Volume - I

सत्ये स्थितो धर्मः

NATIONAL LAW UNIVERSITY,ODISHA
KATHAJODI CAMPUS
CUTTACK

NOTICE INVITING TENDER FOR INTERIOR & FURNISHING WORK OF NATIONAL LAW UNIVERSITY CAMPUS WORKS

NAME OF THE WORK : **INTERIOR & FURNISHING WORK OF ADMINISTRATIVE BLOCK FOR NATIONAL LAW UNIVERSITY ODISHA**

PLACE OF SUBMISSION OF THE TENDER PAPER : **At the office of the The Vice Chancellor National Law University Odisha . Kathajodi Campus, Cuttack - 753015, ODISHA**

ARCHITECT/PMC:
M/S. RATH ARCHITECTONIC
PLOT NO. 104, MADHUSUDAN NAGAR
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SECTION - I

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NOTICE INVITING TENDER

National Law University Odisha invites sealed Short tender from the contractor on item rate basis for the execution of Interior & Furnishing work for Administrative Buildings of proposed National Law University Campus at Kathajodi Campus, Cuttack-753015, Odisha. Details of Tenders are as under.

a. Name of the work : **Interior & furnishing work**, **Heating Ventilating Air Conditionings System**, **Fire fighting System**, **WI-Fi and LAN Networking System**, **Public Addressable System ,Video Conferencing System for the Administrative Building**, National Law University, Odisha Campus.

b. Time allowed for completion : Work 75 days for the total work from the date of issue of LOI.

Brief division of work will be done as follows :

Interior & furnishing work

Time period to be fixed 75 days for Interior & Furnishing work as per the following phase of work to be completed.

Note: - For detail of block of Administrative buildings, Please refer Tendered Drawings

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(I) INTERIOR FURNISHING AND FINISHING WORK :

c.	Earnest money deposit	:	Rs. 8,00,000.00 (Rupees Eight lakhs only)
d.	Security deposit	:	5% of the contract value
e.	Cost of tender document	:	Rs. 10,000.00 + 5 % Odisha VAT = Rs. 10,500.00 (Rupees ten thousand Five Hundred only) ,DD (Demand Draft) in favor of "**The Registrar, National Law University Odisha.** payable at Cuttack.
f.	Sale of Tender Document	:	20.02.2015 to 11.03.2015
g.	Last date & time of receipt of Tender	:	11.03.2015 at 3:00P.M.
h.	Pre bid meeting		03.03.2015, at NLUO, Naraj Site at 11:30A.M.
i.	Address at which the Tenders are to be submitted	:	The Vice Chancellor. National Law University Odisha . Kathajodi Campus, Cuttack-753015, ODISHA
j.	Date & time of opening of Tenders		11.03.2015 at 04:00P.M.
k.	Place of opening Tender:		At the office of the **The Vice Chancellor** National Law University Odisha. Kathajodi Campus, Cuttack-753015, ODISHA
l.	Validity of offer.		75 days from the date of handing over the site.

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m.	Liquidated Damages.	1% of the estimated contract value shown in the Tender per week subject to a maximum of 5% of the accepted tendered amount.

In case the date of opening of Tender is declared as a holiday , the Tenders will be opened on the next working day at the same time.

National Law University Odisha has the right to accept / reject any / all Tenders without assigning any reasons.

For and behalf of National Law University Odisha .

Technical Bid Criteria

Reputed contractor who has successfully ongoing / completed similar works may apply on or before 31.01.2015 their Tender can only be opened.

1. Basic criteria for pre-qualification of contractor:

   a. Intending contractor should have minimum 7 years experience in that same field.
   b. Intending contractor should have successfully completed one similar type of works in for Government/PSUs/ CPWD/PWD (State), / Corporate reputed corporate etc. during last seven years.
   c. Intending contractor should have successfully completed similar type of works as under as on 31.03.2014 for Government/PSUs/ CPWD/PWD (State)/ reputed corporate etc. during last three years. :

   i. One similar works costing not less than Rs.**6.00 Crores** , Two similar works each costing not less than Rs. **4.0 Crores** Or, Three similar work each costing less than Rs. **3.0 Crores** in last five years.

   Similar work means:- Interior works, furnishing, HVAC (VRF Technology),Video Conference System, Electrical work, Fire Fighting works, LAN and Wi-Fi system.

   d. Annual turnover of the tenderer during last three financial years(2011-2012, 2012-2013 and 2013-2014) should be at least Rs. **6. 00 Crores** in one of the year or the total turnover in last 3 financial years as mentioned should be minimum **12 Cores.** (Rupees Twelve crores only)

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e. Intending contractor must have sufficient man power with experienced personnel, technical knowhow, Technical expertise, establishment, plant/equipment to complete the project well in time.

All the prescribed formats duly filled in with all necessary particulars as required there under along with attested copies of certificates/credentials in proof of the particulars filled on shall be submitted in a sealed cover super-scribed "Prequalification of contractor for Interior furnishing and finishing work of Administrative Building of NLUO Campus at Naraj" on or before 03:00 P.M on dt: 11.03.2015 at the Office of **The Vice Chancellor, National Law University Odisha, Kathajodi Campus, Cuttack-753015, ODISHA.**

3. Selection will be made based on particulars and documents furnished by the applicant as required and satisfactory verification carried out by the PMC / NLUO. Incomplete information in the application will lead to summary rejection. If any information furnished by the applicant is found incorrect at a later stage, they shall be liable to be debarred from Tender / taking up the work. NLUO reserves the right to verify the particulars furnished by the applicant independently.

4. Issue of Tender documents to the contractor will be restricted to those considered eligible from the applicant and no further press notice in this regard will be issued. NLUO reserves the right to accept or reject any or all applications without assigning any reasons whatsoever.

5. For any other clarifications, intending agencies may contact at the office of The **The Registrar, National Law University Odisha** in above mentioned address before the last date of submission during working hours as mentioned above.

6. Incomplete applications and applications not filled properly with requisite details are liable for rejection and NLUO will not entertain any further communication in such cases.

7. The NLUO reserves the right to accept or reject any or all applications without assigning any reasons whatsoever.

8. Pre-bid meeting with all contractor shall be held at NLUO site at Cuttack, on dt 03.03.2015 at 11:30 AM. at **National Law University Odisha, Kathajodi Campus, Cuttack-753015, ODISHA** at Cuttack, wherein contractor can clarify any doubts /discrepancies in documents Tendered Drawings , and indicate only missing or any item taken extra in the description of item, Tendered Drawings or any details conveying different meaning at different places, other missing details or any missing item in Tendered Drawings / Specifications / Conditions. All queries needs to be put up in writing to

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the " The Vice Chancellor, NLUO, Cuttack. No further clarifications shall be given by NLUO and contractor shall not claim any extra payment in future. Also contractor shall not be entitled for any claim on such issues at later date.

All the queries should be brought out during the Pre-bid meeting only in writing, on which the compliance to be made by NLUO against the agency quires shall be annexed as a part of tender.

All the queries shall deliberated and corrective action if any shall be taken during the Pre- Bid meeting.

Any addendum thus issued shall be part of the bidding documents and shall be notified in the website www.nluo.ac.in.

9. No interest shall be paid on Earnest Money Deposit and Retention money or any other securities.
10. The contractor should have executed similar works as an integrated project which includes interior work along with HVAC(VRF Technology),firefighting system LAN and Wi-Fi system.

TENDERS SHOULD BE SUBMITTED AS FOLLOWS :

1. Tenders are to be submitted on the printed forms issued by NLUO. The contractor should quote the rates in figures as well as in words. Special care should be taken to write the rates in figures in such a way that interpolation is not possible. The total amount should be written both in figures and in words . In case of figures, the words . "Rs" should be written before the figure of rupees and words "p" after the decimal figures e.g. Rs. 2.15 "p" and in case of words, the word "Rupees" should precede and the word "Paise" should be written at the end, Unless the rate is in whole rupees and followed by the words "only" it should invariably be upto two decimal places . While quoting the rate in schedule of quantities , the words "Only" should be written closely following the amount and it should not be written in the next line. The amount of each item shall be worked out and the requisite total shall be given. All corrections shall be attested by the initials of the Tenderers . In case of any discrepancy / difference, the rate quoted in words in the original copy of the Tender and the amount derived there from shall prevail and be binding . If the rates in words are not written, the Tender will be rejected.

2. Tenders which should be placed in sealed cover with the name of the project and date of opening of Tenders written on the envelopes will be received by the office of the Vice Chancellor**,** National Law University Odisha, Kathajodi Campus, Cuttack-753015, ODISHA Upto 11.03.2015 at 03:00 P.M. in a sealed envelope of appropriate size containing the documents as under:

3. ENVELOPE MARKED "PART-A"

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Envelope marked “PART-A” shall contain the following Documents :

a. Forwarding letter without mentioning the cost of the Tender value arrived at with quoted rates.

b. Earnest money deposit furnished in the form of Crossed demand Draft / Banker’s cheque drawn in favor of “The Registrar, NATIONAL LAW UNIVERSITY ODISHA ” and payable at Cuttack for the amount indicated in the Tender Call Notice.

c. Any comment which the Tenderer desires to make in the form of a statement as brief as possible and with reference to the items.

d. Latest three years attested photocopies of upto date Income Tax and Sales tax Clearance Certificate.

e. The term and conditions which are of commercial and technical nature if any as per the conformation in the pre bid meeting to be enclosed as annexure – “PB”

f. Any other papers the Tenderers wishes to submit towards qualification.

g. Class contractor submission of documents showing:

1. Nature and names of the firm.
2. Previous project done with documentary support.

4. ENVELOPE MARKED “PART-B”

Envelope marked” PART-B” shall contain the Priced Tender in duplicate –Marked “ORIGINAL” & “DUPLICATE”, on the body of the Tender paper issued Non compliance of this provision may result in rejection of the Tender .

