main components like CPU module, switching fabric, support module, system clock, power supplies and fans etc should be in redundant configuration components, like modules/power supplies/fan tray should be hot swappable. Online insertion and removal (OIR) support is must for modules, Power supply and FAN
58.	The switch should have redundant CPU's working in an active - active or active-standby mode. There should not be any traffic disruption during the CPU fail-over/change-over and the fail-over should be seamless.
59.	All the process of L2 and L3 for routing and VLAN should run their own dedicated memory space. Restart of any L3 routing protocol should not hamper any other running process
60.	The switch must support Hitless software upgrades(ISSU) to reduce downtime during software upgrade or downgrade
61.	The switch should support in service software upgrade of the system without disturbing the traffic flow. There should not be any impact on the performance in the event of the software upgrade/downgrade. It should support for in service patching of effected process only without impacting other running processes
62.	The switch must support fault isolation per process and process patching to enhance the switch availability

	63.	The proposed switch should support all the required ports in line rate	
	64.	The proposed switch should have enough Memory (Flash and RAM) to hold the latest software release. It should support all features of switch and parameters like MAC Address Table, IP Routing Table, VLANs etc .at their peak values as claimed in the Data Sheets of the Switch.	
	65.	The Switch should have a Truly Distributed Architecture. All Interface Modules should have all the resources for switching and routing and should offer True Local Switching(Intra-Module and Inter-Module)	
	66.	Should comply with IEEE 802.3ae 10 Gigabit Ethernet, IEEE 802.3ba 40 Gigabit Ethernet, and RFC 2460 IPv6, RFC 2461 Neighbor Discovery for IPv6, RFC 2462 IPv6 Stateless Address Auto-configuration and RFC 2463 ICMPv6.	
	67.	Should support Ingress/Egress Queuing	
	68.	Should support QoS scheduling with queues supported in hardware	
	69.	Should support up to 4 queues per port	
	70.	Should support ACL based traffic classification	
	71.	Should support IGMP v1,v2,v3,IGMP Snooping	
	72.	Switch should support 8K IGMP Group and scalable to 32k Group with/without Multi chassis ether channel(MCEC)deployment	
	73.	Should support Industry Standard Port/Link Aggregation for All ports. Also cross Module Link aggregation should be supported	
	74.	Jumbo Frames support up to 9K Bytes on Gigabit/10G ports	
	75.	Support for broadcast, multicast and unknown unicast storm control to prevent degradation of switch performance from faulty end stations	
	76.	Should support port, subnet based 802.1Q VLANs. The switch should support 4000VLANs.The switch must support private VLAN or equivalent	
	77.	Switch must support spine - leaf topology based on VXLAN and create large layer 2 domain to optimize east -west traffic within the datacenter to achieve participation of Hypervisor switches in spine -leaf architecture as virtual leaves	
	78.	Switch must support multi chassis link aggregation feature and work with any downstream switch, server from various vendors	
	79.	Switch must support IEEE 802.1BR(Bridge Port Extension) or Equivalent technology which in turn enable remote line card functionality to optimize cabling inside the data center	
	80.	Should support routing protocol IP v4-static routing, OSPF v2, EIGRP BGPv4,IS-IS and IP v6 - BGP,OSPF v3.The switch must	

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support Bidirectional Forwarding detection on OSPF and BGP.

81. Switch must support IP v4 - HRSP and VRRP and IP v6 - HSRP v6 and VRRP v6.It must also support DHCP Relay V4 and V6
82. Switch should support VRF-Lite and VRF Route leaking functionality. The switch should support up to 1000 VRF instances
83. Should support minimum 100k Route entries for IPv4 and IPv6 routes per line card. The switch must support 64 way ECMP
84. Switch must support virtualization features like VXLAN Gateway/Bridging and routing functionality to support VMware hypervisor connectivity and also to normalize it for VMware VM to bare metal server/VMware VM to other hypervisor VM communication
85. Should support H/W based IPv4 and IPv6 Multicasting. Should support protocol Independent Multicast -Sparse Mode and PIM-SSM for IPv4and MSDP for IP v6.It should also support Any cast routing protocol
86. Switch should support 8K Multicast route and scalable to 32k route per line card with/without multi chassis ether channel (MCEC)deployment
87. Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should support SNMP, RMON/RMON-II, SSH, telnet, web management through network management software
88. Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch. The switch should support 16 SPAN Session and scale up-to 32 SPAN session
89. Switch should support Syslog, power on Auto provisioning, XML (NetConf), SSHv2, Telnet, OOB Management port, Console port
90. Should support Linux tools ,Bash and Power Shell, Python Shell and XMPP Client
91. The switch should support configuration verification and roll-back
92. The switch should support SNMP v1,v2c and V3
93. The total aggregate switching capacity shall be 2.6 Tbps or more per slot and packet forwarding rate should be minimum of 2.6 billion pps per slot
94. The Switch should support non-blocking layer 2 switching and layer 3 routing
95. The Backplane should be 100% Passive. Preferably back plane free design to optimize the airflow and power consumption
96. Should support Standard and Extended ACLs
97. Should support various type of ACLs like MAC Based, Port

	based, Vlan Based and routed ACLs 98. Should support integrated security features like DHCP snooping with option-82,Dynamic Arp Inspection, IP Source guard and Urpf(unicast reverse path forwarding) 99. Should support MAC Address Filtering based on source and destination address 100. Should support AAA, with CHAP,PAP,MS-CHAP and MS-CHAPv2.It must support LDAP,RADIUS and TACACS+ protocol as well 101. The Switch must support role based access control(RBAC)for L1,L2 and L3/Administrators 102. The switch should support control plane policing to filter the unwanted traffic to fill up the CPU queues. The switch should support user configurable Control Plane Policing(CoPP)	
4.23	**Network Edge Switches - specifications**	**10 Nos**
	1. Rack mount with rail kit 2. 24 x 10/100/1000Mbps Ethernet copper RJ-45 ports 3. 2 uplinks of 10GbE flexibility populated with 10GbE (10G Base SR) 4. 160 Gbps switching capacity and 65.5 Mpps throughput 5. Layer2 and Layer3 switching functionality 6. 12,000 MAC addresses and 11,000 unicast routes 7. VLANs support, Per VLAN STP 8. Routing protocols like BGP, OSPF, IS-IS, RIP, static route 9. VRRP, Multicast routing protocol and VRF-lite protocols 10. IEEE 802.1AE MACsec for layer 2 11. Automatic Quality of Service for easy configuration of QoS 12. IEEE 802.1x, DHCP snooping, DHCP Option 82, Dynamic ARP Inspection (DAI), dynamic port based security providing user authentication, IP source guard, dynamic VLANs, Private VLANs, Private LAN edge, secure shell, SNMPv3, Kerberos, TACACS+, RADIUS 13. VLAN ACLs and port-based ACLs (PACLs) 14. Active traffic monitoring and analysis for IP applications and services 15. SPAN, RSPAN, telnet client, BOOTP, TFTP, RMON, Web-based management 16. Management console port with cable 17. Redundant power supplies and fans	
4.24	**SAN Switches**	**10 Nos**
	1. The Fiber Channel Switch should provide Non-blocking Architecture with 64 FC Ports in a Single Domain Concurrently Active at 16 Gbit/sec Full Duplex with No Oversubscription. 2. The Fiber Channel Switch should support auto-sensing 2, 4, 8,	

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10 and 16 Gbit/sec FC capabilities.

3. The Fiber Channel Switch should be loaded with 64 16Gbit/sec SWL Transceivers.
4. The Fiber Channel Switch should support different port types such as F_Port, M_Port (Mirror/SPAN Port), EX_port and E_Port.
5. The Fiber Channel Switch should support Non-Disruptive Microcode/ Firmware Upgrades and Hot Code Activation.
6. The Fiber Channel Switch should provide redundant and hot-pluggable components.
7. The Fiber Channel Switch should provide a minimum Aggregate Bandwidth of 1024 Gbit/sec: 64 ports × 16 Gbit/sec (data rate) end to end.
8. The Fiber Channel Switch should support Quality of Service (QoS) to help optimize application performance in consolidated, virtual environments. It should be possible to define high, medium and low priority QOS zones to expedite high priority traffic.
9. The Fiber Channel Switch should be configured with the Zoning and ISL Licenses
10. The Fiber Channel Switch should support for web based management and should also support CLI.
11. The Fiber Channel Switch should support Advanced Zoning and ACL to simplify administration and significantly increase control over data access.
12. The Fiber Channel Switch should support POST and online/offline diagnostics, including RAStrace logging, environmental monitoring, non-disruptive daemon restart, FCping and Pathinfo (FC traceroute), port mirroring (SPAN port).
13. The Fiber Channel Switch should support Automation that Simplifies Policy based Monitoring and Alerting
14. The Fiber Channel Switch should support Identifying, Monitoring and Analyzing Performance of Specific Flows or Frame Types
15. The Fiber Channel Switch should support Cable and Optic Diagnostics that Simplify the Deployment and Support of Large Fabrics
16. The Fiber Channel Switch should Automatically Detects and Recovers from Bit Errors, Negating need for Retransmission
17. The Fiber Channel Switch should support ASIC/HW Enabled Buffer Credit Loss Automatic Detection/Recovery
18. The Fiber Channel Switch should support 10G FC for DWDM Connections

	19. The Fiber Channel Switch should support 128Gbps Frame based Trunking 20. The Fiber Channel Switch should have Minimum 8000 plus buffers 21. The Fiber Channel Switch should be configured with 4-post rack mount Kit. 22. The Fiber Channel Switch should be loaded with hot swappable, redundant load sharing AC power supplies to provide 1:1 power supply redundancy for the fully loaded configuration. All Power Supply Module slots should be occupied with Power Supplies.	
4.25	**Wifi Routers**	**05**
	1. Wireless Router with 4 Ethernet ports and one built in ADSL/ one Fast Ethernet port can be used as WAN port to connect to cable/fibre modem 2. Wireless speeds upto 300 Mbps as per IEEE standard 802.11 3. Four (4) 10/100 Fast Ethernet ports with autosensing technology and One (1) ADSL2+ port, USB 3.0 Port 4. The router should have the IEEE 802.11 b/g/n 2.4GHz standards 5. IPv6 Support (Internet Protocol Version 6) 6. Supports Wi-Fi Protected Access (WPA/WPA2—PSK) 7. Supports Intrusion detection and prevention (IDS) 8. Supports Denial-of-service (DoS) attack prevention 9. 3-year warranty	
4.26	**A3 Network Multi function Color Printer**	**4**
	1. A3 photo Colour copier with Network Printer and Color Network Scanner Duplex 2. Laser technology based color and B/W printing 3. True 1200x1200 dpi or better 4. Media Sizes: A3, A4, B5, Letter, Legel, 11"x17", tabloid,12"x18" and other standard sizes, banner printing 5. Gigabit Ethernet network, USB interfaces with necessary drivers 6. Memory : 2 GB RAM or higher 7. Hard Disk : 160 GB or better 8. True Post Script color 9. Maximum print speed of 25 ppm clor or B/W 10. Automatic two side Duplex printing 11. Standard input tray, Multipurpose tary and additional trays for total capacity of above 3000 sheets 12. Media Types support : Plain Paper, gloss, coated, plastic, transparency and media thickness upto 300 gsm 13. Direct PDF file Printing 14. Job Pipelining, accounting, extended font storage and print job tracking	

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	15. Control panel based device setup embedded web server and remote printing management. 16. Initial set of all consumables including toner catridges, Imaging units, waste catridges, suction filter and IBT cleaner Unit 17. Printer drivers should be compatible with All latest OS Platforms Like Microsoft Windows 8/10, Microsoft® Windows® 7 Ultimate/ Professional/ Home Premium, Windows® Server 2016/19 (32-bit, 64-bit), Citrix XenApp, Citrix XenServer 18. Media sizes from 88 x 99 mm to 320 x 1,219 mm 19. All associated power cables, connectors, adapters, drivers and startup softwares 20. Consumables: 1 set of cartridges (full capacity) comprising of all colors 21. Three year comprehensive onsite warranty and technical support
4.27	**IP KVM Switch**
	1. The KVM switch should have 16 ports 2. The KVM should provide 2 concurrent port accesses through IP sessions. 3. KVM should have VGA/DVI digital local port for enhanced local administration 4. The KVM should provide an additional port session thru local port making the total port access (2 Concurrent IP users + 1 thru Local port). 5. The KVM should be able to take control of servers from BIOS level. 6. The KVM should facilitate both in-band and out-of-band access. 7. The KVM should have the capability to integrate with intelligent PDU to on/off/recycle power of remote device at port level. 8. KVM should be capable of connecting to Servers/Headless Servers/Serial Devices directly or thru additional connectivity modules. The necessary cables required for connecting the servers to KVM switches should be provided. 9. KVM should have Dual power and dual Gigabit Ethernet with automatic failover. 10. KVM should support Virtual Media to remotely install OS and software. 11. KVM should connect directly thru a non-converted interface module to Digital video outputs such as DVI/HDMI/Display Port etc. 12. KVM should have the capability to provide audio over IP to monitor audio applications on remote servers. 13. KVM should be capable of Absolute Mouse Synchronization out of the box.

	14. It should support High Definition (HD) remote video resolution — 1920x1080, including widescreen formats such as 1680x1050 and 1600x1200. 15. KVM should be able to allow Server access from Windows, Linux, Sun or Mac desktops via a wide range of Web browsers or standalone client. 16. KVM should have Tiering/ Cascading/ Daisy Channing capacity to access minimum 16 to maximum 1024 servers. 17. The KVM should be capable of providing view access of a connected server to multiple IP users. 18. It should support 256-bit SSL AES or 128-bit RC4 encryption. 19. Single window access to all the equipment connected to the switch, equipment access logs, and event history and should send email alerts based on log details as triggers. 20. It should have the capability to integrate with centralized management tool to give central access to multiple devices i.e. KVM switches, Serial consoles and IPDUs. **19" TFT monitor/ Console Specifications** 21. Form Factor - 1U 19-inch Rack mountable 22. Display Type - 19" A grade LCD, LED backlight 23. Display Size -19" TFT 24. Video Input - VGA / DVI 25. Contrast Ratio - Min 1000:01:00 26. Display Colors - Min 16.7 million 27. Resolution - Min 1280x1024 @75 Hz 28. Keyboard - Notebook style 29. Number of Keys - 104 keys with number pad 30. Pointing Device - Integrated touchpad 31. Power - 110-240V, 50~60Hz, auto-sensing	
4.28	**Anti-Virus**	**3 Lots**
	1. Vendor should quote comprehensive Antivirus Solution for about 100 clients. 2. The vendor should supply server and client version with on-line updates and upgrades. 3. The Antivirus software should run on existing hardware system. 4. The solution shall be licensed and supported for 3 years.	
4.29	**Network Management Software**	**02**
	Specifications of each Work Station 1. The NMS should present a customizable at-a-glance summary of all discovered Network devices and third-party Network devices, including inventory and event summary information that can be used to proactively identify problem areas and help prevent network downtime.	

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	2. The NMS should provide Intelligent, customizable dashboard and historical data visibility. The dashboard should present an at-a-glance summary of all discovered Network devices and third-party Network devices, including inventory and event summary information used to identify problem areas and help prevent network downtime. 3. The NMS should provide Real-Time Performance Data Collection, Monitoring, and Graphical Display (across Ethernet, FCoE, FC, FCIP, and Gigabit Ethernet [GbE] ports and connections). It also should include support for both performance data (Tx/Rx) and error counters (CRC/sync loss errors, signal losses, and link failures). 4. The NMS should provide Historical Performance Data Collection, Monitoring, and Graphical Displays (across Ethernet, FCoE, FC, FCIP, and Fibre Channel Routing [FCR] ports and connections); includes support for both performance data (Tx/Rx) and error counters. 5. The NMS should provide End-to-end monitoring (both Real-Time and Historical) from Source (Application) to Target (Disk) 6. The NMS should provide Top Talker monitoring to determine the data flows that are the major users of bandwidth; bandwidth usage is measured in real time relative to the port on which the monitor is installed. 7. The NMS should provide Policy-based, user-defined performance thresholds with Color-coded Traffic Status on the Topology. 8. The NMS should support the needs of different network teams by providing full Role-Based Access Control (RBAC). 9. The NMS should support troubleshooting use cases with rapid navigation to identify problem areas 10. The NMS should provide powerful Event Manager feature that helps troubleshoot network-related issues. The Event Manager should be capable of receiving Simple Network Management Protocol (SNMP) traps and syslog events messages for reporting, analysis, monitoring, and remediation. The trap forwarding feature should allow the NMS to filter SNMP traps and send them to third-party applications that are capable of managing events from multiple vendors. 11. The NMS should support Call Home features that automatically collects diagnostic information in response to predefined and user-defined events and sends notifications to technical support organizations for faster fault diagnosis, isolation, and remote support operations.	
4.30	**Server Racks** **[6 Nos. at ICR-ER Data Centre, NDCC-II Building, New Delhi**	**07 Nos**

	and 1 No. at Norh Block,New Delhi]	
	Specifications of Server Rack 1. Floor Standing Server Rack 19" 45U, with castor wheels (set of 4 per rack) 2. The racks should conform to EIA-310 Standard for Cabinets, Racks, Panels and Associated Equipment and accommodate industry standard 19" rack mount equipment 3. Shall have single hinge perforated front door, split perforated rear doors and solid side panels 4. All Racks should be provided with complete Protective grounding and bonding solution 5. All racks should be supplied with 2 Packs of mounting hardware and 10 numbers of Blanking Panels of different sizes (1U, 2U, 4U) 6. Racks should be compatible with floor-throw as well as top-throw data centre cooling systems 7. Racks should have Rear Cable Management channels, Roof and base cable access 8. Wire managers: Two vertical and two horizontal 9. Each rack shall have two nos. of intelligent networked vertical power outlet units 10. Must be provided with 2 nos (4"x4"-1no and 4"x6" – 1no) of cool boot accessories 11. Intelligent Power distribution Unit - Vertically Mounted, IEC C13 with 20 Power Outputs. (15 Power outs of 32AMPs sockets & 5 Power outs of 5/13Amp sockets), Electronically controlled circuits for Surge & Spike protection, 32AMPS MCB, 3KVAC isolated input to Ground & Output to Ground (2 Nos per Rack). As per below Specifications **IPDU specifications:** 12. IP based rack power distribution units (PDUs) to offer real-time remote unit-level power monitoring of current (amps), voltage, power (kVA, kw), power factor and energy consumption (kWh) with ISO/IEC +/- 1% billing-grade accuracy (socket level) 13. It should support plug-and-play environmental sensors 14. Intelligent PDU should support user defined thresholds and send alerts if required 15. PDU should have field replaceable controller to avoid downtime in case of any failure on the controller 16. PDU should support monitoring of residual current which Reduces the risk of electric shock by measuring current flowing in the ground wire 17. PDU's should have LED and alarms for unbalanced loads based on user-adjustable thresholds. IPDU's should have	