5. ENVELOPE MARKED “PART-C”.

Envelope marked No-PART “A” & “B” shall be put in large envelope of adequate size marked “PART-C” which shall be properly sealed. This envelope, which shall be, endorsed on the outside face **“TENDER CALL NOTICE FOR INTERIOR**

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AND FURNISHING WORK OF ADMINSTRATIVE BUILDING FOR NATIONAL LAW UNIVERSITY CAMPUS WORKS AT KATHAJODI CAMPUS, CUTTACK-753015, ODISHA".

Outer envelope (Marked "PART-C") containing the separate Tender documents as mentioned herein above shall be opened in the office of the The Vice Chancellor, National Law University Odisha , Kathajodi Campus, Cuttack-753015, ODISHA. on 11.03.2015 at 04:00P.M in the presence of the representatives of the PMC and of those tenderers who chose to remain present.

Envelope "PART-A" containing earnest money deposit shall be opened first and0 if the Earnest money deposit is not found as prescribed in the Tender the same shall be rejected and other sealed envelope will be returned unopened to the representatives of the concerned Tender if present. Then the covering letter without mentioning the Tender amount arrived from the quoted rates and other documents as specified herein above will be scrutinized and comments/conditions which has financial implication will be evaluated and the same may be discussed with the Tenderers if required so.

The date of opening of Envelope "PART-B" containing the priced Tender in original and duplicate will be intimated to the qualified bidders for attending the same with date and time by NLUO.

The acceptance of the tender will be made by the N.L.U.O., N.L.U.O will announce the name of the contractor whose Tender is accepted. No reason will be given for acceptance / rejection of the Tenders.

The Vice Chancellor
National Law University Odisha
Kathajodi Campus, Cuttack-753015, ODISHA

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SECTION - II

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ANNEXURE -I

PARTICULARS OF THE FORM TO BE FURNISHED FOR THE PURPOSE OF PRE-QUALIFICATION OF CONTRACTOR

1) Name of the Organization :

2) Address :

3) Year of Establishment :

4) Status of the firm :
(Whether Company/Firm/Proprietary) :

5) Name of Director/Proprietor :

i)

ii)

iii)

6) Whether registered with the register of Companies/ Registrar of Firms. If so, mention number and date.

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7) a) Name and address of Bankers.

i) ii)
iii) iv)

b) Enclose Solvency Certificate from the Bankers.

c) Furnish the details of NPA or dispute with Bankers, if any.

8) Whether registered for sales tax purposes. If so, mention number and date. Furnish also copies of sales tax clearance certificate.

9) Whether an assesses of Income Tax. If so, mention permanent account number.

10) Furnish copies of audited Balance Sheet and Profit & Loss Account (Audited) for the last three years i.e., as on 31.03.12, 31.03.13 & 31.03.14.

11) If you are registered in the panel of other Organizations/Statutory Bodies, such as CPWD, PWD.MES, Banks etc., furnish their names, category and date of registration.

i) ii)

iii) iv)

v) vi)

12) Detailed description and value of works done during last 7 years
(As per Performa – 1 in a separate sheet)

13) Specify turnover in last 3 years. In Rs. Crores

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2013-14
2012-13
2011-12

14) Furnish the names with address of three responsible persons who will be in a position to certify about the quality as well as past performance of your organization.

i)

ii)

iii)

15) Furnish the details of the litigation, if any, with the employers.

16) Other relevant information (As per Performa – 2 & 3)

It is certified that the information furnished is authentic. We understand that the Bank reserves the right to reject any or all applications without assigning any reasons thereof.

Date:

(Signature of the applicant)
Including title & capacity
In which application is made with seal.

Place:

Note: Where copies are required to be furnished these is to certified copies preferably by the concerned agencies or a Government Officer.

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Enclosure to Annexure I

PROFORMA – 1

PARTICULARS IN RESPECT OF WORKS EXECUTED DURING LAST 7 YEARS (See the note below)

Sl No	Name of work/Project with Address	Short Description of work Executed	Name & Address of Owner	Value of Work Executed	Stipulated time of Completion With date of commencement	Actual time of Completion with date of completion	Name of Architect/ Consulting Engineer with Phone & Mobile no.
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Note: Attested copies of work completion certificates issued by the employer to be enclosed for verification by the NLUO/PMC.

Name and Signature with Seal

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Enclosure to Annexure I

PROFORMA – 2

KEY PERSONNEL PERMANENTLY EMPLOYED.

Sl No.	Name	Designation	Qualification	Experience	Years With the Firm	Any other
1	2	3	4	5	6	7

Name and Signature with Seal

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SECTION - III

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Enclosure to Annexure I

ARTICLES OF AGREEMENT

(Subject to Approval by NLUO)

This agreement is made on the _____ day of _____2015 between "NATIONAL LAW UNIVERSITY ODISHA" represented by its VICE CHANCELLOR _____ (hereinafter called "NLUO") which expression shall include their representatives, executors, administrators and assignees of the ONE PART AND M/s _____ a Company registered under Companies Act of 1956 having its registered office at _____ represented by its _____(herein called "-CONTRACTOR) which expression shall include his/their heirs principle partners, executors, administrators and assignees of the OTHER PART.

WHEREAS NLUO is desirous of constructing NLUO Project at Kathajodi Campus, Cuttack-753015,, ODISHA and has caused Tendered Drawings, Specifications, terms and conditions, Description of works , etc. describing the work to be done.

AND WHEREAS the said Tendered Drawings, specifications, terms & conditions, , Description of works etc. have been signed by or on behalf of the parties here to.

AND WHEREAS THE CONTRACTOR has agreed and accepted to execute upon and subject to the conditions set forth herein and to the conditions set forth in contract conditions all of which are collectively (hereinafter referred to as "The said Conditions"), the works shown upon the said Tendered Drawings and described in the said specifications therein amounting to the sum of Rs._____ (Rupees _____) or such other sum as shall become payable hereunder (hereinafter referred as The Said Contract Amount).

AND WHEREAS THE CONTRACTOR has deposited Rs. _____ (Rupees _____) as Earnest Money for the Proposed Interior furnishing and finishing work of NLUO, to be retained with NLUO for the due performance of this Agreement.

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NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the lump sum of Rs. _____ (Rupees _____) to be paid at the time and in the manner set forth in said conditions CONTRACTOR will upon and subject to the said conditions execute and complete the works shown upon the said Tendered Drawings and such further detailed Tendered Drawings as may be furnished to them by NLUO and described in the said specifications and the said Description of works including rectification of any defect therein inconformity in all respect with the provision of the contract.

2. NLUO shall pay to CONTRACTOR they said Contract amount of Rs._____ (Rupees _____) or such other sum as shall become payable at the time and the manner hereinafter specified in the said conditions as authorized by NLUO.

3. The said Tendered Drawings, Description of works and conditions of contract and other documents herein mentioned shall form the basis of this CONTRACT , and the decision of the said NLUO as mentioned in the conditions of contract in reference to all matters of dispute as to the materials, workmanship, the intended or interpretation of the clause of this Agreement, or any other document attached hereto shall be final and binding.

4. The following documents shall be deemed to form and be read and constructed as an integral part of the Agreement. (Viz)

   (i) This form of Agreement.
   (ii) Letter of Intent _____dt. _____
   (iii) Tender schedule, Tender Call Notice, Form of Tender, Conditions of Contract, Specifications and Tender Tendered Drawings.
   (iv) Following Correspondence.
   (a) _____
   (b) _____

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and the parties hereto will respectively abide by and submit themselves to the Conditions and stipulations and perform the agreements on their parts respectively in such conditions, specifications.

5. NLUO AND THE CONTRACTOR bind themselves, and successors in interest, executors, administrators and assigns of administers and assigns of such other party in respect of all covenants of this Agreement.
6. The said contract comprise the works above mentioned and all subsidiary works connected therewith within the same site, as may be ordered to be done from time to time by the said NLUO even though such works may not be shown on the Tendered Drawings or described in the said specifications or the Description of works but may be fairly intended for Successful completion & functioning of the project. This is a fixed cost contract and no escalation is payable. Abnormal increase in the cost of materials or abnormal delay in completion of the project shall not be compensated for by escalation. It is explicitly instructed that the Interior contractor shall provide for all necessary assistances as supply of tools, machinery, materials to all and such other agencies directly engaged by NLUO in time for the execution and completion of the Works.

7. NLUO reserves to himself the right of altering the Tendered Drawings and nature of work and of adding to or omitting any items of work or of having portions of the same carried out departmentally or otherwise be carried out without prejudice to this contract and the contractor shall not be entitled to any remuneration or compensation on such work. The contractor shall not have any right to object to same.

8. The contractor shall not assign, sublet or transfer his/their interest in this agreement without the written consent of NLUO.

9. The contractor shall afford every reasonable facility to the representatives of the said NLUO for inspection, checking or otherwise to the site to enable them to find out the actual carrying out of all works in the manner laid down in the said conditions.

10. If the contractor shall fail to comply with any of his obligations hereunder or shall he wind-up or his business shall be dissolved or any receiver is appointed or any attachment is made in respect of any of his properties or the contractor shall otherwise fail or neglect to complete the said work within the stipulated period, then or on the happening of any such event the “NLUO” shall be entitled to cancel this Contract and to get the unfinished work done at the cost & risk of the contractor / by a third party & if NLUO suffers any Losses in this regard NLUO shall look to the contractor for the same viz., payment or reimbursement to such losses. The decision of the said NLUO in regard to the quantum of

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such losses will be final and binding on parties hereto. Upon such termination of this Contract or there shall be adjustment of any payment made to contractor by NLUO the sub - contractor / supplier shall, if required refund any such amounts to NLUO.

11. Time shall be considered as the essence of this CONTRACT and THE CONTRACTOR hereby agrees to commence the work in accordance with the said conditions and to complete the entire and all the works connected there to or as ordered from time to time within the time period stipulated herein and to execute the same diligently and consistently throughout the entire time period so specified and the contractor shall strictly adhere to the detailed programme for completion of work.

12. All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen in Cuttack and only the courts of Cuttack shall have jurisdiction to determine the same.

13. All payments by NLUO under CONTRACT will be made at NLUO, Office of "The Vice Chancellor" NLUO . The contractor is required to open a Bank account in the same bank as of NLUO for timely payments.

14. It is the responsibility of the contractor to ensure timely depositing of sales tax on work contract tax as per the prevailing rate during the tenure of contract period. The contractor shall be responsible for any delayed/partial payment of WCT, VAT, service Tax and all other taxes as required under statute and other prevailing laws.

15. As per Service Tax rules, applicable on Interior furnishing and finishing work , Service Tax is to be paid by the service provider (the contractor in this case). As per section of the Central Exercise act 1944, as extended to Service Tax, every person making Service Tax payments, shall be presumed to have passed on the incidence of such tax to client, availing the taxable service. Accordingly Service Tax incidence. % (Prevailing rates) has been passed. This statutory liability will be deposited by us along with each RA Bill and challan shall be submitted to NLUO on before submitting next bill, In case Service Tax rate is reduced / scrap than Service Tax loaded in the lump-sum contract value shall be reimbursed to NLUO.

16. Contractor shall provide the vouchers for full quantity of any of the material brought for the project whenever asked by NLUO and be inclusive of Service tax and VAT in the rates.

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17. The Contractor will carry out the testing of any of the materials at his own cost from a recognized laboratory as approved by NLUO as per the relevant IS Codes before it is used in the work.

18. All parts of this contract have been read to us and fully understood by us.

As witness thereof the parties hereto have hereunto set their hands the day and year first above written.

Signed by the said NLUO: _____

In the presence of witness:

Name: _____ Name: _____

Occupation : _____ Occupation : _____

Address : _____ Address : _____

Signed by the said CONTRACTOR: _____

In the presence of witness:

Name: _____ Name: _____

Occupation : _____ Occupation : _____

Address : _____ Address : _____

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SECTION - IV

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FORM OF TENDER CALL NOTICE

To

The Vice Chancellor
National Law University Odisha ,
Kathajodi Campus, Cuttack-753015,, ODISHA.

Sub : Tender for Interior furnishing and finishing work of National Law University Campus for National Law University Odisha at Kathajodi Campus, Cuttack-753015,, ODISHA.

Dear Sir,

I/We, have seen the site, read and examined and clearly understood the content in the following documents related to the Interior furnishing and finishing work of National Law University Campus for National Law University Odisha at CUTTACK, ODISHA.

a) Tender Call Notice.

b) Instruction to the Tenderers.

c) Articles of Agreement.

d) General conditions of contract.

e) Special conditions of contract.

f) Particulars specifications and special clauses forming part of schedule of quantities.

g) Tendered Drawings.

h) Modifications/Amendments to the Tender Call Notice if any.

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I/We hereby Tender for execution of the works referred to in the aforesaid document upon the terms and conditions contained or referred to there in and in accordance in all respects with the specifications, designs, Tendered Drawings and other relevant details at the rates quoted in Bill of Quantity and within the period of completion as stipulated in schedule.

In consideration of I/We being invited to Tender, I/We agree to keep the Tender open for acceptance for …… months from the due date of submission thereof and not to make any modifications in its terms and conditions which are not acceptable. A sum of Rs---------- ----------is hereby forwarded in the form of demand draft No. ---------- -----dt.---------- issued by ----------(name of Bank) as earnest money in favor of National Law University Odisha which amount is not to bear any interest. If I/We fail to keep the Tender open as aforesaid or make any modifications in the terms and conditions of the Tender which are not acceptable to National Law University Odisha , I/We agree that National Law University Odisha shall without prejudice to any other right or remedy be at liberty to forfeit the said earnest money absolutely. Should this Tender be accepted, I/We hereby agree to abide by and fulfill all the terms and conditions and provisions of the aforesaid documents.

If after the Tender is accepted, I/We fail the commence the execution the works as provided for in the terms and conditions of contract. I/We agree that National Law University Odisha shall without prejudice to any of their rights and remedies, be at liberty to forfeit the said earnest money absolutely.

Witness---------- signature in the capacity of ----------
date ---------- Duly authorize to sign the Tender on behalf of ----------
Address----------

Time ----------
Dated----------
Telephone No.----------.

(Seal)
Tender submitted on ---------- Before ---------- P.M.

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SECTION - V

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APPENDIX

1.	Name of work	:	Interior and furnishing work for the Administrative building, National Law University Campus.
2.	Location	:	At: Kathajodi Campus, Cuttack-753015,, ODISHA
3.	Scope of work	:	As above and further detailed in the General Conditions of contract.
4.	Defects Liability Period	:	12 (Twelve) months from the date of issuing of completion certificate.
5.	Date of Commencement	:	3 (Three) days from the date of issue of work order or the date of handing over site, whichever is later.
6.	Time allowed for completion	:	Work 75 days for the total work from the date of issue of LOI.

Brief the division of work will be done as follows :

INTERIOR AND FURNISHING WORK OF ADMINSTRATIVE BUILDING

Time period to be fixed 75 days for Interior & Furnishing work as per the following phase of work to be completed.

7.	Liquidated damages	:	1% of the estimated contract value shown in the tender per week subject to maximum of 5% of the accepted tender amount.
8.	Value of works for Interim certificate:		Rs. ……. subject to minimum of one bill in 15days.

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9.	Period of honoring Certificate	:	a) 15 (fifteen) days for R.A. Bills from the date of receipt of certificate from the Architect.
10.	Total Security Deposit	:	5% of the gross value of work done & claimed in each bill provided the total security deposit i.e. ISD+ retention money shall both together not exceeding 5% of the contract value or 5% of final bill whichever is more.
11.	Initial Security Deposit :		1% of the accepted contract amount which includes the EMD

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SECTION - VI

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GENERAL CONDITIONS OF CONTRACT.

1.0. **Definitions:**

"Contract means the documents forming the tender and the acceptance there of and the formal agreement executed between National Law University Odisha (client) and the contractor, together with the documents referred therein including these conditions , the specifications, designs, Tendered Drawings & instructions issued from time to time by the Architect/ N.L.U.O and all these documents taken together shall be deemed to form one contract and shall be complementary to one another.

1.1.1. In the contract the following expression shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

1.1 "N.L.U.O" shall mean National Law University Odisha (client) having it's office at Kathajodi Campus, Cuttack-753015, ODISHA. & includes the client's representatives, successors & assigns.

1.1.1(a). "PMC/ Consultant" shall mean "M/s. RATH ARCHITECTONIC", Plot No. 104, Madhuaudan Nagar, Unit-IV, Bhubaneswar-751001.

1.1.1(b). "PMC" shall mean "M/s. RATH ARCHITECTONIC", Plot No. 104, Madhuaudan Nagar, Unit-IV, Bhubaneswar-751001.

1.1.2. "Site in charge" shall mean an Engineer appointed by the N.L.U.O/PMC as their representative to give instructions to the contractor.

1.1.3. "The Contractor" shall mean the individual or firm or company whether incorporated or not, undertaking the works and shall include legal representative of such individual.

1.1.4. 'Engineer' shall mean the technical representative of the Architect/consultant.

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1.1.5. ‘Tendered Drawings’ shall mean the Tendered Drawings prepared by the PMC and then issued by the Engineer and referred to in the specifications and any modifications of such Tendered Drawings as may be issued by the Engineer from time to time ‘Contract value shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions thereto or deductions there from as may be made under the provision herein after contained.

1.1.6. ‘Specifications’ shall mean the specifications referred to in the tender and any modifications thereof as may time to time be furnished or approved by the architect consultant .
1.1.7. “Month” means calendar month.
1.1.8. “Week” means seven consecutive days.
1.1.9. “Day” means a calendar day beginning and ending at 00Hrs and 24 Hrs respectively.

2.1.0 DEFECT LIABILITY PERIOD

2.1.1 The Defect Liability Period shall commence from the date of virtual completion as mentioned in the Certificate of Virtual Completion issued by NLUO. The duration of the Defect Liability Period shall be One year after the date of issue of virtual completion certificate by NLUO to the Contractor. i.e. 15 days after all the works as per the scope of work including completion of all Interior furnishing and finishing work s are complete.

3.0 i) Letter of Acceptance

Within the validity period of the Tender the N.L.U.O shall issue a letter of acceptance either directly or through the architect by registered post or otherwise depositing at the address of the Contractor as given in the Tender to enter into a Contract for the execution of the work as per the terms of the Tender. The letter of acceptance shall constitute a binding contract between the NLUO and the contractor.

ii) Contract Agreement

On receipt of intimation of the acceptance of Tender from the NLUO/ PMC the successful tenderer shall be bound to implement the contract and within fifteen days thereof he shall sign an agreement in non judicial stamp paper of appropriate value.