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	smart reversible LED/LCD display that changes orientation. 18. It should integrate with centralize4 power control, analytics and monitoring solutions like DSview, DCIM and PowerIQ. It should be integrated with existing central management solution 19. IPDU" s should meet ISO 9000 quality manufacturing and quality components from Tyco, Hubbell and Mennekes 20. IPDU"s should contain UL489 circuit breakers which meets Underwriters Laboratories latest branch circuit protection standards. 21. PDU should have the capability to control individual outlet on PDU over IP to switch on/off/recycle 22. PDU should have the capability of connecting to each other via grouping/cascading/daily chain 23. Circuit breaker should be in a closed housing to prevent accidental tripping 24. PDU should have two different colors for source A and source B other than black, grey and white 25. Secure lock cables with different colors need to be included in the BOM to accommodate the sockets on the PDU for source A and B 26. PDU should be supplied and temperature and humidity sensor as per the ASHRAE guidelines. 27. Each PDU should have min 20 x IEC C-13 and 4 x IEC C-199 outlets that support the IT devices allocated in the Rack 28. PDU should support single phase 32Amps 29. PDU shall have gigabit Ethernet port. PDU should have dual networking ports for dual network access and cascading.	
4.31	**Network Racks**	**04**
	1. 45U size 2. Shall have cabinet frame with top panel 3. Shall have dual hinge perforated front door opening to left or right, split perforated rear doors and solid side panels 4. Should be available in 4-Post configurations 5. Shall have 84" H X 31.5" W X 41" D dimensions 6. Material: The cabinet shall be constructed of steel material 7. Finish: Durable black epoxy powder-coat 8. Shall have 4 caster wheels per rack 9. EIA-310-E Compliant 10. UL Listed, Certification - Information Technology and Communications equipment 11. Mounting bracket shall be provided to mount 1RU EIA 19" copper and fiber patch panels vertically 12. Bracket for vertical POU mounting	

	13. Optional air sealing grommet for better airflow on the bottom and top of cabinet cable entry cutouts 14. In cabinet ducting solutions to be provisioned to enable optimized airflow of switches with side-to-side airflow patterns by establishing front-to-back airflow patterns through the cabinet for better thermal management 15. Must be provided with 2 nos (4"x4"-1no and 4"x6" – 1no) of cool boot accessories 16. Network cabinet package shall include one left and one right slack spool and mounting brackets 17. Shall have cable management finger kit 18. Shall have angled modular 24 port patch panels 19. Intelligent Power distribution Unit - Vertically Mounted, 32AMPs with 20 Power Outputs. (20 Power outs of IEC 320 C13 Sockets & 5 Power outs of 5/13Amp Sockets), Electronically controlled circuits for Surge & Spike protection, 32AMPS MCB, 3KVAC isolated input to Ground & Output to Ground (2 Nos per Rack). As given below **IPDU specifications:** 30. IP based rack power distribution units (PDUs) to offer real-time remote unit-level power monitoring of current (amps), voltage, power (kVA, kw), power factor and energy consumption (kWh) with ISO/IEC +/- 1% billing-grade accuracy (socket level) 31. It should support plug-and-play environmental sensors 32. Intelligent PDU should support user defined thresholds and send 33. PDU should have field replaceable controller to avoid downtime in case of any failure on the controller 34. PDU should support monitoring of residual current which Reduces the risk of electric shock by measuring current flowing in the ground wire 35. PDU's should have LED and alarms for unbalanced loads based on user-adjustable thresholds. IPDU's should have smart reversible LED/LCD display that changes orientation. 36. It should support user-adjustable power data sampling and buffering. With Standards based polling, configuration and alerting with encryption via SNMP v1, v2, v3 support, SETs, GETs and TRAPs. 37. IPDU" s should meet ISO 9000 quality manufacturing and quality components from Tyco, Hubbell and Mennekes 38. IPDU"s should contain UL489 circuit breakers which meets Underwriters Laboratories latest branch circuit protection standards. 39. PDU should have the capability to control individual outlet on	

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	PDU over IP to switch on/off/recycle 40. PDU should have the capability of connecting to each other via grouping/cascading/daily chain 41. Circuit breaker should be in a closed housing to prevent accidental tripping 42. PDU should have two different colors for source A and source B other than black, grey and white 43. Secure lock cables with different colors need to be included in the BOM to accommodate the sockets on the PDU for source A and B 44. PDU should be supplied and temperature and humidity sensor as per the ASHRAE guidelines. 45. Each PDU should have min 20 x IEC C-13 and 4 x IEC C-199 outlets that support the IT devices allocated in the Rack 46. PDU should support single phase 32Amps 47. PDU shall have gigabit Ethernet port. PDU should have dual networking ports for dual network access and cascading.	
4.32	**Network cabling**	**1 Lot**
	1. For the server, client, storage and network configurations as indicated by the architecture, UTP I/O terminations, I/O outlets, fiber & UTP patch panels and patch cords should be provided. As an estimate, there are about 16 racks, 40 servers and 70 client workstations/ desktops in data centre server room and nearby/ adjacent rooms. 2. Required fiber optic cabling and terminations to interconnect the hosts, data centre switches, network switches, storages arrays and tape library positioned in different racks should be supplied and installed as per the structured cabling standards. 3. All the cables including fiber optic should be laid up to the rack level in the data centre. 4. Dedicated raceways / cable-trays should be used for laying cables to avoid interference from power cables. Fiber and Ethernet cabling should have separate raceways / cable-trays 5. There should be enough space between data and power cabling and there should not be any cross wiring of the two, in order to avoid any interference or corruption of data 6. Cables shall be neatly arranged on the trays in such manner that a criss-crossing is avoided and final take off to switch gear is easily facilitated. 7. The overhead fiber cable routing system shall be a system of channel, fittings, and brackets designed to segregate, route, and protect fiber optic and high performance copper cabling. Must use Panduit make fiber trays or high quality equivalent. 8. The overhead copper cable routing system shall be based on Wire-	

	Mesh Cable Trays formed into a standard 3.7-by-5-inch (94-by-127-mm) wire mesh pattern with intersecting wires welded together with at least one bottom longitudinal wire along entire length of section. Required to use straight sections in standard 118-inch (3000-mm) lengths and standard widths: [12-inches (305 mm)] [18-inches (457 mm)] [24-inches (610 mm)] [30-inches (762 mm)]. Must use Panduit make copper cable trays or high quality equivalent. 9. UTP and Fiber fully loaded/ populated patch panels, connectors, terminations of sufficient adequate and spare capacities should be provided and installed in all the racks are to be supplied and installed. 10. Servers will normally be connected by CAT6/ 6A RJ45–RJ45 patch cords or 10G MM fiber (10GBaseSR) patch cords from patch panels. 11. Network racks will have network switches and jack panels. Interconnect path between the switches and jack panels should be done using RJ45 patch cords. For 10G and FC links, fiber patch cords are to be used and installed. 12. Sufficiently adequate no of UTP and Fiber patch cables with spare capacity needs to be provided for all I/O sockets and for patch panel to switch connections. 13. Vendor should provide about all the required UTP I/O sockets all the designated locations including walls and modular furniture. 14. The vendor has to prepare and submit the detailed network diagram and its plan of laying UTP and fiber optic cable routes for approval. 15. Termination of cabling components: UTP cables and fiber optic cables shall be done with labels and marking as per approved labeling plan 16. All cables will be labeled close to their termination points by cable number as per cabling diagram. Cable numbers are to be punched on PVC ferruling tube or any other appropriate standard labeling and securely fastened	

Description of Articles indented

5. Supply, laying, installation, integration , testing and commissioning of the following network systems as per the details given below.

Sl	Generic name of the item with detailed specifications	Quantity

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No		
5	**Communication Network** - Robust, reliable and uninterrupted network for data receiving and dissemination from control room to various users spread across the country. It is integrated with all standard network equipment along with redundant leased lines as a backbone.	
5.1	**Internet Link – NDCC, New Delhi** 1. Supply, Installation, Commissioning and Configuration of independent (from different ISPs as redundant links) Internet Leased Line connectivity link with required bandwidth and necessary hardware (Cabling, Modems etc.,) up to CPE as per the following table. Required Routers and Firewall will be provided by the end user. • Type of circuit – Internet • Bandwidth - 200 Mbps (scalable to 2 Gbps) • Type of service - One time installation cost including cabling, modems, mux etc. in establishment of 200 Mbps and Recurring cost/ Link subscription charges for providing 200 Mbps bandwidth for ONE year • Port – Ethernet • Service start – From the date of installation and acceptanace 2. This tender is issued for supply, installation and commissioning of Internet leased line bandwidth for hosting a world wide website at NDCC, New Delhi. 3. Scope of work is to provide each Internet leased line connectivity of 200 Mbps (Enhancible up-to 2 Gbps) on un compressed, unshared leased line (1:1)at NDCC, New Delhi including installation, commissioning, testing &up keep of the complete link for the service period from the date of release of work order . However, the service may be extended by another two years (one year at a time) based on satisfactory performance. The connectivity will be through dedicated Internet service. The minimum guaranteed bandwidth taken from the vendor is 200Mbps. 4. The bidder should be a class-A Internet service provider (ISP)with NLD/ ILD /ISP licenses and should be capable of providing MPLSVPN through Fiber for backbone 5. The bidder should be having is own Internet gateway and have its own fiber cable and ingstation 6. The bidder should have his own last mile fiber connectivity with underground connectivity which will terminate at NDCC, New Delhi. 7. The bidder should provide the service built upon ring topology with Fiber connection including last mile Ethernet based solution and shall include the necessary end equipment. 8. Bidder should ensure the availability and reliability of the line through a similar redundant line which will be used in case of service failure. This redundant link should work in auto-failover mode. i.e., the secondary	2

line should be active automatically incase primary line goes down completely

9. Both primary and secondary line should be provided in ring topology. The ring paths for each line must be provided from two different pop.
10. The bidder should be a company registered in India and doing business in India with applicable ISO certification
11. The bidder should provide official and valid references in respect of similar projects completed for the past 3years with documentary proof.
12. The bidder should have its own Network Operations Centre (NOC).
13. The bidder should have the capability of increasing/decreasing bandwidth on demand and should be willing to change the band width up or down on demand in multiples of 50Mbps. The change in bandwidth must be provided within 15 days after the intimation.
14. Price for increasing and decreasing bandwidth In multiples 50 Mbps requirements other than base price for 200Mbps will be computed based on the pro rate basis as per the price given for recurring cost for 200 Mbps link.
15. The bidder should provide minimum of 64 public IP addresses in IPV4/ IPV6format including Reverse Lookups configured at theseIPs. It will be upgraded to 128 public IP as and when required.
16. The bidder should have service facilities with 24hrs.x7 technical Support by NOC.
17. Minimum Bandwidth for up-link / Down-link shall not be below 95% of committed bandwidth.
18. The bidder should be in existence for the last 5 years.
19. The Vendor should produce the validity of TRAI license with documentary proof and OT license to operate International gateways.
20. End user reserves the right to distribute the bandwidth for its applications.
21. The connectivity will be through dedicated leased optical fiber line. The communication should be through dedicated fiber cores and not through MPLS network.
22. The Vendor will be responsible for comprehensive maintenance during the period of service contract entire warranty period. Warranty period will start after acceptance of installation & testing of complete connectivity.
23. The vendor will do preventive maintenance once in a quarter for up keep of the vendors end equipment. The schedule will have to be adhered to strictly by him.
24. Should have ISP Network &Internet Gateway Uptime of 99.5% or more and consistent Latency«50msec) from NDCC to ISPs tier1 peering point. Uptime shall be calculated as (Total Time - Down Time) X 100/Total Time. Violation of which will attract the deduction in payment bills raised by the ISP.

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25. The response time for attending the faults will be one hour (maximum) once reported to the Vendor. The Vendor will rectify the faults within 4 hours failing which; the vendor will arrange temporary replacements. A Managerfor the single point of contact, for any maintenance related activities to be identified for this agreement.
26. Vendor should provide the connectivity and Bandwidth as per the SLA

Service Level Agreement (SLA)

27. Maintenance support service (24 hours and 7 days a week) for Band width and equipment
28. The target value of the availability of the circuit (Link) should be 99.5%per month.
29. If the availability falls below 99.5%, Rebate should be provided on slab basis with maximum penalty in exponential from as given below :

Duration of service unavailability	Service level credit
Up to 45 minutes	No Credit
46 minutes - 4 hrs.	5% of MRC (Monthly Recurring Charges)
4 hrs. 1 min - 8 hrs.	10% of MRC
8 hrs. 1 min - 16 hrs.	15% of MRC
16 hrs. 1 min - 24 hrs.	20% of MRC
For each subsequent 24-hour period thereafter	Additional 3% of MRC

30. Bidders should meet the eligibility criteria by providing necessary documentary proof for substantiating compliance to these criteria. The terms which are not compliant with the said criteria will not be evaluated.
31. Initial Work Order will be placed on the vendor for a period of one year from the date of issue of work order. After one year of service period, if found satisfactory performance, the services may be extended by two more years, one year at a time.
32. Vendor has option to request end user for terminating the service contract with minimum of3months of notice period in advance
33. End user has right to terminate the contract anytime for any poor performance or the service related issues

5.2	**200 Mbps Leased line between NDCC, New Delhi and MHA, North Block, New Delhi:**	2

1. Supply, Installation, Commissioning and Configuration of TWO independent redundant point to point Leased Line connectivity links from different providers with bandwidth and necessary hardware (Cabling, Modems, Mux etc.,) as per the following table for a period of one year from the date of Installation and acceptance. Required Routers and Firewall will be provided by the end user.
   - Location : From NDCC, New Delhi – MHA, North Block, New

Delhi

- Type of circuit : Data line
- Bandwidth : 200 Mbps
- Type of Service : One time installation cost including cabling, modems, mux etc. in establishment of 200 Mbps leased line and Recurring cost/ Link subscription charges for providing 200 Mbps bandwidth for ONE year
- Port: Ethernet
- Service start : From the date of installation and acceptance

2. This tender is issued for supply, installation and commissioning of redundant TWO point to point leased lines of 200 Mbps bandwidth each between NDCC, New Delhi to North Block, New Delhi.
3. Scope of work is to provide two numbers of point to point leased line connectivity of 200 Mbps on uncompressed, unshared leased lines (1:1) including installation, commissioning, testing & up keep of the complete link for the service period of one year from the date of release of work order.
4. The bidder should have his own last mile fiber connectivity which will terminate at all the locations.
5. The bidder should provide the service built up on ring topology with Fibre connection including last mile Ethernet based solution and shall include the necessary end equipment.
6. Bidder should ensure the availability and reliability of the line through a similar redundant line which will be used in case of service failure.
7. The bidder should be a company registered in India and doing business in India with applicable ISO certification.
8. The bidder should provide official and valid references in respect of similar projects completed for the past 3 years with documentary proof.
9. The bidder should have his own Network Operations Centre (NOC).
10. The bidder should have service facilities with 24 hrs x 7 days technical Support by NOC
11. Minimum Bandwidth for up-link / Down-link shall not be below 95% of committed bandwidth.
12. The bidder should be in existence in the industry for the last 5 years.
13. The Vendor should produce the validity of TRAI license with documentary Proof and DoT license for operations in India
14. The end user reserves the right to distribute the bandwidth for its applications.
15. The connectivity will be through dedicated leased optical fiber line. The communication should be through dedicated fiber cores and not through MPLS network.
16. The Vendor will be responsible for comprehensive maintenance during the period of service contract or entire warranty period. Warranty

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period will start after acceptance of installation & testing of complete connectivity.

17. The vendor has to do preventive maintenance once in a quarter for upkeep of the vendors and equipment. The schedule will have to be adhered to strictly by the vendor
18. The response time for attending the faults will be one hour (maximum) once reported to the Vendor. The Vendor should rectify the faults within 4 hours failing which; the vendor has to arrange temporary replacements. A Manager for the single point of contact, for any maintenance related activities to be identified for this agreement.
19. Maintenance support service (24 hours and 7 days a week) for Bandwidth and equipment.
20. The target value of the availability of the circuit (Link) should be 99.5% per month.
21. If the availability falls below 99.5%, Rebate should be provided on slab basis with maximum penalty in exponential form as given below:

Duration of service unavailability	Service Level Credit
Up to 4 hours	No Credit
4 hrs 1 min - 8hrs.	2.5% of MRC(Monthly Recurring Charges)
8hrs 1 min - 16hrs.	5.0% of MRC
16hr 1 min – 24hrs.	7.5% of MRC
Beyond 24 hrs.	10.0% of MRC (Maximum)

22. Bidders should meet the eligibility criteria by providing necessary documentary proof for substantiating compliance to these criteria. The tenders which are not compliant with the said criteria will not be evaluated.
23. Initial Work Order will be placed on the vendor for a period of one year from the date of acceptance after establishment of the services as per the specifications. The service may be extended by one year at a time up to maximum of total 3 years based on satisfactory performance on mutual consent, with the same rate, terms and conditions.
24. Vendor should give a minimum of 3 months of advance notice period in any circumstances before terminating the service contract.
25. End user has right to terminate the contract for any poor performance or the service related issues.

5.3	**200 Mbps Leased line between NDCC, New Delhi and NRSC, Shadnagar near Hyderabad** 1. Supply, Installation, Commissioning and Configuration of TWO independent redundant point to point Leased Line connectivity links from two different vendors with bandwidth and necessary hardware (Cabling, Modems, Mux etc.,) as per the following table for a period of one year from the date of Installation and acceptance. Required	**2**

Routers and Firewall will be provided by the end user.

- Location : From NDCC, New Delhi – NRSC, Shadnagar (Shadnagar is located 30Kms from Hyderabad airport)
- Type of circuit : Data line
- Bandwidth : 200 Mbps
- Type of Service : One time installation cost including cabling, modems, mux etc. in establishment of 200 Mbps leased line and Recurring cost/ Link subscription charges for providing 200 Mbps bandwidth for ONE year
- Port: Ethernet
- Service start : From the date of installation

and acceptance

2. This tender is issued for supply, installation and commissioning of redundant **TWO** point to point leased lines of 200 Mbps bandwidth each between NDCC, New Delhi to NRSC, Shadnagar.
3. Scope of work is to provide two numbers of point to point leased line connectivity of 200 Mbps on uncompressed, unshared leased lines (1:1) including installation, commissioning, testing & up keep of the complete link for the service period of one year from the date of release of work order.
4. The bidder should have his own last mile fiber connectivity which will terminate at all the locations.
5. The bidder should provide the service built up on ring topology with Fibre connection including last mile Ethernet based solution and shall include the necessary end equipment.
6. Bidder should ensure the availability and reliability of the line through a similar redundant line which will be used in case of service failure.
7. The bidder should be a company registered in India and doing business in India with applicable ISO certification.
8. The bidder should provide official and valid references in respect of similar projects completed for the past 3 years with documentary proof.
9. The bidder should have his own Network Operations Centre (NOC).
10. The bidder should have service facilities with 24 hrs x 7 days technical Support by NOC
11. Minimum Bandwidth for up-link / Down-link shall not be below 95% of committed bandwidth.
12. The bidder should be in existence in the industry for the last 5 years.
13. The Vendor should produce the validity of TRAI license with documentary Proof and DoT license for operations in India
14. The end user reserves the right to distribute the bandwidth for its applications.
15. The connectivity will be through dedicated leased optical fiber line. The communication should be through dedicated fiber cores and not through MPLS network.