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4.0 Liquidated damages:

If the contractor fails to maintain the progress required to complete the work and clear the site including vacating their office on or before the contracted or extended date or completion without justification in support of the cause of delay or

a. Delay in completion.
b. The defect which suppose to be rectified as per the advice of National Law University Odisha / Project Management Consultant within the stipulated period.
c. Non specified material.
d. Payment of labour & statutory uses. And he may be called upon without prejudice to any other right of remedy available under the law to the NLUO on account of such breach to pay a liquidated damages at the rate of 1% of the contract value which subject to a maximum of 2% of the contract value.

5.0 PAYMENT TERMS & CONDITIONS :

85% of the total R.A. Bill submitted shall be paid within 7 (seven) working days from the date of submission of R.A. Bills to NLUO with a condition that PMC/PD will certify to pay the amount. The balance payment deducting the necessary statutory dues shall be paid only after complete verification of Bill by Project Management Consultant & National Law University Odisha. The rest payment will be made after verification of the bill with in 15days.

6.0 PERFORMANCE GUARANTEE :

The performance guarantee is 5% of the total contract value which is submitted in form of Bank Guarantee from a Nationalized Bank. Which is valid for 12 (twelve) months beyond the completion period which will be submitted with in the 7 days from the date of agreement as per the Performa enclose.

7.0 Settlement of disputes and Arbitration.

h. Except where otherwise provided in the contract all questions and disputes relating to own connection with the interpretation, execution or enforcement of the contract shall be refer to arbitration, abolition and conciliation Act 1996.

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ii thing whatsoever in any way arising out of or relating to the contract, designs, Tendered Drawings, specifications, estimates, instructions orders or these conditions or otherwise concerning the work or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter.

If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Architect or incase the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the contractor shall give notice in writing of his claim, or dispute to the **Vice Chancellor,** National Law University Odisha, Kathajodi Campus, Cuttack-753015, ODISHA and endorse a copy of the same to the PMC, within 30 (thirty) days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and contractor shall not be entitled to raise any claim nor shall the N.L.U.O be any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to the **Vice Chancellor,** National Law University Odisha, Kathajodi Campus, Cuttack-753015, ODISHA in the manner and within the time as aforesaid. The contractor shall be deemed to have waved and extinguished all his rights in respect of any claim not notified to the **Vice Chancellor,** National Law University Odisha, Kathajodi Campus, Cuttack-753015, ODISHA in writing in the manner and within the time aforesaid.

ii) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the N.L.U.O shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the **Vice Chancellor,** National Law University Odisha, Kathajodi Campus, Cuttack-753015, ODISHA. It will also be no objection to any such appointment that the arbitrator so appointed is a N.L.U.O Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as N.L.U.O Officer. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said, **Vice Chancellor,** National Law University Odisha, Kathajodi Campus, Cuttack – 753015, ODISHA. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party involving arbitration shall give a list of disputes with amounts claimed in respect of each disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.

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It is also a term of this contract that no person other than a person appointed by such National Law University Odisha, Kathajodi Campus, Cuttack – 753015, ODISHA as aforesaid should act as arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the arbitration & Conciliation Act 1996 or any statutory modification or reenactment thereof and the rules made there under.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall , if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof, shall be paid and fix or settle the amount of costs to be so paid.

8.0 **INTERIM PENALTY**

8.1 The time allowed for carrying out the work as entered in the tender shall be strictly observed by the Contractor and shall be deemed to be of the essence of the contract on the part of the contractor and shall be reckoned from the 3rd day after the date on which the order to commence the work is issued to the Contractor or the date of handing over of site whichever is later.

8.2 The work shall throughout the stipulated period of the contract be proceeded with all due diligence. Before commencing the work, the Contractor shall submit a detailed programme of work prepared in accordance with the aforesaid time schedule (Bar Chart), to the PMC, Project Director for approval. Upon NLUO's acceptance of the same, the Contractor shall proceed with the work with all the diligence and regularity. The work programme shall be verified on the first working day of each month by the Project Director, and in case it is not adhered to in any item of work stated therein, or the agreed programme remains uncommented, incomplete, or delayed, the Contactor shall be liable to pay compensation for interim delay, an amount of. Rs. 10,000 per day.

8.3 This amount shall be recovered from each interim bill of the Contractor, the deductions thus made being refunded only upon the Contractor making good the delay to bring the work in agreement with the detailed programme of work. However, if in the

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opinion of the NLUO, the delay (in any particular item of work in the whole) is of a minor nature only, and occurring due to reason beyond control, the amount so being withheld may be waived by NLUO at his sole discretion. Provided always that the entire amount withheld shall stand forfeited if the entire project is not completed by the due date or extended date of completion.

9. Total Security Deposit

Total Security deposit comprises of
Earnest money deposit
Initial Security deposit
Retention Money.

a) Earnest Money Deposit.

a. The tenderers will submit the earnest money of Rs 8,00,000.00 (Rupees Eight lakhs Only) in the form of Demand draft.

b. EMD in any other form other than as specified above will not be accepted. Tender not accompanied by the EMD is liable to be rejected.

c. No interest will be paid on the EMD.

d. EMD of unsuccessful tenderers will be refunded within 15 days of award of contract.

e. EMD of successful tenderer will be retained as a part of security deposit.

b) Initial Security Deposit (ISD)

The amount of ISD shall be 1% of accepted value of tender including the EMD in the form of D/D drawn on any Nationalized Bank and shall be deposited within 3 (three) days from the date of acceptance of tender.

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b) Retention Money

Besides the ISD as deposited by the contractor in the above said manner, the retention money shall be deducted from the running account bills at the rate of 5% of the gross value of work done by the contractor and claimed in each such bill provided that the total security deposit i.e. the ISD plus Retention Money both taken together shall not exceed 5% of the contract value. Provided further that in the event, the cumulative gross value of work done exceeds the accepted value of tender, total security deposit shall not exceed 5% of such gross value. 50% of the total security deposit shall be refunded to the contractor without any interest on issue of Virtual Completion certificate by the Architect/consultant. The balance 50% of the total security deposit shall be refunded to the contractor without interest within fifteen days after the end of defects liability period provided the contractor has satisfactorily attended to all defects in accordance with the conditions of contract including site clearance.

Earnest Money Deposit.

f. The tenderers will submit the earnest money of Rs 8,00,000.00 (Rupees Eight lakhs Only)in the form of Demand draft.

g. EMD in any other form other than as specified above will not be accepted. Tender not accompanied by the EMD is liable to be rejected.

h. No interest will be paid on the EMD.

i. EMD of unsuccessful tenderers will be refunded within 15 days of award of contract.

j. EMD of successful tenderer will be retained as a part of security deposit.

10.0. Refund of Security Deposit.

10.1. No interest shall be paid on the amount retained by the N.L.U.O as Security Deposit.

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10.2. 50% of the total security deposit shall be refunded to the contractor without any interest on issue of Virtual Completion certificate by the Architect/consultant. The balance 50% of the total security deposit shall be refunded to the contractor without interest within fifteen days after the end of defects liability period provided that the contractor has satisfactorily attended to all defects in accordance with the conditions of contract including site clearance.

11.0 Signing of the Contract Document.

The Successful tenderer shall be bound to implement the contract by signing an agreement and condition of contract attached herewith within 3 days from the receipt of intimation of acceptance of his tender by the N.L.U.O. However, the written acceptance of the tender by the N.L.U.O will constitute a binding agreement between the N.L.U.O and successful tenderer whether such formal agreement is subsequently entered into or not.

12.0 Validity of Tender.

Tender shall remain valid and open for acceptance for a period of three (3) months from the date of opening of price bid. If the tenderer withdraws his/her offer during the validity period or makes modifications in his/her original offer which are not acceptable to the N.L.U.O without prejudice to any other right or remedy the N.L.U.O shall be at liberty to forfeit the EMD.

13. Ownership of Tendered Drawings

All Tendered Drawings, specifications and copies thereof furnished by the NLUO through its architects / consultants are the properties of the NATIONAL LAW UNIVERSITY, ODISHA. They are not to be used for any work.

14. Insurance of works

14.1 Without limiting his obligations and responsibilities under the contract the contractor shall insure the insurance is being covered in the joint names of the NLUO and the contractor against all loss of damages from whatever cause arising other than the excepted risks, for which he is responsible under the terms of contract and in such a manner that the NLUO and contractor are covered for the period stipulated and are

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also covered during the period of maintenance for loss or damage arising for a clause, occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the contractor in the course of any operations carried out by him for the purpose of complying with his obligations under clause.

a) The works for the time being executed to the estimated current Contract value thereof, or such additional sum as may be specified together with the materials for incorporation in the works at their replacement value.

b) The constructional plant and other things brought on to the site by the contractor to the replacement value of such constructional plant and other things.

c) Such insurance shall be effected with an insurer and in terms approved by the NLUO which approval shall not be unreasonably withheld and the contractor shall whenever required produce to the PMC/ Consultant the police if insurance and the receipts for payment of the current premiums.

14.2 Damage to persons and property

The contractor shall, except if and so far as the contract provides otherwise indemnify the NLUO against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the works and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation of damages for or with respect to :

a) The permanent use or occupation of land by or any part thereof.

b) The right of NLUO to execute the works or any part thereof on, over, under, in or through any lands.

c) Injuries or damages to persons or properties which are unavoidable result of the execution or maintenance of the works in accordance with the contract.

d) Injuries or damage to persons or property resulting from any act or neglect of the NLUO their agents, employees or other contractors not being employed by the contractor or for or in respect of any clams,

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proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the NATIONAL LAW UNIVERSITY, ODISHA, employees, or agents or other contractors for the damage of injury.

15. Third Party Insurance

15.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clauses 24.0 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of NATIONAL LAW UNIVERSITY, ODISHA, or to any person, including any employee of the NATIONAL LAW UNIVERSITY, ODISHA, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the mattes referred to in the provision to clause 24.0 thereof.

15.2 Minimum amount of Third Party Insurance

Such insurance shall be effected with an insurer and in terms approved by the NLUO which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required produce to the PMC/ Consultant the policy or polices of insurance cover and receipts for payment of the current premiums.

The minimum insurance cover for physical property, injury, and death is Rs.5.00 lakhs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessary to make insurance valid for four occurrences always.

15.3 Accident or Injury to workman:

The NLUO shall not be liable for in respect of any damages or compensation payable at law respect or in consequence of any accident or injury or any workmen or other person in the employment of the contractor or any sub-contractor, save and except an accident or injury resulting from any act or default of the NLUO against all such damages and compensation, save and expect as aforesaid, and against all such damages and

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compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof in relation thereto.

15.4. Insurance against accidents etc. to workmen

The contractor shall insure against such liability with an insurer approved by the NLUO during the whole of the time that any persons are employed by him on the work and shall, when required, produce to the PMC/ Consultant such police of insurance and receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-contractor the contractor's obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub contractor shall have insured against the liability in respect of such be persons in such manner that NLUO is indemnified under the policy but the contractor shall require

such require sub-contractor to produce to the PMC/ Consultant when such policy of insurance and the receipt for the payment of the current premium.

15.5 Remedy on contractor's failure to insure:

If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case the NLUO may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the NLUO as aforesaid from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

15.6 Without prejudice to the others rights of the NLUO against contractors. In respect of such default, the NLUO shall be entitled to deduced from any sums payable to the contractor the amount of any damages costs, charges and other expenses paid by the NLUO and which are payable by the contractors under this clause. The contractor shall upon settlement by the Insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with due diligence to rebuild or repair the works destroyed or damaged, In this event all the monies received from the Insurer in respect of such damage shall be paid to the contractor and the Contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged.

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16.0 Commencement of Works:

The date of commencement of the work will be reckoned as the date of handing over site by joint signature of contractor, PMC & NLUO or three days from the date of issue of letter of acceptance of the tender by the NLUO whichever is later.

17.0 Time for completion

Time is essence of the contract and shall be strictly observed by the contractor. The Work shall be completed within a period of 120 calendar days from the date of commencement work. If required in the contract or as directed by the Architect/ consultant. The contractor shall complete certain portions of work before completion of the entire work. However the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

18.0. No compensation or restrictions of work

If at any time after acceptance of the tender NLUO shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not required the whole or any part of the work to be carried out. The Architect/PMC/ shall give notice in writing to that effect to the contractor and the contractor shall act accordingly. In the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work fully but which he did not derive in consequence of the foreclosure of the whole or part of the work.

Provided that the contractor shall be paid the charges on the materials carried only actually and confide brought to the site of the work by the contractor and rendered surplus as a result of the abandonment, curtailment of the work or any portion thereof and then taken back by the contractor, provided however that the NLUO shall have in such cases the option of taking over all or any such materials at their purchase price or a local current rate whichever is less.

"In case of such stores credit shall be given to him at the rates not exceeding those at which were originally issued to the contractor after taking into consideration and deduction for claims on account of any

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deterioration or damage while in the custody of the contractor and in this respect the decision of PMC/ Consultant shall be final.

19.0 Suspension of work

i) The contractor shall, on receipt of the order in writing of the PMC/ Consultant (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as PMC/ Consultant may consider necessary so; as not to cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons.

a) On account any default on the part of the contractor, or

b) For proper execution of the works or part thereof for reasons other than the default of the contractor, or

c) for safety of the works or part thereof.

The contractor shall, during such suspension properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the PMC/ Consultant.

ii) If the suspension is ordered for reasons b) and c) in sub – Para I) above:

The contractor shall be entitles to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account.

20.0 Action when the whole security deposit is forfeited

In any case in which under any clause or clauses of this contract, the Contractor by the PMC/ Consultant shall have the power to adopt any of the following course as they may deem best suited to the interest of the NATIONAL LAW UNIVERSITY, ODISHA..

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a) To rescind the contract (of which rescission notice in writing to the contractor by the PMC/ Consultant shall be conclusive evidence) and in which case the security deposit of the contractor shall be forfeited and be absolutely at the disposal of NATIONAL LAW UNIVERSITY, ODISHA.

b) To employ labour paid by the NLUO and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and materials (the cost of such labour and materials as worked out by the PMC/ Consultant shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried ;out by the contractor under the terms of this contract the certificate of PMC/ Consultant as to the value of work done shall be final and conclusive against the contractor.

c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess the certificates in writing of the PMC/ Consultant shall be final and conclusive) shall be borne by original contractor and may be deducted from any money due to him by NLUO under the contract or otherwise, or from his security deposit o the proceed of sale thereof, or sufficient part thereof. In the event of any of above courses being adopted by the NLUO the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any material or entered into any engagements or make any advances on account of, or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescind under the provision aforesaid, the contractor shall not be entitled to recover or to be paid any sum or any work thereto for actually performed under this contract, unless, and until the PMC/ Consultant will have certified in writing the performance of such work and the value payable in respect thereof, and he shall only be entitled to be paid the value so certified.

21.0 NLUO has right to terminate the contract

If the contractor being an individual or a firm commit any ‘Act of insolvency’ or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Govt. and of the Official Assignee of the liquidator in such acts of insolvency of winding up shall be unable within seven days after notice to him to do so, to show to the reasonable

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satisfaction of the PMC/ Consultant that he is able to carry out and fulfill the contract, and to give security therefore if so required by the PMC/ Consultant.

Or, if the contractor (whether an individual firm or incorporated company) shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or, shall assign or sublet this contract without the consent in writing of the NLUO through the Architect/ consultant or shall charge or encumber this contract or any payment due to which may become due to the contractor there under :

(a) has abandoned the contract; Or

(b) has failed to commence the work, or has without any lawful excuse under these conditions suspended the progress of the works for 14 (fourteen) days after receiving from the NLUO through the Architect/ Consultant written notice to proceed, or

I has failed to proceed with the works with such diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon. Or has failed to remove materials from the site or to pull down and replace work within seven days after written notice from the NLUO through Architect/ PMC that the said materials were condemned and reject by the PMC under these conditions. Or has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contactor to observe or perform the same or has to the detriment of good workmanship or in defiance of the NLUO‘s or Architect’s

Consultant’s instruction to the contrary subject any part of the contract. Then and in any of said cases the NLUO and or the Architect/ consultant , may not withstanding any previous waiver, after giving seven days notice in writing to the contractor determine the contract, but without thereby affecting the powers of the NLUO or the Architect/ consultant or the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been so determined and as if the works subsequently had been executed by or on behalf of the contractor. And further the NLUO through the Architect/ Consultant

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their agents or employees may enter upon and take possession of the work and all plants, tools, scaffoldings, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads use the same by means of their own employees or workmen in carrying on and completing the work or by engaging any other contractor or persons to complete the work and the contractor shall not in any was interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for completing and finishing or using the materials and plants for the work.

When the works shall be completed or as soon thereafter as convenient the NLUO or the Architect/ consultant shall give a notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within 14 days after receipt thereof by him the NLUO sell the same by public auction after due publication, and shall adjust the amount realized by such auction. The contractor shall have no right to question any of the act of the NLUO incidental to the sale of the materials etc.

22.0 PAYMENT TERMS & CONDITIONS :

85% of the total R.A. Bill submitted shall be paid within 7 (Seven) working days from the date of submission of R.A. Bills to NLUO subject to condition that PMC/PD(I/c) will certify to Pay the amount. The balance payment deducting the necessary statutory dues shall be paid only after complete verification of Bill by National Law University Odisha / Project Management Consultant within 15 days.

24.0 Excise duty, taxes, levies etc.

The contractor shall pay and be responsible for payment of all taxes, duties, levies, royalties, fees, cess or charges in respect of the works including but not limited to sales tax, tax on works contract excise duty, and octroi, payable in respect of materials, equipment plant and other things required for the contact. All of the aforesaid taxes, duties, levies, fees and charges shall be to the contractor's account and the NLUO shall not be required to pay any additional or extra amount on this account. Variation of taxes, duties, fees levies etc if any, till completion of work shall be deemed to be included in the quoted rates and no extra amount on this account. Variation of taxes, duties, levies etc, if any, till completion of work shall be deemed to be included in the quoted rates and no extra claim on this account will in any case be entertained. If a new tax

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or duty or levy or cess or royalty or octroi is imposed under as statue or law during the currency of contract the same shall be borne by the contractor.

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SECTION - VII

NLUO
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PMC
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SPECIAL CONDITIONS OF CONTRACT

Scope of work

1.0 The scope of work is to carry out all works in connections with Construction Interior and furnishing works of National Law University Campus Works at Kathajodi Campus, Cuttack-753015, ODISHA.

2.0 Address of site

The site is located at Kathajodi Campus, Cuttack-753015, ODISHA.

3.0 Dimensions and levels

All dimensions and levels shown on the Tendered Drawing shall be verified by the contractor on the site and he will be held responsible for the accuracy and maintenance of all the dimensions and the levels. Figured dimensions are in all cases to accepted and no dimension shall be scaled. Large scale details shall take precedence over small-scale Tendered Drawings. In case of discrepancy the contractor shall ask for clarification from the PMC/ Consultant before proceeding with the work.