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16. The Vendor will be responsible for comprehensive maintenance during the period of service contract or entire warranty period. Warranty period will start after acceptance of installation & testing of complete connectivity.
17. The vendor has to do preventive maintenance once in a quarter for upkeep of the vendors end equipment. The schedule will have to be adhered to strictly by the vendor
18. The response time for attending the faults will be one hour (maximum) once reported to the Vendor. The Vendor should rectify the faults within 4 hours failing which; the vendor has to arrange temporary replacements. A Manager for the single point of contact, for any maintenance related activities to be identified for this agreement.
19. Maintenance support service (24 hours and 7 days a week) for Bandwidth and equipment.
20. The target value of the availability of the circuit (Link) should be 99.5% per month.
21. If the availability falls below 99.5%, Rebate should be provided on slab basis with maximum penalty in exponential form as given below:

Duration of service unavailability	Service Level Credit
Up to 4 hours	No Credit
4 hrs 1 min - 8hrs.	2.5% of MRC(Monthly R
8hrs 1 min - 16hrs.	5.0% of MRC
16hr 1 min – 24hrs.	7.5% of MRC
Beyond 24 hrs.	10.0% of MRC (Maximu

22. Bidders should meet the eligibility criteria by providing necessary documentary proof for substantiating compliance to these criteria. The tenders which are not compliant with the said criteria will not be evaluated.
23. Vendor should give a minimum of 3 months of advance notice period in any circumstances before terminating the service contract.
24. End user has right to terminate the contract for any poor performance or the service related issues.

Supply, installation, commissioning, testing and operationalization of following display devices as per the details given below.

Sl No	Generic name of the item with detailed specifications	Quantity
6	**Display devices** - High quality display devices as nerve centre for control rooms for visualization of various data formats enabling decision making.	
6.1	**Video walls-NDCC**	02
	Video walls for DM Control Room - 7(C) X 2 (R) – 1 No and IS Control Room - 6(C) X 2 (R) - 1 No. 1. The network-based control room solution should consist IP enabled DLP based Video wall cubes. They should be able to show signals over IP without the need of separate decoders. 2. Each of these Video wall cubes should be able to display up to 60 sources per display. 3. Each of these Video wall cubes should be able to display up to 60 sources per display. It should be possible to show any of the input sources or all of the input sources in any position on the wall, in any size and any configuration. 4. The system should support automatic format detection for plug and play simplicity. 5. Configuration: VIDEO WALL CUBES OF 60" DIAGONAL IN A **i) 7(C) X 2 (R) – 1 No** **ii) 6(C) X 2 (R) - 1 No** CONFIGURATION COMPLETE WITH BASE STAND. 6. Reputed Company: The OEM should be an established multinational in the field of video walls and should have at least 1000 DLP cube installations in India. 7. OEM Capability: Only those OEM's would be considered who also manufacture the Projection/Optical engine as well apart from the whole cube. Companies claiming to be OEM's but not manufacturing their own Projection/Optical engines shall not be considered 8. Native Resolution of each display cube: 4K. 9. Light Source Type: Laser light source 10. Light Source Type: Individual cube should be equipped with multiple laser banks and each laser bank should have an array of diodes. Single or multiple diode failure should not impact image display on the screen. 11. Brightness of Projection engine: Minimum 2200 lumens Brightness Uniformity: ≥ 95 % Engine should be protected from dust and should be IP6X certified by a third party laboratory. 12. Control: IP based control to be provided Remote: IR remote control should also be provided for quick access 13. Screen to Screen Gap: Upto .2 mm. Screen Support: Screen should be minimum 3 layers with a Hard	

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Backing to prevent bulging.

14. Control BD Input terminals: Input: 1 x Digital DVI. Input: 1 x HDMI, Input: 1 x Display Port, Input: 1 x analog Dsub-15.
15. Power Supply: Dual Redundant and Hot Swappable Power Supply. This should be built inside the cube for fail safe operation. Power supplies extended or kept outside the cube are not acceptable
16. Cooling Inside Cube: By Means of a sealed heat pipe. Hazadrous liquids should not be used inside the cooling system, (Bidder to declare the cooling system used inside the cooling system)
17. Cube Depth: Total Cube depth including screen module should be less than 500 mm or lower.
18. Protocol: System should support industry standard network protocols: DHCP, UDP, TCP /IP.
19. Cube Size: Each cube should have a screen size of 1328 mm wide and 747 mm high. The cube size can have a tolerance of ± 5% in size.
20. Critical component of Videowall cube (i.e. Projection engine) must follow Industry standard IEC / EN 60529 in designed to avoid the entry of dust to ensure longer life of system. System should be tested and certified by any 3rd party lab to confirm anti dust design.
21. ENCODER FOR RGB/DVI / HD SIGNAL – 14 Qty PER VW

Parameter	Desired Specification
Input	DVI-I Connector with HDCP support
Input Color Depth	Color Depth 8 bits per pixel
Input Channels	Channels 1
Output	HDMI 1.3 Support to loopback progressive VGA or HDMI input signal
Output Channels	Channels 1
Ethernet	Ethernet Gigabit 1000 BASE-T
Interface	2x RJ-45, Redundant LAN port
Protocols	Protocols DHCP, UDP,TCP/IP
IP Address	IP Address Static IP address, Automatic IP address
Power on Ethernet	Support POE
KVM	Support IP KVM function
MTBF	> 100,000 Hours
Supported Resolutions	Minimum Up to 1920x 1200 @ 60 Hz
Power Requirement	100-240 VAC
Operation Temperature	Minimum range 0-40 deg. C

22. ENCODER FOR 4K INPUT SIGNALS- 4 Qty. PER VW

Parameter	Desired Specification
Input	HDMI 2.0/ DP1.2 support up to 3840x 2160@

	60 Hz
Input Color Depth	Color Depth 8 /10bits per pixel
Input Channels	Channels 1
Ethernet	Ethernet Gigabit 1000 BASE-T
Interface	2x RJ-45, Redundant LAN port
Protocols	Protocols DHCP, UDP,TCP/IP
IP Address	IP Address Static IP address, Automatic IP address
Power on Ethernet	Support POE
KVM	Support IP KVM function
MTBF	> 100,000 Hours
Supported Resolutions	Minimum Up to 3840x 2160 @ 60 Hz
Power Requirement	100-240 VAC
Operation Temperature	Minimum range 0-40 deg. C

23. SERVER SPECIFICATIONS – 1 PER VW 1 PER VW - with optimal configuration with CPU, Memory, HDD, Network, OS etc.
24. Wall Management Software:
    - Wall management software should be based browser & Server based Architecture. User should be able to login the server with Internet Explorer. There should be no need to install any additional software on the control computer.
    - Should have function for static layout and automatic layout creation, editing, loading, and deleting. Any layout should be loaded in under 1 sec (irrespective of size of display & number of windows)
    - Software should able to manage multiple displays simultaneously including status monitoring, video window control and properties setup. Software should able to preview video signals before opening window on display wall
    - Operator should be able to preview the content of video/RGB signal by dragging the signal source into the signal preview window should be possible
    - The system software should support at least 5 RGB / Video signals preview at the same time.
    - Software should support multiple users managing a display wall or more display walls at the same time.
    - Video wall cube should be use Python- Django framework for monitoring the system
    - Should be able to control & monitor individual cube , multiple cubes and multiple video walls
    - Should provide a virtual remote on the screen to control the video wall

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- Input sources can be scheduled in " daily", "periodically" or "sequentially" mode per user convenience
- System should have a quick monitor area to access critical functions of the video wall
- User should be able to add or delete critical functions from quick monitor area
- Automatically launch alerts, warnings, error popup windows in case there is an error in the system
- User should be able to define the error messages as informational, serious or warning messages
- Automatically notify the error to the administrator or user through a pop up window and email
- Status log file should be downloadable in CSV format as per user convenience
- All the Layouts can be scheduled as per user convenience. Software should support auto launch of Layouts according to specified time event by user. It should be possible to create offline layouts
- Software should support user log file management
- It should support at least 60 signal sources displaying in one display unit simultaneously with freely scalable windows.
- The software GUI should be able to show the live view of all the sources on the browser
- System software should able to manage Videowall region into multiple regions as per user requirements.
- User should be able to see multiple signal source in one window with specified time interval and with user defined sequence.
- User should be able to control complete system through IPAD and Android system over Wi-Fi.

25. High definition video conferencing system and accessories-4 Sets

Features	Details
MAKE AND MODEL	Specify and include Brochures
Camera	
Image Device	1/2.8 Exmor CMOS
Effective Pixels	2 Mega Pixels or more
Resolution	Full HD1920x1080/30fps
Minimum illumination	1.8 lx or lesser
Optical Zoom	12 x or Better
Digital Zoom	12 x or Better
Focus	Auto / Manual
Pan Angle / Speed-	Pan : + 100° or higher
Tilt Angle / Speed	Tilt : + 25°
Horizontal Viewing Angle	70° (wide) or better
Other features	Back light compensation, Auto white balance, Auto Gain Control
Programmable Preset	16 positions minimum

Video Output	DVI-I or HDMI
HD Codec	
Resolution	Codec Should support up to 1080p 60fps video resolution to communicate more clearly and effectively
Dual Video Stream	VC system shall support to send dual HD 1080p video streams simultaneously (camera image and PC presentation) at a smooth 30fps in accordance with H.239 standards
Display Support	VC system shall support three video monitors in full size view thru HDMI or DVI-I. output to view Far end and Near end videos and PC Presentation separately
Viewing	Facility of viewing Far end, Near end and presentation- 3 images in one monitor should be available in case of using single monitor
Multi Conferencing facility	System should allow simultaneous connections up to 20 or more sites in H.323 Multi conferencing mode
HDCP Mode	In HD multi conferencing mode –system shall display all 6 sites participants in continuous-presence mode
Voice Activation	Continuous-presence voice activated switching should be available to display the active speaker on the largest sub screen or should be displayed the current speaker in the full screen mode
Network Support	System should support dual network interfaces to switch between office-base LAN and WAN connections to communicate within an intranet environment and over the public Internet. Multi-point connections facility between LAN and WAN environments also should be available.
Data Sharing	Should support PC images up to 1080p resolution for live data sharing System should have the facility to highlight the points or to add sketch notes on shared data presentations.
Recording	System should have the facility to record the VC sessions including HD video (720p), voice and PC presentations within the system or thru external means
Bit Rate Support	System should support video bit rate of 64kbps to 16,000 kbps on H.323 and 64kbps to 768kbps on H.320
Preferred Video Inputs	HDMI x 1, DVI-I x 2

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Preferred Video Outputs	HDMI x 2, DVI-I x 1
Preferred Audio Inputs	MIC/AUX x 2 , HDMI x 1, Analog Microphone x 6
Preferred Audio Outputs	HDMI x 1, Line Output x 1, REC Output x 1
Network Connection	Minimum 2 Nos 10Base –T/100 Base-Tx/1000Base-Tx , ISDN x 1
ITU-T Standards	H.231, H.241 H.242, H.243, H.245, H.350, H.460.18, H.460.19
Video Communication Protocol	H.261*2, H.263, H.263+, H.263++, H.264, H.264 High profile, MPEG-4 SP@L3
Video Resolution	4:3 QCIF (176 x 144), CIF (352 x 288), 4CIF (704 x 576) 16:9 wCIF/w288p (512 x 288), w432p (768 x 432), w4CIF(1024 x 576), 720p (1280 x 720), 1080p (1920 x 1080)
Video Frame rate :	H.261 QCIF 30 fps, CIF 30 fps, H.263 QCIF 30 fps, CIF 30 fps, 4CIF 30 fps H.264 QCIF 30 fps, CIF 30 fps, 4CIF 30 fps, wCIF 30 fps, w432p 30 fps, w4CIF 30 fps, 720p 60 fps, 1080p 60 fps
Audio bandwidth and coding	MPEG-4 AAC Stereo: 22 kHz at 192 kbps (IP only) MPEG-4 AAC Mono: 14 kHz at 48 kbps, 64 kbps, 96 kbps MPEG-4 AAC Mono: 22 kHz at 64 kbps, 96 kbps (IP only) G.711: 3.4 kHz at 56 kbps, 64 kbps G.722: 7.0 kHz at 48 kbps, 56 kbps, 64 kbps G.728: 3.4 kHz at 16 kbps
Network Features	Adaptive Forward Error Correction), Real-time Auto Repeat request, Adaptive Rate Control, IP Precedence, DiffServe, Packet reordering, TCP/UDP port setting, NAT, PPPoE, UDP shaping, Encryption, Auto gatekeeper discovery, UPnP, URI Dialing, IPv6
Far End Camera Control	H.224, H.281
Audio Features	Stereo echo canceling as standard feature, with Noise – cut and Automatic Gain control
Screen Display Modes	Full screen, Picture – in – Picture, Picture and Picture, PandPandP, Split screen etc.
Data Encryption Protocols	H.233, H.234, H.235 ver.3
Microphone	Minimum 2 Nos of omnidirectional Mic and facility to connect external micinputs .
Network Communication Protocol	ITU-T , H.323, IETF SIP
Supported Network	TCP/IP, UDP/IP, DHCP, DNS, HTTP,

Protocols	TELNET, SSH, SNMP, NTP, ARP, RTP/RTCP
Multi Camera Producer	Flexible Production Switcher with multiple video inputs
LCD Touch Screen	Smart touch LCD Screen
Other Features	Multi view Monitoring, Advanced Titles and Effects Record directly to SD Card , with required joystick controller

26. AUDIO SYSTEM , CONTROLLER , SWITCH ,RACK, CABLES AND CONNECTORS

- FOH Speakers: SITC of Flyable Compact 8" 2-way loudspeaker with rotatable horn. The speaker cabinet must have Freq. Response (-3 dB): 110 Hz - 146kHz, Freq. Range (-10 dB): 70 Hz - 20 kHz, sensitivity (1W/1m) 95 dB SPL or more, delivering Max SPL of 120 dB or more with power handling pk 700W or more. The speaker should have a nominal impedance of 8 ohm .The speaker cabinet should have a horizontal x vertical coverage angle of 90 x 50 degree or better - 8 nos.,
- DSP Amplifier : Supply of Class AB/D/H/I Dual channel DSP Inbuilt power amplifier with specification as below or BETTER to suit the power requirement of proposed Speakers; Maximum Output Power, Dual Channel:600W @ 4 ohms,800W @ 2 ohms,Max Bridged Output Power: 2000 W @ 4 ohms,Frequency Response:20Hz - 20 KHz,THD< 0.05%,Max input Level:+21dBu, Crosstalk<80dB, input impedence:20kohm,signal to noise ratio : >104 dB ,with built in protection such as Protection Audio limiters, high temperature, DC, HF, Back-EMF, Peak current limiters, Inrush current limiters, Turn on delay and with In Built DSP featuring FIR Filters, Audio Limiters, Output delay per channel, 31 band GEQ per channel, PEQ per channel, Load impedance or Better - 4 no
- 16 Channel Mixer : 16 channel Mixer with Digital Audio interface with 4 input channel & 4 output channels with AD/DA conversion 24-bit and; USB 2.0 PC Interface, MIDI interface, OLED display;100 Digital effects presets with at least 20 user preset available. 12 mono & 4 stereo channels, 6 auxillary outputs,11 band stereo equalizer;THD(at 1kHz)<0.005%,frequency response(-3dB) :20Hz to 65kHz;crosstalk>85dB,CMRR(at 1kHz)>80dB,Equivalent input noise:-130dBu A, maximum level mic inputs:+21dBu- 4 nos.
- Cordless Handheld Microphone : SITC of UHF Handheld Wireless Mic with Cardiod polar pattern,Dynamic microphone ,frequency response 80Hz-18kHz,RF sensitivity < 1.0 Uv,Image rejection>55dB,Dyanmic range >95dB and receiver having 30 or more channels possible,S/N ratio >100dB A,dynamic range >95db B,distortion<1 %,more than 12hrs battery life with AA battery.The transmitter & receiver should be of metal body - 8 nos.

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	• Wireless Lapel Microphone : SITC of UHF Wireless Mic Lapel with condensor,frequency response 100Hz-15kHz,Cardiod polar pattern,,RF sensitivity < 1.0 Uv,Image rejection>55dB,Dyanmic range >95dB and receiver having 30 channels possible,S/N ratio >100dB A,dynamic range >95db B,distortion<1 %,more than 12hrs battery life with AA battery.The transmitter & receiver should be of metal body - 4 nos. • Controller : Eight IR/serial, eight relay, and eight Versiport I/O ports , One RS-232/422/485 COM, Native BACnet™/IP support , High-speed USB 2.0 host port, Onboard 512MB RAM & 4GB Flash memory, Exclusive modular programming architecture. supports up to 10 simultaneously running programs . Ethernet: 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery,full/half duplex, industry-standard TCP/IP stack, UDP/IP, CIP, DHCP, SSL,TLS, SSH, SFTP (SSH File Transfer Protocol), FIPS 140-2 compliant encryption, IEEE 802.1X, SNMP, BACnet/IP, IPv4 or IPv6, Active Directory authentication, IIS v.6.0 Web Server, SMTP e-mail client. TLS, SSL, SSH, and SFTP network security protocols.IPv6 ready. Full Unicode (multi-language) support - 1 No • Wireless Touch Screen with wireless Gate Way : 9.5 " or higher LED backlit color LCD display or better, Multitouch Display with IPS Technology , 500 Nits Brightnerss - 4 No • Network Switch : 16 Ports Number of 10/100/1000BASE-TX ports, Link Status detection LED Shut-Off, Port Shut-Off , System Hibernation 4 SFP Ports, 40 GBps Switch Capacity, 29.8 Mbps 64-Byte Packet Forwarding Rate - 4 Nos • Cables & Connectors : Cables like Audio cable, Speaker cable, control cable etc and connectors like XLR, RJ-45, RCA, 9-pin Male, 9-pin Female, 3.5mm stereo connector etc required for proper operation of system - 1 Lot • Equipment Rack : Suitable equipment rack for housing all audio products and control products with etc space for housing other prodcuts like DA,Tx, etc., - 4 Nos • The bidder shall enclose tender specific OEM Authorization letter for Audio System , and Control system . Offers without OEM authorsiation letter will be summarily rejected. • The bidder is responsible for integrating the audio system , control system with existing Video Conferencing and Video System like displays , DAs, etc.,	
6.2	**Video walls -North block**	**02**
	Video walls for IS Control Room - 5(C) X 2 (R) – 1 No and IS Conference Hall - 5(C) X 2 (R) - 1 No. 1. The network-based control room solution should consist IP enabled DLP	

	based Video wall cubes. They should be able to show signals over IP without the need of separate decoders. 2. Each of these Video wall cubes should be able to display up to 60 sources per display. 3. Each of these Video wall cubes should be able to display up to 60 sources per display. It should be possible to show any of the input sources or all of the input sources in any position on the wall, in any size and any configuration. 4. The system should support automatic format detection for plug and play simplicity. 5. **Configuration**: VIDEO WALL CUBES OF 60" DIAGONAL IN A 5(C) X 2 (R) – 1=2 Nos CONFIGURATION COMPLETE WITH BASE STAND. 6. Reputed Company: The OEM should be an established multinational in the field of video walls and should have at least 1000 DLP cube installations in India. 7. OEM Capability: Only those OEM's would be considered who also manufacture the Projection/Optical engine as well apart from the whole cube. Companies claiming to be OEM's but not manufacturing their own Projection/Optical engines shall not be considered Native Resolution of each display cube: 4K. 8. Light Source Type: Laser light source 9. Light Source Type: Individual cube should be equipped with multiple laser banks and each laser bank should have an array of diodes. Single or multiple diode failure should not impact image display on the screen. 10. Brightness of Projection engine: Minimum 2200 lumens Brightness Uniformity: ≥ 95 % Engine should be protected from dust and should be IP6X certified by a third party laboratory. 11. Control: IP based control to be provided Remote: IR remote control should also be provided for quick access 12. Screen to Screen Gap: Upto .2 mm. Screen Support: Screen should be minimum 3 layers with a Hard Backing to prevent bulging. Control BD Input terminals: Input: 1 x Digital DVI, Input: 1 x HDMI, Input: 1 x Display Port, Input: 1 x analog Dsub-15. 13. Power Supply: Dual Redundant and Hot Swappable Power Supply. This should be built inside the cube for fail safe operation. Power supplies extended or kept outside the cube are not acceptable Cooling Inside Cube: By Means of a sealed heat pipe. Hazadrous liquids should not be used inside the cooling system, (Bidder to declare the cooling system used inside the cooling system) 14. Cube Depth: Total Cube depth including screen module should be less than 500 mm or lower. 15. Protocol: System should support industry standard network protocols:	

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DHCP, UDP, TCP /IP.