4.0 Notice of operation

The contractor shall not carry out any important operation without the Consent in writhing from the PMC/ Consultant/NLUO

5.0 Approved make

The contractor shall provide all materials from the list of approved makes and ISI marked at his own cost and also appoint the agency for the waterproofing, anti-termite, aluminium doors ,etc. and any other item as

NLUO SIGNATURE AND SEAL | PMC SIGNATURE AND SEAL | CONTRACTOR SIGNATURE AND SEAL

specified in the Tender . The PMC/ Consultant may approve any make / agency within the approved as given at the time of Tender list as given in the Tender after inspection of the sample / mock up. The contractor will approve the makes from PMC minimum 30 working days before executing the works.

6.0 Procurement of materials

The contractor shall make his own arrangements to procure all required materials and ISI marked for the work. All wastages and losses in weight shall be to the contractor account.

7.0 Acceptance of Tender

The NLUO shall have the right to reject any or all Tenders without assigning any reason. They are not to bound to accept the lowest or any Tender and the Tenderer or Tenderers shall have no right to question the act of the NATIONAL LAW UNIVERSITY, ODISHA. However adequate transparency would be maintained by the NATIONAL LAW UNIVERSITY, ODISHA.

8.0 The Bidders must send offers only in the Tender document collected from the office of NLUO accepting the term & conditions mentioned and should enclose this tender document duly signed and stamped in each page along with their offer both in figures and words along with their acceptance of the terms &conditions of NLUO otherwise the offer will be summarily rejected.

9.0 Information regarding Tendered Drawings and designs can be obtained from office of the Architect , At – Plot No. 104, Madhusudan Nagar, Unit –IV, Bhubaneswar-751001. Ph. No. 0674-2390940,

10. In case of any changes in design as per the site condition the Tendered Drawing shall supersede the B.O.Q enclosed the tender.

11. One year AMC(Annual Maintenance Contract) shall be taken by the contractor at his own cost for Air-conditioning, Firefighting, Water cooler, Water purifier , Furniture ,Wi-fi system, LAN networking, public address system,. The AMC date will be considered from the date of handing over of site to NLUO.

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12. The warranty given by the manufacturing company on any material to be used at site by the contractor shall be in the name of the "Vice Chancellor National Law University, Odisha".

13. The contractor should study the Tendered Drawings properly and visit the site for analyzing the site condition before quoting the rates.

14. During AMC Period , the contractor will repair the defective materials within 24 Hrs after getting complain from NLUO. If the contractor fails to repair the same then NLUO will recover 5times the amount required for repairing the material from the contractor.

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SECTION - VIII

NLUO
SIGNATURE AND SEAL

PMC
SIGNATURE AND SEAL

CONTRACTOR
SIGNATURE AND SEAL

PROFORMA OF LETTER OF ACCEPTANCE OF TENDER

REGISTERED A.D.

To,
M/s …….
…….
…….
Dear Sirs,

NAME OF THE WORK

Please refer to your letter No. _____ dated _____ on the captioned subject. We are pleased to inform that your Tender for the above mentioned work has been accepted by our clients NLUO at the rates quoted by you for a total cost of Rs._____ (Rupees _____)

In this connection, it may please be noted that the following letters will form part of the contract document:

i) Your letter No. _____ dated _____ addressed to _____
ii)
iii)
iv)

You are requested to call on us to execute the formal agreement within 05 days from the date of issue of this letter of acceptance or the date of handing over the site whichever is later.

You are requested to submit Initial Security Deposit of Rs._____ by means of DD drawn in favor NLUO within a period of 7 days from the date of issue of this letter.

NLUO	PMC	CONTRACTOR
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You are also requested to start the work at once in consultation with PMC/NLUO. Please note that the time allowed for completion of work is 75 days, which shall be reckoned from 3rd day of receipt of this letter or date of handing over the site whichever is later.

Please note that time will be the essence of the contract.

You are further requested to take out necessary insurance covers, indemnity bonds, labour permissions at your cost in terms and conditions of the contract.

Please acknowledge receipt of this letter.
Architects

COPY to Vice Chancellor of NLUO , for information.

Place :…….
Date :……..

NLUO	PMC	CONTRACTOR
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SECTION - IX

NLUO SIGNATURE AND SEAL | PMC SIGNATURE AND SEAL | CONTRACTOR SIGNATURE AND SEAL

PERFORMANCE BANK GUARANTEE

1. Whereas the NLUO and M/s ……(herein after referred to as contractor) have come to and agreement for construction of Interior Furnishing & Finishing Work of Administrative block for NLUO, vide letter no. NLUO/Wks/……..dated……..

2. And whereas, as per the terms of the contract executed the contractor is to furnish performance BG for…….(5% for contract value) valid up to Virtual Completion Certificate (12 months).

NOW THEREFORE THESE WITNESS

3. We (Name of the Bank) (herein after referred to as the Bank) in consideration of NLUO, having agreed to pay the contractor at rates as provided in the agreement executed between them, hereby agree with NLUO.

4. We……..(Bank) do hereby undertake to pay the amount due and payable under this guarantee without any Demur, merely on a demand from Board, stating that the amount claimed is due by way a loss or damage caused to or would be caused to or suffered by the NLUO, by reason or any breach by the said agreement or by reason of the contractor's failure to perform the said agreement. Any such demand made on the Bank, shall be conclusive as regards the amount due and payable by the Bank, under this guarantee. However, our liability under this BG shall be restricted for any amount not exceeding value of this BG.

5. We……..(Bank) further agree that the guarantee herein contained, shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till NLUO certifies that the Terms & Condition of the said agreement has been full and properly carried out by the said contractor and accordingly

NLUO	PMC	CONTRACTOR
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discharged the guarantee. The Bank understood that the Onus of extending the validity of BG in time, as per the requirement of NLUO is with the contractor.

6. That it will, in the event of the contractor, failing to honor any of the conditions stipulated in its agreement OR in the event of the contractor not completing the work as per specification and Tendered Drawing, or in the event of the contactor committing breach of the contract or any provision these off or in the event of the contact failing to renew this guarantee, at any time during the course of contract and settlement of account including the period covered by its extension, pay to NLUO without any Demur on mere demand by D.G. NLUO, the sum or Sums which in the opinion of the Vice Chancellor. NLUO, the contactor is liable to pay NLUO. Any such demand made on the Bank, shall be conclusive as regards, the amount due and payable by the Bank under the guarantee. However our liability under the BG shall be restricted to an amount not exceeding Rs……

7. We…….(Bank) further agree with NLUO that the NLUO shall have the fullest liberty without effecting in any manner our obligation here under to vary any of the Terms & Condition of the said agreement or to extend time of performance by the contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the NLUO against the said contractor and to forbear or enforce any of the Terms & Condition relating to the said agreement and we shall not to the relieved from our liability by reasons of any such variation or extension, being granted to the said contractor or for any forbearance , act or omission on the part of NLUO or any indulgence by NLUO to the said contractor or by any such matter or thing, whatsoever which under law relating to sureties would but this provision have effect of so reliving us. We ……..undertake not to revoke this guarantee during its currency except with the previous consent of the NLUO in writing.

8. That as to whether occasion has arisen for the demand of the amount covered by BG, the decision of Vice Chancellor, shall be final and accepted by the Bank without any reference to the contractor.

9. That this BG, shall be enforceable against the Bank as a first charge and not available to be appropriated by the Bank towards claims, if any due, to the contractor. That to give effect to the guarantee, the Vice Chancellor NLUO shall be at liability to act as, though the Bank were the principal debtors.

10. NLUO's rights to recover the said amount will not be affected or compounded due to any dispute raised by Contractor or to that any dispute is pending before any officer, Courts, Arbitrator/Umpire. This BGB shall in all respects and for all purpose be binding and operative till the validity including extended period. If required, NLUO may ask for extension of this period of BGB during its validity. In case the period of BGB is not extended by the Bank on receiving the intimation from NLUO then

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the letter of extension shall be treated as non-encashment of BGB and the Bank shall remit the amount to NLUO. For enforcing legal rights/remedies under this BGB the Courts of High court, Cuttack jurisdiction.

11. And that the Bank shall not revoke the BG during its currency except with the previous consent in writing of the Vice Chancellor, NLUO and agree that any change in the constitution of the said contractor or said Bank shall not discharge our liability hereunder. This BGB shall in all respect and for all-purpose be binding and operative till the validity including extended period. It shall not be necessary for the NLUO to proceed against the contractor before proceeding against the Bank and the guarantee herein contained shall be enforceable against the Bank notwithstanding any security, which the Board may have obtained from the contractor.

12. That this BG shall be enforceable against the Bank or a first change and not available to be appropriated by the Bank towards claim, if any due to the contractor. That forgive effect for the guarantee the Vice Chancellor, NLUO shall beat liability to act as though the Bank were the principal debtors.

13. That this BG shall be in full force for a period of twelve months from _____ and it will hold goods for all demands make by Vice Chancellor, NLUO.

NLUO SIGNATURE AND SEAL | PMC SIGNATURE AND SEAL | CONTRACTOR SIGNATURE AND SEAL

SECTION - X

NLUO SIGNATURE AND SEAL | PMC SIGNATURE AND SEAL | CONTRACTOR SIGNATURE AND SEAL

LETTER OF GUARANTEE FOR MOBILISATION ADVANCE
(TO BE STAMPED AS A SECURITY BOND)

The Vice Chancellor
National Law University Odisha .
kathajodi Campus
Cuttack - 753015, ODISHA

Dear Sirs,

N.L.U.O's Proposed National Law University Campus Works at Kathajodi Campus, Cuttack-753015,.