16. Cube Size: Each cube should have a screen size of 1328 mm wide and 747 mm high. The cube size can have a tolerance of ± 5% in size.
17. Critical component of Videowall cube (i.e. Projection engine) must follow Industry standard IEC / EN 60529 in designed to avoid the entry of dust to ensure longer life of system. System should be tested and certified by any 3rd party lab to confirm anti dust design.
18. ENCODER FOR RGB/DVI / HD SIGNAL – 10 Qty PER VW

Parameter	Desired Specification
Input	DVI-I Connector with HDCP support
Input Color Depth	Color Depth 8 bits per pixel
Input Channels	Channels 1
Output	HDMI 1.3 Support to loopback progressive VGA or HDMI input signal
Output Channels	Channels 1
Ethernet	Ethernet Gigabit 1000 BASE-T
Interface	2x RJ-45, Redundant LAN port
Protocols	Protocols DHCP, UDP,TCP/IP
IP Address	IP Address Static IP address, Automatic IP address
Power on Ethernet	Support POE
KVM	Support IP KVM function
MTBF	> 100,000 Hours
Supported Resolutions	Minimum Up to 1920x 1200 @ 60 Hz
Power Requirement	100-240 VAC
Operation Temperature	Minimum range 0-40 deg. C

19. ENCODER FOR 4K INPUT SIGNALS- 4 Qty. PER VW

Parameter	Desired Specification
Input	HDMI 2.0/ DP1.2 support up to 3840x 2160@ 60 Hz
Input Color Depth	Color Depth 8 /10bits per pixel
Input Channels	Channels 1
Ethernet	Ethernet Gigabit 1000 BASE-T
Interface	2x RJ-45, Redundant LAN port
Protocols	Protocols DHCP, UDP,TCP/IP
IP Address	IP Address Static IP address, Automatic IP

	address
Power on Ethernet	Support POE
KVM	Support IP KVM function
MTBF	> 100,000 Hours
Supported Resolutions	Minimum Up to 3840x 2160 @ 60 Hz
Power Requirement	100-240 VAC
Operation Temperature	Minimum range 0-40 deg. C

20. SERVER SPECIFICATIONS – 1 PER VW - with optimal configuration with CPU, Memory, HDD, Network, OS etc.
21. Wall Management Software:
    - Wall management software should be based browser & Server based Architecture. User should be able to login the server with Internet Explorer. There should be no need to install any additional software on the control computer.
    - Should have function for static layout and automatic layout creation, editing, loading, and deleting. Any layout should be loaded in under 1 sec (irrespective of size of display & number of windows)
    - Software should able to manage multiple displays simultaneously including status monitoring, video window control and properties setup. Software should able to preview video signals before opening window on display wall
    - Operator should be able to preview the content of video/RGB signal by dragging the signal source into the signal preview window should be possible
    - The system software should support at least 5 RGB / Video signals preview at the same time.
    - Software should support multiple users managing a display wall or more display walls at the same time.
    - Videowall cube should be use Python- Django framework for monitoring the system
    - Should be able to control & monitor individual cube , multiple cubes and multiple video walls
    - Should provide a virtual remote on the screen to control the videowall
    - Input sources can be scheduled in " daily", "periodically" or "sequentially" mode per user convenience
    - System should have a quick monitor area to access critical functions of the videowall
    - User should be able to add or delete critical functions from quick monitor area

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- Automatically launch alerts, warnings, error popup windows in case there is an error in the system
- User should be able to define the error messages as informational, serious or warning messages
- Automatically notify the error to the administrator or user through a pop up window and email
- Status log file should be downloadable in CSV format as per user convenience
- All the Layouts can be scheduled as per user convenience. Software should support auto launch of Layouts according to specified time event by user. It should be possible to create offline layouts
- Software should support user log file management
- It should support at least 60 signal sources displaying in one display unit simultaneously with freely scalable windows.
- The software GUI should be able to show the live view of all the sources on the browser
- System software should able to manage Videowall region into multiple regions as per user requirements.
- User should be able to see multiple signal source in one window with specified time interval and with user defined sequence.
- User should be able to control complete system through IPAD and Android system over Wi-Fi

22. High definition video conferencing system and accessories

Features	Details
MAKE AND MODEL	Specify and include Brochures
Camera	
Image Device	1/2.8 Exmor CMOS
Effective Pixels	2 Mega Pixels or more
Resolution	Full HD1920x1080/30fps
Minimum illumination	1.8 lx or lesser
Optical Zoom	12 x or Better
Digital Zoom	12 x or Better
Focus	Auto / Manual
Pan Angle / Speed-	Pan : + 100° or higher
Tilt Angle / Speed	Tilt : + 25°
Horizontal Viewing Angle	70° (wide) or better
Other features	Back light compensation, Auto white balance, Auto Gain Control
Programmable Preset	16 positions minimum
Video Output	DVI-I or HDMI
HD Codec	
Resolution	Codec Should support up to 1080p 60fps video resolution to communicate more clearly and effectively
Dual Video Stream	VC system shall support to send dual HD

			1080p video streams simultaneously (camera image and PC presentation) at a smooth 30fps in accordance with H.239 standards		
		Display Support	VC system shall support three video monitors in full size view thru HDMI orDVI-I. output to view Far end and Near end videos and PC Presentation separately		
		Viewing	Facility of viewing Far end, Near end and presentation- 3 images in one monitor should be available in case of using single monitor		
		Multi Conferencing facility	System should allow simultaneous connections up to 20 or more sites in H.323 Multi conferencing mode		
		HDCP Mode	In HD multi conferencing mode –system shall display all 6 sites participants in continuous-presence mode		
		Voice Activation	Continuous-presence voice activated switching should be available to display the active speaker on the largest sub screen or should be displayed the current speaker in the full screen mode		
		Network Support	System should support dual network interfaces to switch between office-base LAN and WAN connections to communicate within an intranet environment and over the public Internet. Multi-point connections facility between LAN and WAN environments also should be available.		
		Data Sharing	Should support PC images up to 1080p resolution for live data sharing System should have the facility to highlight the points or to add sketch notes on shared data presentations.		
		Recording	System should have the facility to record the VC sessions including HD video (720p), voice and PC presentations within the system or thru external means		
		Bit Rate Support	System should support video bit rate of 64kbps to 16,000 kbps on H.323 and 64kbps to 768kbps on H.320		
		Preferred Video Inputs	HDMI x 1, DVI-I x 2		
		Preferred Video Outputs	HDMI x 2, DVI-I x 1		
		Preferred Audio Inputs	MIC/AUX x 2 , HDMI x 1, Analog Microphone x 6		
		Preferred Audio Outputs	HDMI x 1, Line Output x 1, REC Output x 1		

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Network Connection	Minimum 2 Nos 10Base –T/100 Base-Tx/1000Base-Tx , ISDN x 1
ITU-T Standards	H.231, H.241 H.242, H.243, H.245, H.350, H.460.18, H.460.19
Video Communication Protocol	H.261*2, H.263, H.263+, H.263++, H.264. H.264 High profile, MPEG-4 SP@L3
Video Resolution	4:3 QCIF (176 x 144), CIF (352 x 288), 4CIF (704 x 576) 16:9 wCIF/w288p (512 x 288), w432p (768 x 432), w4CIF(1024 x 576), 720p (1280 x 720), 1080p (1920 x 1080)
Video Frame rate :	H.261 QCIF 30 fps, CIF 30 fps, H.263 QCIF 30 fps, CIF 30 fps, 4CIF 30 fps H.264 QCIF 30 fps, CIF 30 fps, 4CIF 30 fps, wCIF 30 fps, w432p 30 fps, w4CIF 30 fps, 720p 60 fps, 1080p 60 fps
Audio bandwidth and coding	MPEG-4 AAC Stereo: 22 kHz at 192 kbps (IP only) MPEG-4 AAC Mono: 14 kHz at 48 kbps, 64 kbps, 96 kbps MPEG-4 AAC Mono: 22 kHz at 64 kbps, 96 kbps (IP only) G.711: 3.4 kHz at 56 kbps, 64 kbps G.722: 7.0 kHz at 48 kbps, 56 kbps, 64 kbps G.728: 3.4 kHz at 16 kbps
Network Features	Adaptive Forward Error Correction), Real-time Auto Repeat request, Adaptive Rate Control, IP Precedence, DiffServe, Packet reordering, TCP/UDP port setting, NAT, PPPoE, UDP shaping, Encryption, Auto gatekeeper discovery, UPnP, URI Dialing, IPv6
Far End Camera Control	H.224, H.281
Audio Features	Stereo echo canceling as standard feature, with Noise – cut and Automatic Gain control
Screen Display Modes	Full screen, Picture – in – Picture, Picture and Picture, PandPandP, Split screen etc.
Data Encryption Protocols	H.233, H.234, H.235 ver.3
Microphone	Minimum 2 Nos of omnidirectional Mic and facility to connect external mic inputs
Network Communication Protocol	ITU-T , H.323, IETF SIP
Supported Network Protocols	TCP/IP, UDP/IP, DHCP, DNS, HTTP, TELNET, SSH, SNMP, NTP, ARP, RTP/RTCP
Multi Camera Producer	Flexible Production Switcher with multiple

	video inputs
LCD Touch Screen	Smart touch LCD Screen
Other Features	Multi view Monitoring, Advanced Titles and Effects Record directly to SD Card , with required joystick controller

23. AUDIO SYSTEM , CONTROLLER , SWITCH ,RACK, CABLES AND CONNECTORS

- FOH Speakers: SITC of Flyable Compact 8" 2-way loudspeaker with rotatable horn. The speaker cabinet must have Freq. Response (-3 dB): 110 Hz - 146kHz, Freq. Range (-10 dB): 70 Hz - 20 kHz, sensitivity (1W/1m) 95 dB SPL or more, delivering Max SPL of 120 dB or more with power handling pk 700W or more. The speaker should have a nominal impedance of 8 ohm .The speaker cabinet should have a horizontal x vertical coverage angle of 90 x 50 degree or better - 8 nos.,
- DSP Amplifier : Supply of Class AB/D/H/I Dual channel DSP Inbuilt power amplifier with specification as below or BETTER to suit the power requirement of proposed Speakers; Maximum Output Power, Dual Channel:600W @ 4 ohms,800W @ 2 ohms,Max Bridged Output Power: 2000 W @ 4 ohms,Frequency Response:20Hz - 20 KHz,THD< 0.05%,Max input Level:+21dBu, Crosstalk<80dB, input impedence:20kohm,signal to noise ratio : >104 dB ,with built in protection such as Protection Audio limiters, high temperature, DC, HF, Back-EMF, Peak current limiters, Inrush current limiters, Turn on delay and with In Built DSP featuring FIR Filters, Audio Limiters, Output delay per channel, 31 band GEQ per channel, PEQ per channel, Load impedance or Better - 4 no.
- 16 Channel Mixer : 16 channel Mixer with Digital Audio interface with 4 input channel & 4 output channels with AD/DA conversion 24-bit and; USB 2.0 PC Interface, MIDI interface, OLED display;100 Digital effects presets with at least 20 user preset available. 12 mono & 4 stereo channels, 6 auxillary outputs,11 band stereo equalizer;THD(at 1kHz)<0.005%,frequency response(-3dB) :20Hz to 65kHz;crosstalk>85dB,CMRR(at 1kHz)>80dB,Equivalent input noise:-130dBu A, maximum level mic inputs:+21dBu - 4 nos.
- Cordless Handheld Microphone : SITC of UHF Handheld Wireless Mic with Cardiod polar pattern,Dynamic microphone ,frequency response 80Hz-18kHz,RF sensitivity < 1.0 Uv,Image rejection>55dB,Dyanmic range >95dB and receiver having 30 or more channels possible,S/N ratio >100dB A,dynamic range >95db B,distortion<1 %,more than 12hrs battery life with AA battery.The transmitter & receiver should be of metal body - 8 nos.
- Wireless Lapel Microphone : SITC of UHF Wireless Mic Lapel with condensor,frequency response 100Hz-15kHz,Cardiod polar

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	pattern,,RF sensitivity < 1.0 Uv,Image rejection>55dB,Dyanmic range >95dB and receiver having 30 channels possible,S/N ratio >100dB A,dynamic range >95db B,distortion<1 %,more than 12hrs battery life with AA battery.The transmitter & receiver should be of metal body - 4 nos. • Controller : Eight IR/serial, eight relay, and eight Versiport I/O ports , One RS-232/422/485 COM, Native BACnet™/IP support , High-speed USB 2.0 host port, Onboard 512MB RAM & 4GB Flash memory, Exclusive modular programming architecture. supports up to 10 simultaneously running programs . Ethernet: 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery.full/half duplex, industry-standard TCP/IP stack. UDP/IP, CIP, DHCP, SSL,TLS, SSH, SFTP (SSH File Transfer Protocol), FIPS 140-2 compliant encryption, IEEE 802.1X, SNMP, BACnet/IP, IPv4 or IPv6, Active Directory authentication, IIS v.6.0 Web Server, SMTP e-mail client. TLS, SSL, SSH, and SFTP network security protocols.IPv6 ready. Full Unicode (multi-language) support - 1 No • Wireless Touch Screen with wireless Gate Way : 9.5 " or higher LED backlit color LCD display or better, Muttitouch Display with IPS Technology , 500 Nits Brightnerss - 4 No • Network Switch : 16 Ports Number of 10/100/1000BASE-TX ports, Link Status detection LED Shut-Off, Port Shut-Off , System Hibernation 4 SFP Ports, 40 GBps Switch Capacity, 29.8 Mbps 64-Byte Packet Forwarding Rate - 4 Nos • Cables & Connectors : Cables like Audio cable, Speaker cable, control cable etc and connectors like XLR, RJ-45, RCA, 9-pin Male, 9-pin Female, 3.5mm stereo connector etc required for proper operation of system - 1 Lot • Equipment Rack : Suitable equipment rack for housing all audio products and control products with etc space for housing other prodcuts like DA,Tx, etc., - 4 Nos • The bidder shall enclose tender specific OEM Authorization letter for Audio System , and Control system . Offers without OEM authorsiation letter will be summarily rejected. • Thebidder is responsible for integrating the audio system , control system with existing Video Conferencing and Video System like displays , DAs, etc.,	
6.3	**Television**	**05**

	Type -4K UHD TV, Screen Type-Flat, Backlighting- Slim FLED (Direct) 1. Screen Size-70,Resolution-3840 x 2160,Motion Rate-MR 120 2. Color (Quantum Dot/Active Crystal/PurColor)- PurColor HDR (High-Dynamic Range)-HDR Premium 3. Dolby-Dolby Digital Plus, DTS Premium Sound-DTS Premium Sound 5.1,Sound Output (RMS)-20W, Speaker Type-Down Firing w/Bass Reflex (2 CH), Multi room Link-Yes, TV, Sound Connect-Yes, Bluetooth Headset Support 4. HDMI, USB, Ethernet, Composite In (AV), RF In (Terrestrial/Cable Input), Digital Audio Out (Optical), Audio Return Channel Support (via HDMI port)		
6.4	**Video conference system**		**03**
	1. Image Device: 1/2.8Exmor CMOS, Effective Pixels 2 Mega Pixels or more, Resolution Full HD1920x1080/30fps Minimum illumination 1.8 lx or lesser, Optical Zoom 12 x or Better, Digital Zoom 12 x or Better, Focus Auto / Manual Pan Angle / Speed Pan : + or - 100° or higher, Tilt Angle / Speed Tilt : + or – 25°, Horizontal Viewing Angle 70° (wide) or better, Other features Back light compensation, Auto white balance, Auto Gain Control, Programmable Preset 16 positions minimum, Video Output DVI - I or HDMI 2. Codec Should support up to 1080p 60fps video resolution to communicate more clearly and effectively 3. VC system shall support to send dual HD 1080p video streams simultaneously (camera image and PC presentation) at a smooth 30fps in accordance with H.239 standards end videos and PC Presentation separately		
6.5	**Projector system**		**02**
	Type of display	Poly-silicon TFT active matrix	
	Resolution	BrightLink 480i: 1024 × 768 pixels (XGA) BrightLink 475Wi/485Wi: 1280 × 800 pixels (WXGA)	
	Lens	F= 1.80 Focal length: 3.71 mm	
	Color reproduction	Full color, 16.77 million colors	
	Brightness	BrightLink 475Wi: Normal Power Consumption mode: White light output 2600 lumens (ISO 21118 standard) Color light output 2600 lumens ECO Power Consumption mode: White light output 1800 lumens (ISO	