WHEREAS

(1) You have awarded a contract for civil work in respect of the construction of your N.L.U.O's own National Law University Campus Works at Kathajodi Campus, Cuttack-753015 to our constituents _____a Company / firm having its registered office/office at _____ (hereinafter referred to as "the Contractors", which expression shall include its successors and assigns) in terms of which the National Law University Odisha has agreed to advance to the contractors a sum of Rs. _____ (Rupees _____ only) as and by way of mobilization advance in order to enable them for making arrangements for producing necessary materials for the construction work and for tools, plant, equipment, etc.

(2) The Contractors have vide their letter dated _____ requested the National Law University Odisha to grant them a sum of Rs. _____ (Rupees _____ only) as and by way of mobilization advance which the National Law University Odisha has agreed to grant subject to the terms and conditions as set out in their letter No. _____ dated _____.

(3) One of the terms of the said letter dated _____ requires the Contractors to furnish bank guarantee satisfactory to the National Law University Odisha to secure the said advance.

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(4) It is agreed by and between the parties to the said contract that the said bank guarantee may be furnished by us.

NOW THEREFORE THIS LETTER OF GUARANTEE WITNESSES that in consideration of the National Law University Odisha on our request agreeing to advance a sum of Rs. _____ (Rupees _____ only) as a and by way of mobilization advance subject to the terms and conditions as set out in the National Law University ODISHA 's letter No. _____ dated _____ addressed to the Contractor, we the (Name of bank) hereby agree and undertake to the National Law University ODISHA as follows:

(i) that the Contractors shall duly perform and discharge their obligations under the said contract to the full satisfaction of the National Law University ODISHA and that they shall utilize the said mobilization advance exclusively for the purpose of making preliminary construction of the aforesaid project for the National Law University Odisha at Kathajodi Campus, Cuttack-753015, and for no other purpose.

(ii) that in case the Contractors do not repay principal amount or pay the interest on said advance on the due dates or do not present their Running Bills for payment to the National Law University Odisha so that the National Law University Odisha is not in a position to adjust the said advance from out of the bills payable to the contractors or the contractors fail to repay the said advance or pay interest thereon or any part thereof on due dates or on demand, by the National Law University Odisha or on the occurrence of any of the events specified in the said contract that may lead to the termination of the contract, we the (Name of the bank) hereby guarantee and undertake to pay to the National Law University Odisha on demand without demur the said sum of Rs._____ (Rupees _____ only) or such unadjusted portion thereof together with interest @ _____ % per annum accrued due thereon within a period of one week from the date of receipt of the demand from the National Law University Odisha .

(iii) that any statement made by the National Law University Odisha and the amount mentioned in the demand notice given to us shall not be called in question by us and shall be a conclusive proof regarding the amount that is payable by us under this guarantee and that we shall not demand any proof thereof.

(iv) that we will make the payment pursuant to the demand notice issued by the National Law University Odisha , notwithstanding any dispute that may exist or arise between the National Law University Odisha and the Contractors or any other person.

(v) that this guarantee shall not be revoked by us without prior consent in writing of the National Law University Odisha .

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WE HEREBY FURTHER AGREE THAT:

(a) any forbearance, act or omission on the part of the National Law University Odisha in enforcing any of the conditions of the said contract or granting of any time or the showing of any indulgence by the National Law University Odisha to contractors in respect of the completion of the building or any other matter in connection therewith shall not discharge us in any way and our obligations under this guarantee shall be discharged only by payment in full of the sums guaranteed hereunder.

(b) Our liability under these presents shall not exceed the sum of Rs. _____ (Rupees _____ only) and interest @ _____% per annum accruing due thereon.

(c) Our liability under this guarantee shall not be affected by any infirmity or irregularity on the part of the contractors in entering into the said contract or by the dissolution or change in the constitution of the contractor firm.

(d) Our liability under these presents will terminate on the issue of the Virtual

Completion Certificate by the Architects/N.L.U.O pursuant to the said contract and unless a claim, suit or action is filed against us within 6 months thereafter all the rights of the National Law University Odisha against us under this guarantee shall be

forfeited and we shall be released and discharged from all our obligations and liabilities hereunder.

Yours faithfully,
For and on behalf of
(National Law University Odisha)
(Authorized Official)

N.B.: This guarantee will require stamp duty as applicable in the state, where it is executed and shall be signed by the official whose signature and authority shall be verified.

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MOBILISATION ADVANCE

At the request of the Contractor mobilization advance to a maximum of 10.0 % (Ten Percent) of the contract amount against Bank Guarantee from a Nationalized Bank shall be paid by NLUO . This shall be paid in two equal installments against equivalent Bank Guarantee . The First Installment of mobilization advance of 5 % (five percent) of contract value shall be paid at the time of award of work and on certification of proper and satisfactory mobilization at site. Balance mobilization advance of 5% (five) of contracts value against Bank Guarantee bonds from Nationalized Bank shall be payable after submitting the 1st RA bill. However the first installment of mobilization advance will be released on the finalization of bar chart duly approved by NLUO and signed by the Contractor, and Project Director, receipt of certificate from Project Director and Architect/ PMC regarding satisfactory mobilization at site.

RECOVERY OF MOBILISATION ADVANCE

Total mobilization advance shall be recovered from the RA bills In Pro-rata basis when the work done value reaches 15% of the contract value till the work done value reaches 85% of the contract value.

Certificate of Payment

The contractor shall be entitled under the certificates to be issued by the NLUO to the contractor within 10 working days from the date of certificate to the payment from NLUO from time to time . The NLUO shall recover the statutory recoveries other dues including the retention amount from the certificate of payment.

The scrutiny committee can verify as and when required after verified by PMC.

Provided always that the issue of any certificate by the Architect/ consultant during the progress of works or completion shall not have effect as certificate of satisfaction or relive the contractor from his liability under clause.

The PMC/Consultant shall have power to withhold the certificate if the work or any part thereof is not carried out to their satisfaction.

The PMC/ Consultant may be any certificate make any correction required in previous certificate.

The NLUO shall modify the certificate of payment as issued by the Architect/ consultant from time to time while making the payment.

NLUO SIGNATURE AND SEAL | PMC SIGNATURE AND SEAL | CONTRACTOR SIGNATURE AND SEAL

The contractor shall submit interim bills only after taking actual measurement and properly recorded in the measurement Book.

The contractor shall not submit interim bills when the approximate value of work done by him less than **50 lacs** and the minimum interval between two such bills shall be fifteen days.

The final bill may be submitted by contractor within a period of one month from the date of virtual completion and Architect/ Consultant shall issue the certificate of payment within a period of two months. The NLUO shall pay the amount within a period of three months from the date of issue of certificate provided there is no dispute in respect of rates and quantities.

The contractor shall submit the interim bills in the prescribed format with all details.

PAYMENT TERMS & CONDITIONS :

Upto 85% of the total R.A. Bill submitted may be paid within 9 (nine) working days from the date of submission of R.A. Bills subject to the approval of PMC & PD jointly. The balance payment deducting the necessary statutory dues shall be paid only after complete verification of Bill by National Law University ODISHA / Project Management Consultant.

PERFORMANCE GUARANTEE :

The performance guarantee is 10% of the total contractor value which is submitted in form of Bank Guarantee from a Nationalized Bank. Which is valid for 12 (twelve) months beyond the completion period which will be submitted with in the 15 days from the date of agreement as per the Performa enclosed.

39.0 Settlement of disputes and Arbitration.

i. Except where otherwise provided in the contract all questions and disputes relating to own connection with the interpretation, execution or enforcement of the contract shall be refer to arbitration, abolition and conciliation Act 1996

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ii Thing whatsoever in any way arising out of or relating to the contract, designs, Tendered Drawings, specifications, estimates, instructions orders or these conditions or otherwise concerning the work or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter.

If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Architect or incase the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the contractor shall forthwith give notice in writing of his claim, or dispute to the **Vice Chancellor,** National Law University ODISHA, Kathajodi Campus, Cuttack-753015, ODISHA and endorse a copy of the same to the Architect, within 30 (thirty) days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and contractor shall not be entitled to raise any claim nor shall the N.L.U.O be any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to the **Vice Chancellor,** National Law University ODISHA, kathajodi Campus, Cuttack - 753015, ODISHA in the manner and within the time as aforesaid. The contractor shall be deemed to have waved and extinguished all his rights in respect of any claim not notified to the **Vice Chancellor,** National Law University ODISHA, kathajodi Campus, Cuttack - 753015, ODISHA in writing in the manner and within the time aforesaid.

ii) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the N.L.U.O shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the **Vice Chancellor,** National Law University ODISHA kathajodi Campus, Cuttack - 753015, ODISHA. It will also be no objection to any such appointment that the arbitrator so appointed is a N.L.U.O Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as N.L.U.O Officer. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said, **Vice Chancellor,** National Law University Odisha, kathajodi Campus, Cuttack - 753015, ODISHA. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.

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It is also a term of this contract that no person other than a person appointed by such National Law University Odisha, kathajodi Campus, Cuttack - 753015, ODISHA as aforesaid should act as arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the arbitration & Conciliation Act 1996 or any statutory modification or reenactment thereof and the rules made there under.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall , if required to be paid

before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof, shall be paid and fix or settle the amount of costs to be so paid.

NOTWITHSTANDING ANY THING CONTAINED HEREIN

1. Our liability under the Bank Guarantee shall not exceed Rs……..(Rs……..)

2. This Bank Guarantee shall be extended on receipt of letter for extension without getting confirmation from the contractor.

3. We are liable to pay the guaranteed amount or any part thereof, under this BG, only if you serve upon us a written claim or demand within six months from the date of expiry of the guarantee or extended date of expiry of this guarantee, all our liability under this BG shall stands discharged.

In witness whereof, we the undersigned official of the Bank who is /are duly authorized in this behalf as per the rules of the Bank, hereby set my/our hand and seal to this ……day of …..