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		21118 standard)
		BrightLink 480i: Normal Power Consumption mode: White light output 3000 lumens (ISO 21118 standard) Color light output 3000 lumens ECO Power Consumption mode: White light output 1800 lumens (ISO 21118 standard)
		BrightLink 485Wi: Normal Power Consumption mode: White light output 3100 lumens (ISO 21118 standard) Color light output 3100 lumens ECO Power Consumption mode: White light output 1800 lumens (ISO 21118 standard)
	Contrast ratio	3000 to 1 with Auto Iris on and Normal Power Consumption mode
	Image size	BrightLink 480i: 55.9 to 93.2 inches (1.42 to 2.37 m) BrightLink 475Wi/485Wi: 60 to 100 inches (1.52 to 2.54 m)
	Projection distance	13.7 to 23.5 inches (0.35 to 0.60 m)
	Projection methods	Front, wall or ceiling-mounted
	Optical aspect ratio (width-to-height)	BrightLink 480i: 4:3 BrightLink 475Wi/485Wi: 16:10
	Focus adjustment	Manual
	Zoom adjustment	Digital
	Zoom ratio (Tele-to-Wide)	1:1.35
	Internal sound system	16 W monaural
	Noise level	35 dB (Normal Power Consumption mode) 28 dB (ECO Power Consumption mode)
	Keystone correction angle	Vertical: ± 5° Horizontal: ± 5°

<table>
<tr><td></td><td>USB-B port compatibility</td><td>USB 1.1 and 2.0 compliant for USB display or external mouse</td><td></td></tr>
<tr><td></td><td>USB-A port compatibility</td><td>One USB 1.1 and 2.0 compliant port for USB device input or EPSON document camera display</td><td></td></tr>
<tr><td>6.6</td><td colspan="2">Big Display Systems (optional)</td><td>02</td></tr>
<tr><td></td><td colspan="2">1. UltraHD 4K 98" interactive large format touch display with simple to use wireless presentation and collaboration solution:
• Ultra HD 4K (3,840 x 2,160) resolutions for outstanding details and stunning visuals
• Large 98" backlit IPS Panel with wide 178o/178oviewing from just about any angle
• LED backlit technology for bright picture, longer life (minimum of 30,000 hours) and lower energy consumption
• High contrast ratio and fast response time deliverables crisp, readable content
• Interactive functionality with up to a10-point finger touch capabilities (5-point writing, 10-pointtouch) for annotation, drawing and pinch-in/-out and rotate gestures
• Simple wireless displayand true fast collaboration solution thanks to 802.11n/ac dual-band 2.4/5GHz support*
• Mirroring for iOS Airplay®, Android™ Miracast, Windows® PC, Apple®macOS™, Google Chromebook™ –OS independent*
• Voting and polling functions(Optional)*
• Remote manager with IT management software with automatic discovery and configuration*
• Full suite of display connections including HDMI-In/Out, AV-In, and VGA-In/Out
• Total 20W ofstereo sound power (10W x 2) with multiple audio-in and audio-out ports
2. Display
<table><tr><td>Type/Technology</td><td>Backlit LED -IPS Panel</td></tr><tr><td>Panel Size</td><td>98"</td></tr><tr><td>Brightness (Typ/Min)</td><td>440cd/m2/400cd/2</td></tr><tr><td>Contrast Ratio (Typ)</td><td>1,300:1</td></tr><tr><td>Native Resolution</td><td>4K Ultra-HD (3840x 2160)</td></tr><tr><td>Viewing Angle (H/V)</td><td>178o/178o</td></tr><tr><td>Aspect Ratio</td><td>16:9</td></tr><tr><td>Response Time (MS)</td><td>5ms (Typ)</td></tr><tr><td>Refresh Rate (Hz)</td><td>120Hz</td></tr><tr><td>Estimated Life Time (Typ)</td><td>30,000 hours (Min)</td></tr><tr><td>Display Color (Bit)</td><td>1.06 billion (10-bit)</td></tr></table>3. Interactivity</td><td></td></tr>
</table>

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Technology	Infrared Touch
Touch Points	Writing 5Points
Touch	10 Points
Accuracy	+2mm
Response Time	<20ms
Touch Resolution	32,767 x 32,767
Surface Protection	4mm Thick Toughened Glass (Level 7H on Mohs Scale of Mineral Hardness)
Touch Tools	Finger, Stylus, Glove, Opaque Objects

4. Operating System

System Version	Android™ v4.2.1
CPU	ARM®Cortex®A9 Dual Core CPU
GPU	Quad Core GPU
RAM	1.5G RAM
Internal Storage	8GB

5. Connectivity

Input Display	HDMI v1.4 (x1), HDMI v1.3 (x3), AV-In (x1), VGA-In (x3)
Audio	Audio-In (x3)
Output Display	VGA-Out(x1)
Audio	Audio-Out (3.5mm (x1)), Coaxial-Out (RCA) (x1)
Internet	LAN (RJ45)(x1)
Control	RS232 (x1)
USB Front	USB 2.0 (x3)
Sid	USB 2.0 (x1), USB 3.0 (x1), USB Type B (x2)(For Touch Port)

6. Expansion

Windows PC Module	Optional (48pin)

7. Audio

Speakers: 10W (x2) (Stereo

8. Power

Power Supply (Internal)	AC 100-240V, 50/60Hz
Consumption	650W
Standby Mode	<0.5W (Standby)

9. Physical characterstics

Dimension (L x H x D) IFPD	2,257 x 1,335 x 110mm (88.8" x 52.6" x 4.3")
W/Handles	2,257 x 1,335 x 121mm (88.8" x 52.6" x 4.8")
Weight	150kg (331lbs)

	VESA Mounting (FPMPMI)	4 -M8 × 25mm, 800 x 600mm (31.5 x 23.6")		
	Color	Black		
	10. Accessories			
	Standard	AC Power Cord, VGA Cable, USB Cable, Audio Cable, Stylus (x3),Remote Control, Wall Mount Kit, Documentation Kit		
	Optional	LauncherPlus, Interactive Smart Pen		

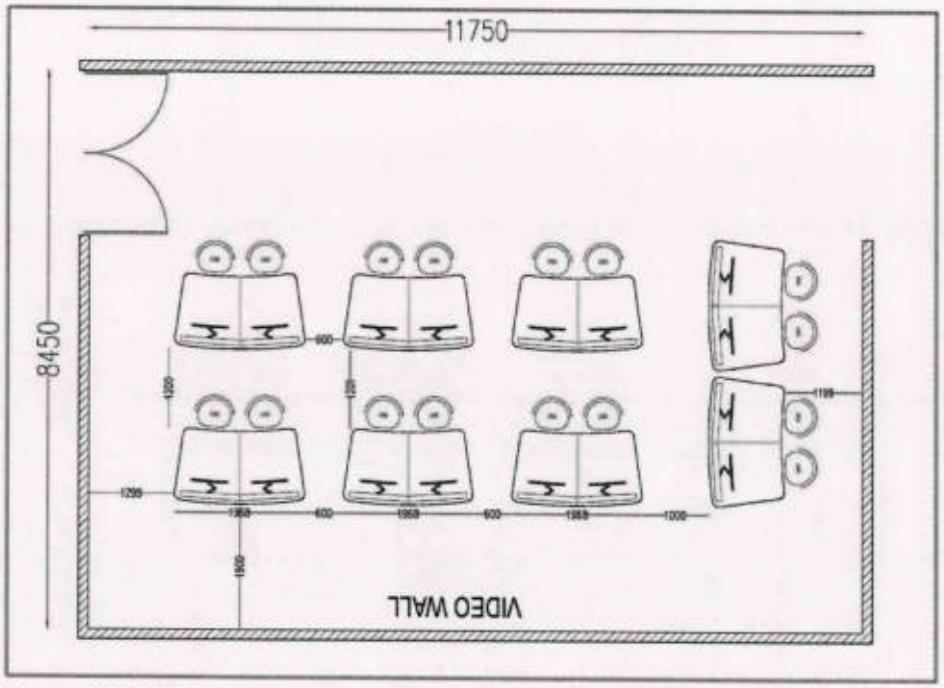

Figure 14. DM Control Room. Dimensions - (8.45x11.75 in Meters)

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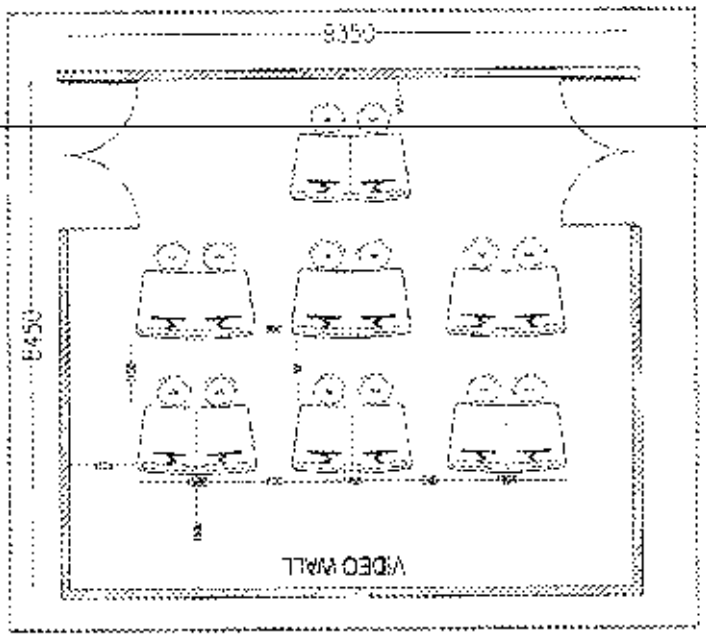

Figure 15. IS Control Room -. Room Dimensions - (8.45x9.35 in Meters)

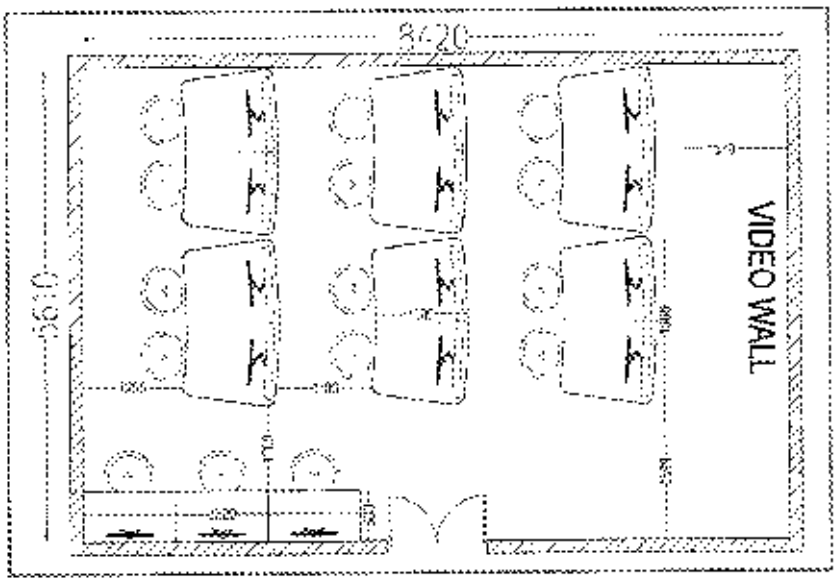

Figure 16.- IS Control Room at North Block, MHA

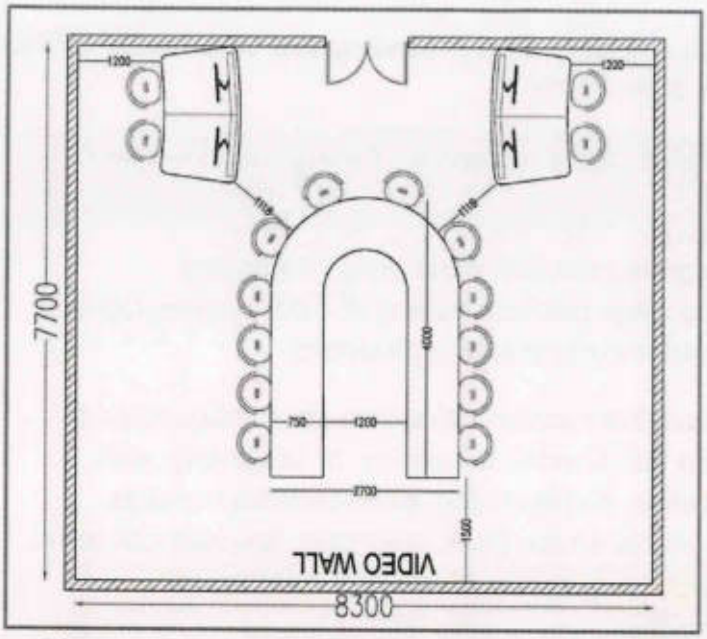

Figure 17. IS Conference Hall at North Block, MHA

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7. Supply, Installation and integration of handing over of following I.P PBX and Contact Centre as per details given below.

7.1	**IP PBX and Contact Centre - Emergency Helpline System**	**01 No**

General

1. The integrated solution must provide a unified communication platform having IP PBX system, Contact Centre infrastructure and applications
2. Must have the functionalities to support inbound and outbound PSTN voice telephony, IP telephony, web collaboration, conferencing, multi-channel contacts routing (voice, email, SMS, web chat, fax, web call back, etc.), desktop agents, supervisors, call recording, reporting, etc
3. Must have tight integration with IVR application, Conversation Bot, automated outbound applications. It must have proven integration with industry standard Computer Aided Dispatch (CAD) system
4. Similar solution must have been implemented and currently operational in at least 3 locations in India
5. The OEMs must have technical support offices and spares depot in India

IP PBX

6. The IP PBX system should be modular, expandable, embedded appliance or server based. The system shall have hot standby/ active-active/ redundant arrangement so that it should continue to operate in case of failure or maintenance of main processor or power supply or interfacing card or CPU etc.
7. The system should support PSTN voice landlines, IP, SIP, TDM, ISDN PRI, analog trunks, H.323 trunk, SIP trunk, etc. and compatible with all telecom interfaces / providers

	8. Should be supplied with initial minimum 2 PRI, 3 SIP and 10 PSTN external interfaces and 50 internal connections 9. Conference bridge that can manage multiple calls (5 or more simultaneous conferees) 10. Support for ACD (Automatic Call Distribution) Call Centre with CTI (Computer Telephony Integration) and advanced call routing 11. SIP over MPLS/ leased lines 12. The system shall provide all standard features: Basic call setup, name and number support, diversion (call forwarding) with reroute, call transfer, conference, speed dial, silence suppression, comfort noise and voice activity detection 13. The system should have IP address and connected to the network 14. The system shall have inbuilt web- based software for administration and maintenance of the system. 15. The system must support log services for both Internal and External commands and configuration history for at least 30 days 16. It should provide reports about station alarms, trunk analysis, processor occupancy, system capacity etc. *Contact Centre* 17. Contact Centre must be proposed for 20 Agents and 5 Supervisors. It should be incrementally scalable to more than hundred agents 18. All components must be deployed in local high availability including power supplies 19. Contact Centre solution must have previously proven tight integration & deployments with Computer aided Dispatch (CAD), CRM and GIS providers in India for	

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seamless interoperability

20. The system should offer comprehensive Automatic Call Distribution (ACD) features

21. It should support skill based routing using various algorithms including those based on dialled number, calling number, based on IVR, idle state, etc.

22. Must offer web based application for sharing data (images, video) and location by caller to agents

23. Should support IP based Softphone

24. Call Back request feature should be integral part of the offered contact centre platform

25. Must offer application for rapid notification system - mass broadcast on SMS, email, voice channels

26. Must offer ready reports and design of custom reports

Agent Desktop Features

27. Platform should have unified Agent desktop for all Inbound Voice, Multimedia and Outbound Agents

28. All voice and multimedia contacts must be handled similarly and routed to agent based on agent skillset

29. System should support multiplicity feature which allows an agent to handle multiple concurrent multimedia contacts.

30. Platform must offer visual designer tool to define flows for contact routing

31. Agent Desktop should have Call Control capabilities with built in soft phone feature

32. Soft Phone feature should be given for all agents and supervisors (20 agents, 5 supervisors)

33. Agent Desktop Voice related features: Accept and decline incoming contacts (phone, email), call hold/

	release, call transfer, conference call, observe/ barge-in, raise alert to supervisor, enter DTMF digits, call using Phonebook, send email reply, add attachment, add inline images, forward/ transfer email, handling of chat, call back request directly 34. Supervisor should be able to view and manage their live skill related statistics, display the number of agents available and not ready, display the maximum time customer has to wait before being connected to an agent, display the number of calls waiting, provide alerts for skillsets, whose service level falls below the threshold defined, change agent status from ready to not ready and vice- versa *IVR Features* 35. Interactive Voice Response (IVR) should be tightly integrated with the contact center solution 36. IVR platform must support VXML and CCXML protocols standards and should provide GUI based development environment for Voice XML and CCXML speech applications 37. IVR VXML application should be able collect and provide UUI data to ACD Platform and agent desktop application 38. Agent should be able to send client back to any specific IVR node 39. IVR VXML application should be able to collect digits entered by callers 40. IVR should support tight integration with industry leading ASR and TTS applications whenever needed in near future *Recording features* 41. The offered solution must provide 100% voice stream recording of all inbound and outbound calls with 90 days	

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storage

42. It should be capable of storing all recording in secure/ encrypted format

43. System must have the functionality to record screen/ data transactions associated with inbound and outbound calls for all or selected agents

44. System must have the functionality to enable live monitoring of voice

45. System must allow remote playback via internet browser and Windows Media Player

46. System must have the functionality to archive and search according to a variety of parameters

47. System must have the functionality to automatically transfer archived files to offline media according to established schedules or thresholds

48. System must have the functionality to search offline media for archived files

49. Storage should be compatible with customer provide SAN/NAS or other standards based storage. Storage capacity should be based on customer provided storage, and should not be licensed by supplier

50. System must integrate with customer provided data storage

51. The recording system's standard reporting package must include robust reports, including text and graphical charts, by various parameters - agent, supervisor, date range, call type, client type, inbound/ outbound, trend reports, etc.

52. Report customization and development must be available

53. Reports must be available for export in multiple formats

	to include pdf, xls, csv and html 54. System must have functionality to authenticate users via Active Directory, password authentication, AES-256 encryption, key management system, role based access controls, logging, auditing, etc. *Email routing* 55. The platform should support direct integration with IMAP/ POP3 email servers without additional gateways 56. Email should be routed to agent based on following options: email sender, particular words and phrases, content in email subject and body, time of receipt 57. System should have capability to view real-time traffic reports for email messages *Outbound features* 58. Platform must have an integrated Outbound functionality 59. Should support progressive, preview dialing, route calls to most appropriate resource, defined agent scripts, scheduling and priority *SMS routing features* 60. The platform should support integration with SMS Gateways over Web. It should also support SMS over SMTP without any external gateway 61. It should be possible to parse the SMS contact number for agent to give a call back to the SMS sender or revert with a SMS 62. It should be possible to configure SMS reply address settings *Chat features* 63. Solution should offer chat support features as an additional interaction channel to citizens 64. It should provide conversational bot capabilities for 24x7 citizen support with configuration of widgets for different	

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services as per need

65. It should support Machine Learning (ML) for continuous leaning and better accuracy

66. Conversation logs, audit trail, historical reports, escalation to live agents, services automation through API integration

Social media features

67. Support for additional interactivity to reach out through Facebook ,Twitter social media channels with responsive customer and agent interface

68. Real time sentiment analysis of tweets based on keywords and hashtags

69. Comprehensive real time and historical reports

Reporting features

70. Platform should have integrated real time and historical reporting with browser based administration

71. Common statistics related to agent state, agent staffed, idle agents etc on graphical real time displays

72. It should be possible to create custom report in ODBC and JDBC compliant application

73. Predefined reports like: Inbound Call History, Call Received by Agents & Call Duration, Outbound Call History, Call Dialled Number with Duration, Agent Call Received History, Day/Month Wise Inbound/Outbound Call Details, Total Dropped call Details, Abandoned call report, agent-based & skill-based reports, Agent performance report, Multimedia reports, Outbound reports, Contact summary reports, Call-by-call reports, Configuration reports

74. Export of reports to Word, Excel and PDF formats

Hard phones (IP Phones)

75. The IP Phone shall have an interactive and user-friendly

	alphanumeric display for easy use of the key phone 76. The IP Phone shall provide at least 6 programmable keys along with fixed feature buttons for Hold, Redial, Volume Up and Down, Mute, Hands free, Directory, Voice Message. It should be possible to configure Officer Login/Logout, Abbreviated Dial & Speed Dial, Display Contrast, Ring Types, etc. 77. The IP Phone shall have 100 /1000BaseT interface for connecting PC or workstations 78. The IP Phones shall support connection of Headset 79. The IP Phone shall have LED or LCD Indicator for Call Waiting and Message Waiting 80. The IP Phone shall support Dynamic Host Configuration Protocol (DHCP) based as well as statically configured IP address assignment 81. The IP Phone shall have minimum 2.2" high resolution graphical gray scale LCD display 82. It shall be possible to create Local Phone book with at least 50 contacts as well as pull information from the directory server (Integration with Active Directory, etc.). 83. The IP Phones shall support industry standard audio codecs 84. The IP Phone shall support Voice Activity Detection, Silence Suppression and Echo Cancellation 85. The display shall provide features such as Date and Time, Calling Party Number and Digits Dialled 86. IP Phones shall be able to work on SIP and H.323 protocols 87. There shall be provision to provide electrical power to the IP phones through power adapter and via PoE	

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(IEEE 802.3af) enabled Ethernet port

88. The firmware of IP phones shall be upgradable using HTTPS /FTP / TFTP/SFTP.

89. It shall be possible to view call history for at least last 10 missed calls, 10 dialed calls and 10 received calls

90. The IP Phones shall be SNMP manageable directly or through the PBX server

91. Desk or wall mountable with wall mount adapter.

Information regarding required quantities

92. IP PBX system to be configured with minimum 2 PRI cards, 3 SIP interfaces, 10 analog PSTN interfaces and 50 internal connections

93. Contact Centre, ACD, Desktop Agents, Voice Recording, Reporting for 20 Agents, 5 Supervisors

94. Voice Recording application with encryption and 90 days local storage

95. IP Hard Phones for all Agents, Supervisors and intercoms – 35 nos

96. Soft Phones application and High Quality Head Phones for 20 Agents, 5 Supervisors

8. Supply, assembly, installation and handing over of following furniture items as per details given below.

Sl No	Generic name of the item with detailed specifications	Quantity
8	**Furniture** - the integrated control room with high quality furniture consisting of control room console desks, conference hall table, TV Unit for Video conference, Sofas, Centre table, chairs etc.	
8.1	**2 Seater Console Desks - for 2 adjoining rooms**	16
	1. H x W x D = 750mm X 1968mm X 1100mm 2. Extruded Aluminum Profile structure (Powder Coated) with MS (2mm) Top Frame & Bottom Foot. 3. Laminated 27mm (±1mm) MDF Board Side Panels (Fixed side panels, Laminated 19mm (±1mm) MDF Board Based Storage Cabinet front & back modesties (Side modesties are on hinges &Openable with push lock,) 4. Table top in Laminated 27mm (±1mm) MDF Board with Nosing. 5. Wire Managers - For routing LAN & Power Cables within the Desk. 6. Power Distribution Sockets - within the Desk for Powering of Active Devices. 7. Adequate Heat management provision for Exhaust of heat from within the desk Assembly. 8. Adequate space for CPUs on tray &Other equipment placed with in the desk. 9. Designer Glass partition.	
8.1.1	**Electrical requirements for each 2 seater console desk**	

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	1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port - Socket ELCOM EMO – 71, MCB : Newtec / Havells-4 Nos 2. TB-UK 10 – PHOENIX-10 Nos 3. TB-UK 2.5 – PHOENIX-32 Nos 4. Bus Bar – Copper-2 Nos 5. Ethernet Communication Socket (RJ 45) - Crabtree/Bestnet/AMP/DLink-12 Nos 6. Telephone Jack (RJ 11) - Crabtree/Bestnet/AMP/DLink-4 Nos 7. Internal LED Tube Light – Philips-4 Nos 8. Door Switch (Micro Switch) – Vaishno-8 Nos 9. Fan 90 CFM 4" x 4" - Rexnord / Sunnon-8 Nos 10. Toggle Switch – Anchor-8 Nos 11. Wire as per rating - Polycab / Havells / Finolex	
8.2	**Chairs** 1. Medium Back Chair with Adjustable P.U Arms. 2. Nylon Base, Gas Lift. 3. Seat & Back Net Tapestry. 4. Synchro tilt Mechanism	94
8.3	**Conference Table** 1. H x W x D = 750mm X 7200mm X 1200mm 2. Table Top is pure Solid Sheesham or teak wooden as primary material. Table Top Edge thickness is minimum 52mm. 3. Power Distribution Sockets on the Table for Powering of Active Devices.	1
8.3.1	**Electrical Requirements** 1. 5/13 Amp Socket- Socket ELCOM EMO – 71-12 Nos 2. Ethernet Communication Socket (RJ 45)- Crabtree/Bestnet/AMP/D-Link-4 Nos 3. HDMI Port-4 Nos 4. VGA Port-4 Nos 5. Wire as per rating- Polycab/Havells/ Finolex	
8.4	**Table Unit for Video ConferenceCamera Unit** 1. H x W x D = 750mm X 800mm X 400mm 2. Laminated 19mm (±1mm) MDF board based structure. 3. Power Distribution Sockets on the Table for Powering of Active Devices.	1
8.4.1	Electrical Requirements 1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port- Socket ELCOM EMO – 71, MCB: Newtec/ Havells-4 Nos 2. Wire as per rating- Polycab/Havells/ Finolex	

8.5	**WorkStation Table**	**1**
	1. H x W x D = 750mm X 1200mm X 750mm 2. Laminated 19mm (±1mm) MDF Based Drawer Unit. 3. Table top in Laminated 27mm (±1mm) MDF Board, Side Panels & Modesty in Laminated 19mm (±1mm) MDF Board (Fixed Back Modesty &Openable Front Modesty on hinges). 4. Wire Managers - For routing LAN & Power Cables within the Table. 5. Adequate Heat management provision for Exhaust of heat from within the desk Assembly. 6. Power Distribution Sockets - within the Table for Powering of Active Devices.	
8.5.1	Electrical Requirements	
	1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port- Socket ELCOM EMO – 71, MCB : Newtec / Havells- 1 Nos 2. TB-UK 2.5- PHOENIX-3 Nos 3. Ethernet Communication Socket (RJ 45)- Crabtree/Bestnet/AMP/DLink-3 Nos 4. Telephone Jack (RJ 11)- Crabtree5/Bestnet/AMP/DLink-1 Nos 5. Fan 90 CFM 4" x 4"- Rexnord / Sunnon-1 Nos 6. Toggle Switch- Anchor-1 Nos 7. Wire as per rating- Polycab / Havells / Finolex	
8.6	**Office Cabin Table**	**3**
	1. H x W x D = 750mm X 2400mm X 800mm 2. Laminated 19mm (±1mm) MDF Based Drawer Unit. 3. Table top in Laminated 27mm (±1mm) MDF Board, Side Panels & Modesty in Laminated 19mm (±1mm) MDF Board (Fixed Back Modesty &Openable Front Modesty on hinges). 4. Wire Managers - For routing LAN & Power Cables within the Table. 5. Adequate Heat management provision for Exhaust of heat from within the desk Assembly. 6. Power Distribution Sockets - within the Table for Powering of Active Devices.	
8.61	Electrical Requirements	
	1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port- Socket ELCOM EMO – 71, MCB : Newtec / Havells- 1 Nos 2. TB-UK 2.5- PHOENIX-3 Nos 3. Ethernet Communication Socket (RJ 45)- Crabtree/Bestnet/AMP/DLink-3 Nos 4. Telephone Jack (RJ 11)- Crabtree5/Bestnet/AMP/DLink-1 Nos 5. Fan 90 CFM 4" x 4"- Rexnord / Sunnon-1 Nos	

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	6. Toggle Switch- Anchor-1 Nos Wire as per rating- Polycab / Havells / Finolex	
8.7	**Data Preparation& Operation Table-DM** 1. H x W x D = 750mm X 6000mm X 1200mm 2. Extruded Aluminum profile structure with MS Frame/Foot (Powder Coated). 3. Table Top in Laminated 27mm (±1mm) MDF Board, Drawer unit in laminated 19mm (±1mm) MDF board. 4. Special Trolley for CPU with adjustable width. 5. Wire Managers - For routing LAN & Power Cables within the Table. Power distribution unit for powering of active devices.	1
8.7.1	Electrical Requirements 1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port- Socket ELCOM EMO – 71, MCB : Newtec / Havells-8 Nos 2. TB-UK 10- PHOENIX-3 Nos 3. TB-UK 2.5- PHOENIX-16 Nos 4. Bus Bar- Copper-1 Nos 5. Ethernet Communication Socket (RJ 45)- Crabtree/Bestnet/AMP/DLink-24 Nos 6. Telephone Jack (RJ 11)- Crabtree/Bestnet/AMP/DLink-8 Nos 7. Wire as per rating- Polycab /Havells/Finolex	
8.8	**3 Seater Sofa** 1. Teak Wood (class 1) Three Seater Sofa in Fresh Walnut Finish 2. Wooden structure Contemporary Sofa reflects designs that are current or en vogue. 3. High quality foamed base and back support.	4
8.9	**2 Seater Sofa** 1. Teak Wood (class 1) Three Seater Sofa in Fresh Walnut Finish 2. Wooden structure Contemporary Sofa reflects designs that are current or en vogue. 3. High quality foamed base and back support	2
8.10	**Center Table** 1. H X W X D = 400mm X 990mm X 610mm of High quality solid wood center table.	6
8.11	**Corner Table** 1. H X W X D = 550mm X 600mm X 600mm of High quality solid wood corner table.	2
8.12	**Data Management Console Desk** 1. H x W x D = 750mm X 3000mm X 2400mm 2. Extruded Aluminum profile structure with MS Frame/Foot (Powder Coated). 3. Table Top in Laminated 27mm (±1mm) MDF Board, Drawer unit	1

	in laminated 19mm (±1mm) MDF board. 4. Special Trolley for CPU with adjustable width. 5. Wire Managers - For routing LAN & Power Cables within the Table. Power distribution unit for powering of active devices.	
8.12.1	Electrical Requirements	
	1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port- Socket ELCOM EMO – 71, MCB : Newtec / Havells-4 Nos 2. TB-UK 10- PHOENIX-3 Nos 3. TB-UK 2.5- PHOENIX-8 Nos 4. Bus Bar- Copper-1 Nos 5. Ethernet Communication Socket (RJ 45)- Crabtree/Bestnet/AMP/DLink-12 Nos 6. Telephone Jack (RJ 11)- Crabtree/Bestnet/AMP/DLink-4 Nos 7. Wire as per rating- Polycab /Havells/Finolex	
8.13	**Console Desk**	**6**
	1. H x W x D = 750mm X 1968mm X 1100mm 2. Extruded Aluminum Profile structure (Powder Coated) with MS (2mm) Top Frame & Bottom Foot. 3. Laminated 27mm (±1mm) MDF Board Side Panels(Fixed side panels, Laminated 19mm (±1mm) MDF Board Based Storage Cabinet front & back modesties (Side modesties are on hinges &Openable with push lock,) 4. Table top in Laminated 27mm (±1mm) MDF Board with Nosing. 5. Wire Managers - For routing LAN & Power Cables within the Desk. 6. Power Distribution Sockets - within the Desk for Powering of Active Devices. 7. Adequate Heat management provision for Exhaust of heat from within the desk Assembly. 8. Adequate space for CPUs on tray & other equipments placed with in the desk. 9. Designer Glass partition.	
8.13.1	Electrical Requirements	
	1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port - Socket ELCOM EMO – 71, MCB : Newtec / Havells-2 Nos 2. TB-UK 10 - PHOENIX-5 Nos 3. TB-UK 2.5 – PHOENIX-16 Nos 4. Bus Bar – Copper-1 Nos 5. Ethernet Communication Socket (RJ 45) - Crabtree/Bestnet/AMP/DLink-6 Nos 6. Telephone Jack (RJ 11) - Crabtree/Bestnet/AMP/DLink-2 Nos 7. Internal LED Tube Light – Philips-2 Nos	

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	8. Door Switch (Micro Switch) - Vaishno-4 Nos 9. Fan 90 CFM 4" x 4" - Rexnord / Sunnon-4 Nos 10. Toggle Switch – Anchor-4 Nos 11. Wire as per rating - Polycab / Havells / Finolex	
8.14	**Work Station Table**	**1**
	1. H x W x D = 750mm X 3300mm X 600mm 2. Laminated 19mm (±1mm) MDF Based Drawer Unit. 3. Table top in Laminated 27mm (±1mm) MDF Board, Side Panels & Modesty in Laminated 19mm (±1mm) MDF Board (Fixed Back Modesty &Openable Front Modesty on hinges). 4. Wire Managers - For routing LAN & Power Cables within the Table. 5. Adequate Heat management provision for Exhaust of heat from within the desk Assembly. 6. Power Distribution Sockets - within the Table for Powering of Active Devices.	
8.14.1	Electrical Requirements	
	1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port - Socket ELCOM EMO – 71, MCB : Newtec / Havells-1 Nos 2. TB-UK 10 – PHOENIX-3 Nos 3. Ethernet Communication Socket (RJ 45) - Crabtree/Bestnet/AMP/DLink-3 Nos 4. Telephone Jack (RJ 11) - Crabtree/Bestnet/AMP/DLink-1 Nos 5. Fan 90 CFM 4" x 4" - Rexnord / Sunnon-1 Nos 6. Toggle Switch – Anchor-1 Nos 7. Wire as per rating - Polycab / Havells / Finolex	
8.15	**Conference Table**	**1**
	1. H x W x D = 750mm X 4000mm X 2700mm 2. Table Top is pure Solid Sheesham or teak wooden as primary material. Table Top Edge thickness is 52mm. 3. Power Distribution Sockets on the Table for Powering of Active Devices.	
8.15.1	Electrical Requirements	
	1. 5/13 Amp Socket- Socket ELCOM EMO – 71-21 Nos 2. Ethernet Communication Socket (RJ 45)- Crabtree/Bestnet/AMP/D-Link-7 Nos 3. HDMI Port-7 Nos 4. VGA Port-7 Nos 5. Wire as per rating- Polycab/Havells/ Finolex	
8.16	**Console Desk**	**2**
	1. H x W x D = 750mm X 1968mm X 1100mm 2. Extruded Aluminum Profile structure (Powder Coated) with MS (2mm) Top Frame & Bottom Foot.	

	3. Laminated 27mm (±1mm) MDF Board Side Panels(Fixed side panels, Laminated 19mm (±1mm) MDF Board Based Storage Cabinet front & back modesties (Side modesties are on hinges &Openable with push lock,) 4. Table top in Laminated 27mm (±1mm) MDF Board with Nosing. 5. Wire Managers - For routing LAN & Power Cables within the Desk. 6. Power Distribution Sockets - within the Desk for Powering of Active Devices. 7. Adequate Heat management provision for Exhaust of heat from within the desk Assembly. 8. Adequate space for CPUs on tray & other equipments placed within the desk. 9. Designer Glass partition.	
8.16.1	Electrical Requirements	
	1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port - Socket ELCOM EMO – 71, MCB : Newtec / Havells-2 Nos 2. TB-UK 10 – PHOENIX-5 Nos 3. TB-UK 2.5 – PHOENIX-16 Nos 4. Bus Bar – Copper-1 Nos 5. Ethernet Communication Socket (RJ 45) - Crabtree/Bestnet/AMP/DLink-6 Nos 6. Telephone Jack (RJ 11) - Crabtree/Bestnet/AMP/DLink-2 Nos 7. Internal LED Tube Light – Philips-2 Nos 8. Door Switch (Micro Switch) – Vaishno-4 Nos 9. Fan 90 CFM 4" x 4" - Rexnord / Sunnon-4 Nos 10. Toggle Switch - Anchor-4 Nos 11. Wire as per rating - Polycab / Havells / Finolex	
8.17	**High Quality Leather chairs with wheels**	**18**
	1. Dimensions: Length -27 Inch, Width -24 inch, Height -45 Inch, Seat Height: 18 - 21 Inch 2. Primary Material with Leatherette, Frame Material: Moulded Commercial Ply, 3. Base Material: Metal with Chrome, Arm: Metal armrest, Caster: 50MM Nylon Castor 4. Upholstery Material: Leatherette, Filling Material: Foam with High Density, 5. Features: Upholestry Color: Brown, Style: Contemporary, Design: Ergonomic, Armrest: D Shape Fixed, Mechanism: Height Adjustable, Tilt Mechanism, 360 degree Swivel with wheels	
8.18	**Data Preparation& Operation Table-IS**	**1**
	1. H x W x D = 750mm X 3000mm X 1200mm	

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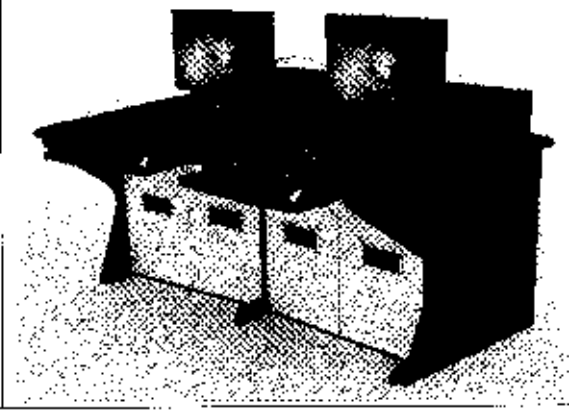
	2. Extruded Aluminum profile structure with MS Frame/Foot (Powder Coated). 3. Table Top in Laminated 27mm (±1mm) MDF Board, Drawer unit in laminated 19mm (±1mm) MDF board. 4. Special Trolley for CPU with adjustable width. 5. Wire Managers - For routing LAN & Power Cables within the Table. Power distribution unit for powering of active devices.
8.18.1	Electrical Requirements: 1. 4 Way PDU with 5/13 Amp Universal Socket & Switch with 1 Nos. of 16 Amp SP MCB, 1 HDMI Post & 1 VGA Port- Socket ELCOM EMO – 71, MCB : Newtec / Havells-4 Nos 2. TB-UK 10- PHOENIX-3 Nos 3. TB-UK 2.5- PHOENIX-8 Nos 4. Bus Bar- Copper-1 Nos 5. Ethernet Communication Socket (RJ 45)- Crabtree/Bestnet/AMP/DLink-12 Nos 6. Telephone Jack (RJ 11)- Crabtree/Bestnet/AMP/DLink-4 Nos 7. Wire as per rating- Polycab /Havells/Finolex
8.19	General terms and conditions The furniture shall be complete with sockets for power, network Wiring for power socket within furniture is also covered in the scope of furniture vendor However, the input power shall be provided by department to the module of single point in each room For network cables, race ways/conduits within furniture with I/O socket shall be provided by the vendor. The brand/makes where ever mentioned are indicative only and those brands or equivalent shall be considered.

Reference Pictures for Furniture

#	Item	Reference picture
1	**2 Seater Console Desks: (DM Control Room)**	

	Chairs	
2	2 Seater Console Desks: (IS Control Room)	
	Chairs	
3	Conference Room Table	
	Table for VC Camera Unit	

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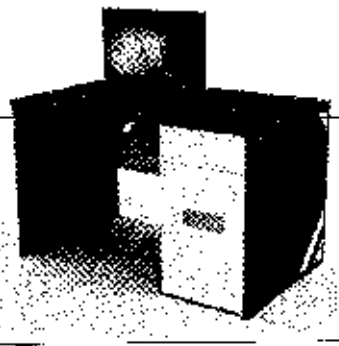
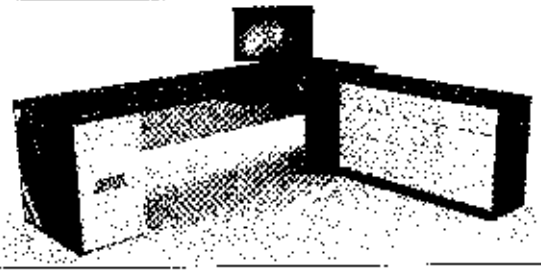
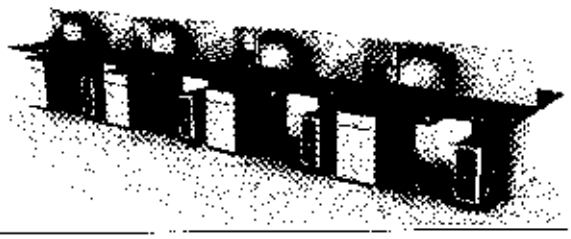
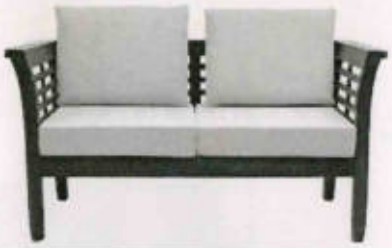
	Workstation Table	
	Chairs	
4	Office Cabin Table	
	Chairs	
5	Data Preparation & Operation Table:	

	Chairs	
6	VIP Interaction Room- 3 Seater Sofa	
	VIP Interaction Room- 2 Seater Sofa	
	VIP Interaction Room- Center Table	
	VIP Interaction Room- Corner Table	
7	Data Management Console	

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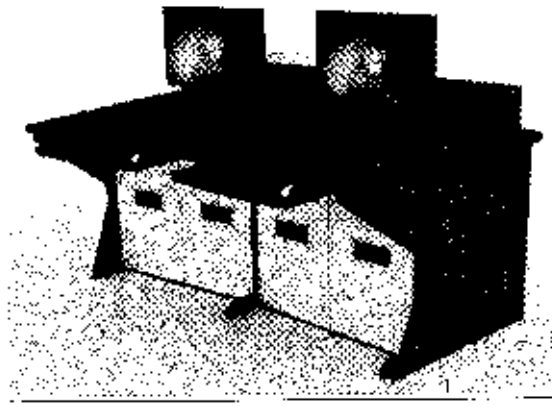
	Chairs	
8	Control Room IS Console Desk	
	Workstation Table	
	Chairs	
9	Conference Table North Block, MHA	

	Chairs	
	Control Room IS Console Desk	

9. Terms and Conditions

The following terms and conditions are complementary and in addition to the terms and conditions specified in the previous sections 1 to 8 and in those appearing in other parts of the OTE document.

Sl.No	Generic name of the item with detailed specifications	Qty
9.1	**Installation and Commissioning**	**1 lot**
	1. Supply , Installation, Integration, Commissioning and handing over of ICR-ER as per Sections 1-8 in Appendix - 2. 2. The ICR-ER project should be completed within 180 months from the date of purchase order. 3. The Prime vendor may bid for the RFP document, as it is his responsibility to setting-up of ICR-ER which comprising of civil works. Computer infrastructure & communication component etc.,. The department will deal with only the Prime vendor as a single point of	

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contact who shall have the sole responsibility for the entire assignment.
4. Vendor should install & commission the systems as per the configuration at NDCC towers, New Delhi, MHA North Block, New Delhi and NRSC site in Shadnagar(approx. 30 Km from Hyderabad Airport)
5. System installation, commissioning is the responsibility of the vendor and OEM. The respective OEM engineers must actively participate in the installation & commissioning along with the system integrator, for which necessary back-to-back arrangements are to be ensured
6. The scope of the installation covers the complete installation, integration and commissioning of all the hardware and software items.
7. At the time of installation and commissioning of the configuration if it is found that some additional hardware accessories or software items with licenses are required to complete the configuration, which were not included in the vendor's original list of deliverables then the vendor is required to supply such items to ensure the completeness of the configuration at no extra cost
8. Vendor should ensure completeness of the list of deliverables in the offer to avoid such discovery during installation
9. Vendor should resolve all issues related to compatibility of hardware, drivers and other system software with Red Hat and Windows OSs.

9.2	**Training on ICR-ER- Subsystems**	**1 lot**

1. Training for 30 Persons shall be provided onsite by the vendor or vendor's representatives / respective OEMs for a minimum period of 10 days.
2. The training should comprehensively cover all the supplied sub-systems, their integration and operations.
3. Installation of all hardwares and softwares
4. General system administration, maintenance & operations
5. Installation, configuration and administration of all storage & backup infrastructure including primary & secondary storage, NAS & SAN software features, storage management software, tape library, backup software, etc.
6. Installation, configuration and administration of network infrastructure including switches, routers, firewalls, AAA appliance, load balancers, KVM devices, network management software
7. Installation & configuration of all software items supplied
8. Performance analysis & tuning
9. Problem diagnosis, pre-failure alerts, logs management, reports, and problem resolution.
10. All types of storages-DMZ, All flash, Common Unified NAS/SAN, Archival Object, tape library, backup software
11. Rack Servers and HCI Infrastructure
12. LAN, WAN, network and security devices
13. All supplied softwares including server & storage management

	softwares, NMS, Anti-virus software, etc. 14. Videowalls, TVs, Conferencing System, PBX telephone Call Center, Etc 15. Comprehensive hardcopy training course material must be provided	
9.3	**Warranty & technical support** 1. Comprehensive on-site warranty for all the supplied hardware and software for a period of three years. 2. The warranty start date shall be from date of successful completion, installation and acceptance of the project. 3. The technical support during the warranty period should meet 4 hours response time and NBD parts replacement/ resolution time. 4. The vendor must have necessary back-to-back arrangement with the respective OEMs for all the quoted products to ensure competent and timely support 5. The warranty for the systems infrastructure/ equipment shall include disks, batteries, etc. 6. All supplied software & firmware licenses must be perpetual with supply & installation of updates and upgrades for all the softwares including operating systems, application software, firmware, etc 7. The technical support from vendor includes reconfigurations, performance optimizations, guidance on usage and software aspects, technical help in planning for augmentations, etc. 8. The vendor must have relevant OEM trained certified engineers locally available to provide warranty support and who can handle independently the total solution. 9. The vendor should clearly provide escalation matrix for resolving problems for all the sub systems. 10. If unresolved issues are pending, warranty duration would be extended till satisfactory resolution of issues without any extra cost 11. Failed disks must be replaced with new ones at no extra charges and the faulty disks will not be returned to the vendor. No disk retention charges would be paid. 12. Onsite technical support services and facility management during the warranty period to be provided as described in section 9.4.	
9.4	**Onsite technical support services and facility management**	**01 lot**
	1. To ensure continuous problem-free infrastructure uptime and operational efficiency of the established ICR-ER facility, annual onsite engineer services for technical support and facility management to be provided during the entire warranty and post-warranty CAMC period. This is estimated to require a minimum of 6 man-years effort annually, for which 6 site engineers are to be positioned. 2. These services are complementary to and in addition to the warranty and post warranty parts replacement and technical support (preventive	

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	& corrective) services rendered by the system integrator and OEMs. 3. Competent and experienced technical personnel must be deployed at the two sites, NDCC-II and North Block. Temporary limited period deployments may be necessitated at NDEM facility at NRSC, Shadnagar based on specific needs. 4. The services should be rendered in general or in 2/3-shift operations based on regular need assessments. Round-the-clock operations support would be required during disaster/ emergency situations. 5. The deployed engineers must be well versed in all the supplied subsystems and operational workflows to ensure efficient services pertaining to system monitoring, failure identification, call reporting/ follow up, problem diagnosis, troubleshooting, resolution and restoration of operations. The services include logs management, reports generation, data backups/ restore, configuration/ reconfigurations, operational guidance, etc. 6. The site engineers must individually and collectively possess skills encompassing server systems, storage systems, network & security devices, OS (Windows & Linux), virtualization, system administration, Web applications, databases, PBX, contact centre software, other softwares, etc. 7. The service engineers must be on the rolls of the vendor/ system integrator and carry valid ID card. Necessary prior information to be provided to the Ministry for entry permission into the MHA premises at NDCC-II or North Block. 8. These services are to be offered built-in & inclusive in the 3-year warranty period. For the 3 year post-warranty CAMC period, annual charges per each year need to be quoted with payments made at end of every quarter based on satisfactory services.	
9.5	**Post Warranty & CAMC** 1. After the expiry of initial 3 year warranty period, post-warranty Comprehensive Annual Maintenance Contract (CAMC) is to be provided for the next 3 years. 2. The annual CAMC bids for 4th, 5th and 6th years need to be submitted in the price bid. 3. The CAMC comprises of onsite comprehensive hardware maintenance, software support & upgrades, etc. with OEM support in respect of entire supplied equipments /sub-systems /configurations as per sections 1 to 8 in Appendix-2. 4. All other terms specified under 'Warranty & technical support;(section 9.3) section are also applicable for the post warranty maintenance(CAMC). 5. Onsite technical support services and facility management services to be provided during the CAMC periods as described in section 9.4.	1 lot

	6. The CAMC charges will be for paid quarterly at the end of each quarter on satisfactory services.	
9.6	**Other Technical terms & conditions**	**1 lot**
	1. The vendor should ensure smooth and complete integration and inter-compatibility of all the sub systems and components comprising the total solution of ICR-ER. 2. The vendor shall provide a detailed technical compliance statement mandatorily for all the tender specifications/ clauses for all the sections from 1 to 10 (including this section) as per the specified format in Appendix-5. 3. The vendor should list detailed bill of materials for all the items and sub-items offered along with part numbers. Any item given as complied and not listed in bill of material is liable to be treated as non-compliant. 4. Complete ownership of ensuring the solution in a working condition as mentioned in the tender document lies with the vendor only. Any components/ accessories like cables, etc should be included in the quote and vendor should agree to supply the items missed/ short shipped at no additional cost. 5. Near obsolete and out-dated technology based products should not be quoted/ offered as a part of the solution. All supplied items must be brand new and refurbished items are not acceptable 6. Each item offered shall have a minimum support life of seven years 7. The vendor must take full responsibility for total supply, installation and integration and successful testing of all the quoted items 8. The quoted make and models must be clearly specified for all the items/ sub-items 9. Full technical specifications and literature must be provided for all the quoted items including sub-items 10. The vendor must have proven experience in installing, integrating and supporting similar data centers consisting of servers, storage, network, WAN and management softwares in the last three years in 24X7 working mode. Also should provide the user/ site details with documentary proofs 11. The vendor must have certified skilled, trained and experienced manpower with technical competence on all the quoted products 12. Any required software/ drivers to make the given items usable should be delivered. 13. The Vendor should ensure availability & supply of required spares and consumables at least for the next seven years after installation and successful integration of equipment. 14. The bidder must have strong local presence in New Delhi of trained and experienced support engineers on all quoted products 15. All network storage systems quoted must be from same OEM, who is internationally reputed data centre network storage OEM	

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16. All server systems quoted must be from same OEM, who is internationally reputed data centre server OEM
17. All necessary cables, connectors, adapters, accessories etc., should be supplied by the vendor as required for the successful integration of the total solution
18. Mutually acceptable acceptance test procedure (ATP) document should be provided by the vendor. Acceptance Test on the supplied Systems/ equipments must be conducted as per the ATP document
19. Supplied items should work on 230V, 50 Hz, AC power supply
20. All the licenses for given hardware and software should be perpetual and valid for life-long.
21. Any defective/failed storage hard disk or magnetic media (LTO) or any storage media shall be replaced by the vendor free of cost without insisting on return of defective media. The defective media will not be given to the vendor
22. Vendor should provide the total power consumption and heat dissipation details along with the quotation for the supplied items
23. Vendor should treat all the batteries supplied along with servers/storage systems as components and should replace batteries during warranty period without extra cost
24. All power sockets/fixtures at the installation site are Indian type
25. The bidder must submit the offer as a two-part bid. In the technical bid, the list of deliverables must be clearly specified. Unpriced commercial bid (template) must also be submitted in the technical bid
26. The project/ activity must be completed on turnkey basis, integrating both hardware, system software and application software by a single vendor/ system integrator
27. At the time of installation, if it is found that some additional hardware or software items are required to meet the operational requirement of the configuration, but not included in the vendor's original list of deliverables, the vendor shall supply such items to ensure the completeness of the configuration.
28. The quote must be complete in all respects. Incomplete and ambiguous quotes are liable to be rejected
29. Amendments and additions to tender after opening of bids are liable to be ignored
30. Any non-compliance to any of the clauses in the tender specs will lead to disqualification

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APPENDIX-3

Tender Form

NOTE THAT IF THE ANSWER SO FURNISHED ARE NOT CLEAR AND/OR EVASIVE THE TENDER WILL BE LIABLE TO BE IGNORED

Sl. No.	Question	Answer By the Bidder	Ref Page No in the Bid Document in Support of the claim by the Bidder.
1.	Tender Enquiry No.		
2.	Whether the Tender is signed by the authorized person.(Authority letter to be enclosed)		
3.	Whether you have agreed for the Tender validity (180 days after opening of Tender) (Enclose Certificate)		
4.	Whether the stores offered fully conform to the technical particulars and specification/drawings specified in the schedules to tender. If not whether the details of deviations have been mentioned in the proforma for the statement of deviations		
5.	Brand of the stores offered		
6.	Please conform whether the store(s) will be supplied with packing and marking clause stipulated in the tender enquiry		
7.	Gross weight of the consignment and net weight of each item		
8.	Please conform whether the store(s) will be supplied with packing and marking clause stipulated in the tender enquiry		
9.	Whether the Required EMD (amount **Rs 80,00,000/-** validity etc.)/exemption documents have been provided before tender opening.		
10.	The Tenderer should have average annual turnover of **Rs. 50 crore** during the period of last 3 years i.e.2016-17, 2017-18 & 2018-19 to meet the	2016-17 2017-18	

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Govt of India, N

	obligation under contract. Tenderer should submit audited balance sheet for last 03 years and bank's report for their credit worthiness.	2018-19 Total Average -
11.	Whether the Bidder Firm (manufacturer or principal of authorized representative) have negative net worth on the closing day of any the last 3 financial year.	
12.	Whether the Bidder has agreed to give the required performance security.	
13.	Whether you have agreed to other essential condition(s) especially incorporated in the tender enquiry like terms of payments, liquidated damages clause, Guaranty-warranty clause.	
14.	Whether you have Poor/unsatisfactory past performance.	
15.	Whether you have been debarred/blacklisted by any government authority.	
16.	Whether you have quoted for the entire scope of work of the project as specified in the list of requirements in the quoted Annexure/	
17.	Whether you have signed Integrity Pact as Appendix 9 of TE.	
18.	Details of the Permanent Income Tax Account No. of foreign manufacturer and the Indian agent.	
19.	Whether the latest Income Tax Clearance Certificate has been attached.	
20.	Whether you have completed successfully at least **01** such Project in the last **5 years** before the date of opening of tender and functioning satisfactorily, without adverse report. Report from the institution to whom it has been supplied about satisfactory performance must be enclosed with technical bid.	
21.	**Status :** a) Are you registered with NSIC / Ministry of Home Affairs, New Delhi for the item IT related items? If so, indicate whether there is any monetary limit on registration and also indicate validity of registration.	

	b) If you are a Small Scale Unit registered with NSIC under Single Point Registration Scheme for subject (IT related) item, whether there is any monetary limit.		
	c) In case you are registered with NSIC under Single Point Registration Scheme for the item quoted, confirm whether you have attached an attested photocopy of the registration certificate indicating the items for which you are registered.		
22.	Business name and the constitution of the firm :- Is the firm is registered under the (a) Indian Company Act (b) Indian Partnership Act (c) any other act. If not please give the full name(s) and address(es) of the owner(s)		
23.	Whether the tendering firm is/are a) OEM of IT & Networking equipment b) System Integrator c) Joint Venture d) Turnkey Solution Provider		
24.	Do you agree to **sole arbitration** by Secretary, Ministry of Home Affairs or by other some other person appointed by him as provided in Clause 9.9.1 and 9.9.2 of Manual for procurement goods 2017,MOF (Your acceptance or non-acceptance of this clause will not influence the decision of the tender. It should, however, be noted that an omission to answer the above question will be deemed as an acceptance of the clause).		
25.	**Are you :-** a) Holding valid Industrial License(s) Registration Certificate under the Industrial Development and Regulation Act, 1981. If so, please give particulars of Industrial Income Registration Certificate;		

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(SURESH KUMAR)
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गृह मंत्रालय
Ministry of Home Affairs

	b) Exempted from the licensing provision of the Act, for the manufacture of item quoted against this tender. If so, please quote relevant orders and explain your position:	
26.	State whether business dealings with you have been banned by Ministries/Department of Supply/Ministry of Home Affairs	
27.	Please confirm that you have read all the instructions carefully and have complied with the instructions accordingly.	
28.	Whether you unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.	

Signature of the Tenderer: _____

(1) Full name and Address of the person signing (in block letters)

(2) Whether signing as Proprietor/ Constituted Attorney/Duly authorized by the company

Signature of witness:

Full name and address of the Witness (in block letters)

OPEN TENDER ENQUIRY NO. 41-14/2016-NDM-I/AD Dated:17.09.2019

APPENDIX -4

QUESTIONNAIRE

(Please Mark in appropriate Box and fill the answer correctly. Tenders leaving the box unmarked and questionnaire unanswered shall be rejected)

1.	Name and Address of contractor		
2.	Whether Registered/Enlisted with NSIC for subject (IT related) stores along with Foreign Manufacturer	**YES**	**No**
3.	Whether past supplier of the subject stores to ..... during the last 05 year (If yes, submit the performance statement Item wise in the enclosed proforma)	**YES**	**NO**
4.	Term of Delivery:- Whether you agree with the terms and conditions of delivery i.e. FOR destination at Consignees location	**YES**	**No**
5.	a) Whether stores fully conforms to the Tender Schedule Specification. b) If no indicate the details of deviation on separate Sheet	**YES**	**No**
6.	Acceptance to conditions of contract as per GFR 2017 and Manual for procurement of Goods 2017 published by Ministry of Finance.	**YES**	**No**

Signature of Tenderer_____

Name in Block Letters_____

Capacity in which tender signed_____

Full address_____

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(SURESH KUMAR)
उप सचिव
Deputy Secretary
गृह मंत्रालय
Ministry of Home Affairs

APPENDIX -5

COMPLIANCE STATEMENT FOR SPECIFICATIONS OF: " ICR-ER"

1. Name of Item:
2. Brand of Item/Country of origin:_____
3. Make & Model: _____

Tenderer are requested to give Compliance of each Specification whether equipment being offered by them is complying with Specification or otherwise.

QRs compliance for _____

Para of Tender enquiry specifications	Specification of item offered	Compliance to RFP/Tender specification whether Yes or no	Confirmation of the specification in page/para of the brochure / technical literature (wherever such brochure is required to confirm the specifications	In case of non-compliance, deviation from RFP to be specified in unambiguous terms
1	2	3	4	5

Signature of the Bidder

APPENDIX-6

PERFORMANCE STATEMENTFOR LAST FIVE YEARS AS PER CLAUSE 05 OF ANNEXURE - II

Serial.No.	Name of Firm	Contract No.	Description of Stores	Quantity on order	Value	Original D.P.	Qty. supplied within original D.P.	Final/ Ext. D.P.	Last supply position	Reasons for Delay in supplies (If any)

i) Manufacturer /Supplier should give proof of documents to establish that similar equipment functioning satisfactorily at the supplied locations, at least for last 05 years.
ii) Tenderer should submit Balance Sheet for last 03 years.
iii) Copy of supply order be attached.

Signature of tenderer
Date
Name of tenderer

(SURESH KUMAR)
Deputy Secretary
Ministry of Home Affairs
Govt of India, N. Delhi

OPEN TENDER ENQUIRY NO. 41-14/2016-NDM-I/AD Dated:17.09.2019

APPENDIX-7

BANK GUARANTEE PROFORMA FOR FURNISHING EMD

To

Director/ Deputy Secretary (DM – I)
DM Division, Ministry of Home Affairs
3rd Floor, NDCC-II Building
Jai Singh Road
New Delhi – 110001

Whereas..... (hereinafter called the "tenderer") has submitted their offer dated.....for the supply of.....(hereinafter called the "tender") against the purchaser's tender enquiry No..... KNOW ALL MEN by these presents that WE.....of.....having our registered office at.....are bound unto.....(hereinafter called the "Purchaser) in the sum of .....for which payment will and truly to be made to the said Purchaser, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this.....day of.....20....

THE CONDITIONS OF THIS OBLIGATION ARE:

(1) If the tenderer withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of this tender.

(2) If the tenderer having been notified of the acceptance of his tender by the Purchaser during the period of its validity:-

a) If the tenderer fails to furnish the Performance Security for the due performance of the contract.

b) Fails or refuses to accept/ execute the contract.

We undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or both the two conditions, specifying the occurred condition or conditions.

This guarantee will be valid for **45** days beyond the period of offer validity and any demand in respect thereof should reach the Bank not later than the above date.

When communication is received from or on behalf of Director/ Deputy Secretary (DM-I), DM Division, Ministry of Home Affairs, 3rd Floor, NDCC-II Building, Jai Singh Road, New Delhi–110001 to invoke this Bank Guarantee, the amount will be remitted to in favour of US (Cash), Ministry of Home Affairs, New Delhi.

.....
(Signature of the authorized officer of the Bank)

.....
Name and designation of the officer
Seal, name & address of the Bank and address of the Branch

APPENDIX-8

GUARANTEE/WARRANTY

i) The contractor/seller hereby declares that the goods, stores articles sold/supplied to the purchaser under this contract shall be of the best quality and workmanship and new in all respects and shall be strictly in accordance with the specification and particulars contained/mentioned in contract.

ii) The contractor/seller hereby guarantees that the said goods/stores/articles would continue to conform to the description and quality aforesaid for a period of **03year**, from the date of successful commissioning of the said project/goods/stores/articles to the purchaser and that notwithstanding the fact that the Purchaser (Inspector) may have inspected and/or approved the said goods/stores/articles, if during the aforesaid period of **03 year** the said goods/stores/articles be discovered not to conform to the description and quality aforesaid or not giving satisfactory performance or have deteriorated and the decision of the purchaser in that behalf shall be final and balding on the contractor/seller.

iii) The purchaser shall be entitled to call upon the contractor/seller to rectify the goods/stores/articles or such portion thereof as is found to be defective by the purchaser within a reasonable period, or such specified period as maybe allowed by the purchaser in his discretion on an application made thereof by the contractor/seller, and in such an event, the above mentioned warranty period shall apply to the goods/stores/articles rectified from the date of rectification thereof, otherwise the contractor/seller shall pay to the purchaser such compensation as may arise by reason of the breach of the warranty herein contained.

iv) If within the period of warranty, the goods are reported by the Buyer to have failed to perform as per the specifications, the Seller shall either replace or rectify the same free of charge, within a maximum period of **06 hours** of notification of such defect received by the Seller, provided that the goods are used and maintained by the Buyer as per instructions contained in the Operating Manual. Warranty of the equipment would be extended by such duration of downtime. Record of the down time would be maintained by the user in the logbook. Spares required for warranty repairs shall be provided free of cost by the Seller. The Seller also undertakes to diagnose, test, adjust, calibrate and repair/replace the goods/equipment arising due to accidents by neglect or misuse by the operator or damage due to transportation of the goods during the warranty period, at the cost mutually agreed to between the Buyer and the Seller.

v) Warranty to the effect that before going out of production for the spare parts seller will give adequate advance notice to the purchaser of the equipment so that the latter may undertake the balance of the lifetime requirements.

vi) Warranty to the effect that seller will make available the blue prints of drawings of the spares if and when required in connection with the main equipment.

vii) Guarantee that they will supply the spare parts, if and when required on agreed basis for an agreed price. The agreed basis could be and including but without limitation an agreed discount on the catalogue price or an agreed percentage of profit on landed cost.

Signature of tenderer
Date
Name of tenderer

(सुरेश कुमार)
(SURESH KUMAR)
उप सचिव
Deputy Secretary
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Ministry of Home Affairs
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Govt. of India, New Delhi

APPENDIX-9

Integrity Pact clause

(To be given on letter head of the Supplier/OEM as the case may be duly signed by the authority having legal power of attorney to bind the firm)

This Integrity Pact (hereinafter called the IP) is a fidelity agreement between the Supplier (which include all their employees, agents, consultants and also their OEM, if any), who are registered/seeks registration or awarded/seeks Contracts of MHA which include all its employees/officials/officers working as Public Authority) on the other.

2. Under this IP, It has been agreed, accepted and undertaken to use, practice and observe all the best, clean, ethical, honest and legal means & behaviour maintaining complete transparency and fairness in all activities concerning Registration, Green Channel, Bidding, Contracting/ Rate Contracting and performance thereto. Neither the Supplier nor the Public Authority which include indenters, Purchase & inspection officials of MHA shall demand or pay or accept any illicit gratification/bribe or hospitality or consideration/favour of any kind whatsoever and shall not use any corrupt practices including fraud, misrepresentation, misleading or forged/false documents, concealing/suppressing facts, undue pressures or influences from anyone (written or verbal/telephonic), bribery, rigging, cartelization, collusion, which are not limited to, but also include the following:-

a) Collusive bidding: Collusive bidding can take form of an agreement among firms to divide the market, set prices, or limit production. It can involve "wage fixing, kickbacks, or misrepresenting the independence of the relationship between the colluding parties". In legal terms, all acts affected by collusion are considered void.

b) Bid rotation: In bid-rotation scheme, conspiring firms continue to bid, but they agree to take turns being the winning (i.e. lowest qualifying) bidder. The way in which bid-rotation agreements are implemented can vary.

c) Cover bidding: Cover (also called complementary, courtesy, token, or symbolic) bidding occurs when individuals or firms agree to submit bids that involve at least one of the following: (1) a competitor agrees to submit a bid that is higher than the bid of the designated winner, (2) a competitor submits a bid that is known to be too high to be accepted, or (3) a competitor submits a bid that contains special terms that are known to be unacceptable to the purchaser.

d) Bid suppression: Bid-suppression schemes involve agreements among competitors in which one or more companies agree to refrain from bidding or to withdraw a previously submitted bid so that the designated winner's bid will be accepted. e) Market allocation: Competitors carve up the market and agree not to compete for certain customers or in certain geographic areas. Competing firms may, for example, allocate specific customers or types of customers to different firms, so that competitors will not bid (or will submit only a cover bid) on contracts offered by a certain class of potential customers which are allocated to a specific firm etc.

3. The party hereby agrees that he will not indulge in any such activity and will inform MHA if any such activity is on. The party further agrees that he will not give bribe, speed money & gifts to any public official of MHA and will not commit any offence in contravention of relevant IPC/PC Act or any Indian law in force.

4. The party hereby agrees that while canvassing order, they will not provide any inducement to the indenter, whether directly or indirectly including cash & non cash, both pre, during & post procurement action and inform the MHA, if any such event is unfolding for which MHA, on assessment of the issue, will refer the matter to the CBI, CVC and the concerned administrative authority.

5. In case of failure or default in terms of this IP, the Public Authority will be subjected to actions prescribed under CCS/CCA conduct Rules including penal actions and prosecution, while the Supplier will bear any or a combination of following penalties:

a) Cancellation of Contract/Rate Contracts (RCs)
b) Cancellation of Registration
c) Cancellation of Green Channel
d) Forfeiture of all securities and performance Bank Guarantees
e) Refusal to grant Registration for further period of 3 years.
f) Suspension and/or banning the business dealings for period upto 3 years.
g) Any other administrative or penal actions as deemed fit.
h) Action under IPC/PC Act and other relevant laws of the country.

6. It has been further agreed that the actions as aforesaid except that at 5(h) above will not require any criminal conviction from any court of law or arbitration but will be based on 'No-contest' basis, upon satisfaction of the JS (DM) MHA, who will be the competent authority to finally decide the matter on strength of such materials/evidence of default/breach of the terms under this IP.

7. It has been also agreed prescribing that within 30 days of such orders passed by JS (DM) / MHA, the aggrieved party shall have the right to appeal to next higher competent authority and till the time a decision is taken on such appeal, the decision JS (DM) / MHA would be in-force unless otherwise specifically ordered by the next higher competent authority.

8. Agreed, accepted and signed on behalf of Supplier on this day and year mentioned below and handed over to the concerned office of MHA forming integral part of all the affairs & transactions with and in relation to MHA.

Place:
Date:

Signature on behalf of Supplier firm.....
Name and designation/capacity of signatory .....
Full address of the Supplier Firm .....
Seal & Stamp of the Supplier firm.....

To,

Director/Deputy Secretary (DM-I), DM Division, MHA, 3rd Floor, NDCC-II Building, Jai Singh Road, New Delhi–110001

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(सुरेश कुमार)
(SURESH KUMAR)
उप सचिव
Deputy Secretary
गृह मंत्रालय
Ministry of Home Affairs
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

APPENDIX-10

PRICE BID FORMAT

S.No.	Items	Cost (including all duties & taxes)
1	Civil Works as per Appendix- 2 Section-1	
2	Electrical works as per Appendix-2 Section-2	
3	Air-conditioning works as per Appendix-2 Section-3	
4	Computer Systems Infrastructure- Servers, Storage & Network as per Appendix - 2 Section -4	
5	Communication links as per Appendix - 2 Section- 5	
6	Display devices as per Appendix-2 Section - 6	
7	I.P PBX and Contact Centre as per Appendix-- 2 Section - 7	
8	Furniture as per Appendix-- 2 Section - 8	
9	Total Cost of Resident site Engineers (during period of warranty for 3 yrs and CAMC of 3 yrs)	
10	Total Cost of the Turnkey Project (Sum of amount mentioned at Sr No. 1 to 9 above)	
11	Buy Back amount (to be deducted from the total cost as mentioned at Sr No. 10 above)	
12	Net Cost of the Turnkey project (after deducting Buy Back amount as mentioned at Sr No. 11 from Total Cost of the project as mentioned at Sr No. 10)	
13	CAMC for 4th year as per Appendix - 2, Section - 9	

14	CAMC for 5th year as per Appendix - 2, Section - 9	
15	CAMC for 6th year as per Appendix - 2, Section - 9	
16	NPV amount of 3 yrs AMC (as mentioned at Sr No. 13, 14, 15) (To be worked out as per DCF method)	
17	Final Cost of the Project to be considered for determination of L-1 (Sum of amount as mentioned at Sr No. 12 & 16)	

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Govt. of India, New Delhi

APPENDIX-11

TE No. ..... Dated the Month Year

PROFORMA FOR STATEMENT OF DEVIATIONS

The following are the particulars of deviations from the requirements of the instructions to bidders as contained in the General conditions of Contract and the T/E specifications and terms and conditions:-

I. STATEMENT OF DEVIATIONS FROM THE GENERAL CONDITIONS OF CONTRACT AND THE TENDER ENQUIRY TERMS AND CONDITIONS:-

CLAUSE	DEVIATION	REMARKS

II. STATEMENT OF DEVIATIONS FROM THE TENDER ENQUIRY SPECIFICATIONS:-

SL.NO. OF SPECIFICATION	DEVIATION	REMARKS

SIGNATURE AND SEAL OF THE MANUFACTURER/TENDERER

NOTE : Where there is no deviation the statement should be returned duly signed with an endorsement indicating "No Deviations"

APPENDIX-12

TE No. ..... Dated the Month Year

Final Acceptance Certificate by the Consignee

To,

M/s.....
.....
.....

Subject: Certificate of commissioning or equipment / plant and training.

This is to certify that the equipment(s)/plant(s) as detailed below has/have been received in good conditions along with all the standard and special accessories and a set of spares (subject to remarks in Para No.02) in accordance with the contract/technical specifications. The same has been installed and commissioned. The firm has also imparted training programme as per terms and conditions of contract at the best satisfaction of the user.

(a) Contract No.....Dated.....
(b) Description of the equipment(s)/Plant:.....
(c) Equipment(s)/Plant(s) Nos.....
(d) Quantity:.....
(e) Bill of Loading / Air Way/Railway Receipt/Goods Consignment Note No.....
(f) Name of Vessel/Transporters:.....
(g) Name of Consignee:.....
(h) Date of Commissioning and proving test:.....
(i) Details of Accessories / spares not yet supplied and recoveries to be made on that account.
(j) The proving test has been done to our entire satisfaction and operators have been trained to operate the equipment(s) / plant(s).
(k) Whether the receipt of store was within the stipulated time of delivery.
(l) If delivery was not given within the stipulated time, was delivery period extended from the competent authority.....

Signature of Consignee

(सुरेश कुमार)
(SURESH KUMAR)
उप सचिव
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Ministry of Home Affairs
भारत सरकार, नई दिल्ली

APPENDIX-13

PROFORMA FOR EQUIPMENT AND QUALITY CONTROL OF THE MANUFACTURING FIRM

Tender No.....Date of Opening.....

Name of the Tenderer.....

[Note: All details should relate to the manufacturer for items tendered for]

Sl.No.	Particular	
1.	Name & Full address of the manufacturer	
2.	Description of Store	
3.	i) Telephone No. ii) Fax No.	
4.	Telegraphic Address	
5.	Location of the manufacturing factory	
6.	Details of the Industrial License, wherever required as per statutory regulations	
7.	Details of important plant & machinery functioning in each department (monograph & description pamphlets be supplied, if available	
8.	Details of the process of manufacture in the factory	

9.	Details of stock of raw materials held	
10.	Production capacity of item(s) quoted for, with the existing plant & machinery i) Normal ii) Maximum.	
11.	Details of the arrangement for quality control of products such as laboratory, testing equipments etc.	
12.	Details of the staff :- i) Details of the technical supervisory staff in charge of production & quality control ii) Skilled labour employed. iii) Unskilled labour employed iv) Maximum number of worker (skilled and unskilled) employed on any day during the 18 months preceding the date of Bid	
13.	Whether Goods are tested to any standard specification. If no copies or original test certificates should be submitted in triplicate	

.....

SIGNATURE AND SEAL OF THE MANUFACTURER

(सुरेश कुमार)
(SURESH KUMAR)
उप सचिव
Deputy Secretary
गृह मंत्रालय
Ministry of Home Affairs
भारत सरकार, नई दिल्ली
Govt. of India, N. Delhi

APPENDIX-14

TENDER ACCEPTANCE LETTER
(To be given on Company Letter Head)

Date:

To,

_____

Sub: Acceptance of Terms & Conditions of Tender.
Tender Reference No: _____
Name of Tender / Work: -

_____

Dear Sir,

1. I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely: _____ as per your advertisement, given in the above mentioned website(s).

2. I/ We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like annexure(s), schedule(s), etc .), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.
3. I/We here by certify that I/we visited the site before quoting and understood the scope of work and site conditions.

4. The corrigendum(s) issued from time to time by your department/ organisation too have also been taken into consideration, while submitting this acceptance letter.

5. I/ We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.

6. I/ We do hereby declare that our Firm has not been blacklisted/ debarred by any Govt. Department/Public sector undertaking.

7. I/ We certify that all information furnished by the our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organisation shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.

Yours faithfully,

(Signature of the Bidder, with Official Seal)

APPENDIX-15

MANUFACTURER'S/PRINCIPAL'S AUTHORISATION FORM

To

.....
DM Division, Ministry of Home Affairs
.....
New Delhi – 110 011.

Sir,

Tender: _____,

We, _____who are established and reputable manufacturers of _____,having factory at _____and _____,hereby authorize M/s _____(name and address of agent) to bid, negotiate and conclude the contract with you against Tender No _____ for the above goods manufactured by authorized us. No company or firm or individual other than M/s _____are authorised to bid, negotiate and conclude the contract in regard to this business against this specific tender.

We undertake to provide necessary software, software updates/patches for the supplied goods for free of cost.

We hereby extend our full guarantee and warranty as per the conditions of tender for the goods offered for supply against this tender by the above firm.

The authorisation is valid up to _____

Yours faithfully,

(Name)

For and on behalf of M/s
(Name of manufacturers)/Principal.

(सुरेश कुमार)
(SURESH KUMAR)
उप सचिव
Deputy Secretary
गृह मंत्रालय
Ministry of Home Affairs
भारत सरकार, नई दिल्ली
Govt. of India, N