NLUO	PMC	CONTRACTOR
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SECTION - XI

NLUO SIGNATURE AND SEAL | PMC SIGNATURE AND SEAL | CONTRACTOR SIGNATURE AND SEAL

PROFORMA OF MEASUREMENT BOOK

1st page:

NATIONAL LAW UNIVERSITY ODISHA

…….office,

Measurement Book No.

(Pages 1 to …….)

This book is issued to Shri…….

Signature of Vice Chancellor , NLUO

Certified that this book contains……pages

Signature of the official

To whom the book is issued

MEASUREMENT BOOK

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PAGES NOS. 1 TO ……

Item No.	Description	Measurements. No. L B D/H	Quantity	Remarks

Site Engineer NLUO . Architect/Consultant. Contractor

Checking/Test checking Engineer Date of checking/Test checking

NOTE:
Checking and test checking pertains to items wherever initialed.

NLUO PMC CONTRACTOR
SIGNATURE AND SEAL SIGNATURE AND SEAL SIGNATURE AND SEAL

I – RUNNING A/C BILL

i) Name of Contractor/Agency :

ii) Name of work :

iii) Sr. No. of this bill :

iv) No. and date of previous bill :

v) Reference to Agreement No. :

vi) Date of written order to commerce :

vii) Date of completion as per agreement :

Sl. no.	Item Description	Unit	Rate (Rs.)	As per tender Qty. Amount (Rs.)
1	2	3	4	5

Up to previous R/A Bill Qt. Amount (Rs.)	Up to date (Gross) Qty. Amount (Rs.)	Present Bill Qty. Amount (Rs.)	Remark
6	7	8	9

Note: 1) If part rate is allowed for any item, it should be indicated with reasons for allowing such a rate.

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2. If adhoc payment is made, it should be mentioned Net value since previous Bill specifically.

C E R T I F I C A T E

The measurements on the basis of which the above entries for the Running Bill No.____ were made have been taken jointly on _____
and are recorded at pages_____ to _____of measurement book No._____.

_____	_____	_____
Signature and date of Contractor	Signature and date of PMC	Signature and date of site engineer.

The work recorded in the above-mentioned measurements has been done at the site satisfactorily as per tender Tendered Drawings, conditions and specifications.

Architect/Consultant. Site Engineer/ N.L.U.O's Engineer

NLUO SIGNATURE AND SEAL	PMC SIGNATURE AND SEAL	CONTRACTOR SIGNATURE AND SEAL

SECTION - XII

NLUO SIGNATURE AND SEAL | PMC SIGNATURE AND SEAL | CONTRACTOR SIGNATURE AND SEAL

MEMORANDUM FOR PAYMENT

R. BILL No. _____

1.	Total amount due since previous bill (D) (A+B)*	Rs._____
2.	DEDUCTIONS:	
(i)	Secured advance paid in the previous R.A. bill	Rs._____
(ii)	Retention money on value of works as per accepted tenders : upto date amount	Rs._____
	Less : Already recovered	(-) Rs._____
	Balance to be recovered	Rs._____
		Rs._____
(iii	Mobilization advance, if any	
(a)	Outstanding amount (Principal + interest) as on date	Rs._____
(b)	To be recovered in this bill	Rs._____
(iv)	Any other departmental material cost to be recovered as per contract, if any	Rs._____
(v)	Any other departmental service charges to be recovered if any, as per contract (water, power etc.) Enclose statement	Rs._____
	Total deduction as per contractor	Rs._____ (-)
		Rs._____
	Net amount payable as per contract (E-F)	Rs._____ (G)

(Rupees …….) in words

The bill amounting to …… (both figures and words) has been checked after due test check of the measurement of works as required and is recommended for payment.

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Dated signature of N.L.U.O's Engineer
In charge of the project

STATUTORY DEDUCTIONS:

1.	Total amount due (E)	Rs._____
2.	Less : Income Tax payable	Rs._____
	NET PAYABLE :	Rs._____

The figure given in the Memorandum for Payment has been verified and the bill passed for payment …….. (words and figures).

Date : ……..

_____
Signature of NLUO Officer

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SECTION - XIII

NLUO
SIGNATURE AND SEAL

PMC
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CONTRACTOR
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INTERIOR AND FURNISHING WORKS

NOTE: **IN ALL CASES THE TENDERED DRAWINGS/DETAIL TENDERED DRAWINGS SHALL SUPERSEDE THE B.O.Q.**

ALL WORKING TENDERED DRAWINGS SHALL BE SUBMITTED AT THE TIME OF EXECUTION OF WORK.

TECHNICAL SPECIFICATION OF MATERIALS

1. Materials shall be of the approved quality best obtainable. A list of materials of approved brand and manufacturer is indicated in the annexure. Testing of materials of approved brand may have to be done at the decision of Architect & NLUO.
   In case, some reason or other materials are required to be obtained from any manufacturer other than those listed, then prior approval from Architects/NLUO will be necessary supported by relevant test certificates qualifying the required standard. Further tests as directed by the N.L.U.O/Architect's Engineer shall also be carried out by the supplier at their own cost, if required.
2. Sample of all materials shall be got approved by Employee/Architect before placing order & the approved sample shall be carefully preserved in an appropriate manner at the site office for verification from time to time.
3. For standard bought out item, the size manufactured by the firms listed shall prevail when there is discrepancy in the size mentioned in the schedule without any financial adjustment.
4. It shall be obligatory for the supplier to furnish certificate, from manufacturer or the material supplier, that the work has been carried out by using their material and as per their recommendations.

CARPENTARY AND JOINERY WORKS

1. FRAME :

Door/ Windows frames shall have cut rebates. Planted rebates unless shown in Tendered Drawing shall not be permitted.

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All fully fabricated timber shall be air- seasoned at site for about two months to allow for any shrinkage that may take place. As such it is desirable that the fabrication of frames is started with the commencement of the project work.
The faces of frames or any timber coming in contact with masonry or concrete or embedded in ground shall be treated with hot tar primer or crested before they are placed in position. A translucent glass shall be fixed with the chowkath above the door shutter .
Supplying and fixing Sal wood in Single rebate frames of doors, and other frames, wrought framed of 125 mm x 62 mm size including all fittings and fixed in position with anchor fastener of 150 mm long 3 nos. on each side, including grooves and making arrangement as shown on Tendered Drawing, anti-termite paint to be provided on surfaces touching masonry or concrete etc. complete.
Aluminum sections for fabricating frame work etc. shall be of extruded sections conforming to I.S 1948, 1949 or latest edition or as per Tendered Drawings or as manufacturer by Indian Aluminum co. Ltd. or approved equivalent. The alloy used shall conform to I.S designation H.E. 9 WP of I.S. 733.

2.0 HARDWARE FITING :

The hardware fitting iron or aluminum /brass shall be obtained from approved manufacturer and invariable is ISI stamped the M.S. iron fitting are to be oxidized & aluminum fittings anodized in natural color mat satin finish even if not otherwise specified. Floor spring, SS Handle (25 x 450/200/150), SS 304 Mortice Lock – one side key and one side knob/Keyless, Dead lock, SS 304 Concealed tower bolt (8”), SS 304 Door stopper, Door silencer, SS 304 grade ball bearing hinge (5”)., and other hardware fittings for doors shall be as provided and included for in the works and of such quantities and finishes as specified by Architect & NLUO. or as in the Tendered Drawings, mostly out of stainless steel matt finish of the best quality & make as approved by the NLUO./Architect The Hardware number, size etc. shall be as per the hardware schedules shown on Tendered Drawings and the contract documents. The hinges for the door shutters shall be out of Stainless steel matt finish , each shutter having minimum three nos. of 125 mm size with ball bearing for smooth operation. All the locks of internal doors shall be of approved brand as recommended by Architect & NLUO, tower bolts stainless steel matt finish 200 x 19mm /150 x 19mm size one each fitted to the top on the inside of the doors, 100 mm long rubber bushed door stopper with steel 25mm dia. Three anchor fastner shall be fixed to each post of the door frame . The M.S. anchor fastner shall be of 150mm as required at site and shall be fixed to the frames by means of screws and not nails . The other end of the anchor fastner shall be fixed into jambs with [1:2:4] P.C.C. of dimensions as directed. M.S. sheets shall be provided and fixed on corners with screws. Whenever asked for metal fastener or bolts as directed shall be used for rough ground, framing, hangers etc.

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The rates quoted for wood and joinery work shall include the cost for all types of anchor fastner or other approved fasteners, cement grouting and fixing to frame work with screws etc all complete including materials, wastages , labour, T&P hoisting and fixing in position at all heights and depths, Supplying two coats of creosote /so lignum air seasoning of wood.

3.0 MS DOOR:

Fabrication and supply of MILD STEEL DOORS with Single Leaf outer frame made of 35x35x5 mm equal M.S L angle and shutter frame made of 25 x25 x5mm equal M.S. L angle for horizontal and vertical members and the shutter frame strengthened by stiffeners of 2 Nos. Horizontal and 3 Nos. diagonal using MS flat of size 20x5mm fully covered with 18 gauge plain M.S full sheet welded with shutter frame neatly and also fixing by welding 6 Nos. of holdfasts, 1 No. of wind appliance , 2 Nos. of tower bolts,1 No of aldrop,2 Nos of handles, fixing the shutter with 6 Nos. of hinges with outer frame of the door including painting the whole unit with two coat of best quality of red oxide primer and enamel paint of approve shade.

4.0 AUTOMATIC ALUMINIUM ROLLING SHUTTER:

Supplying, fitting and fixing of perforated rolling shutters of 1. 77 mm. 1 layer slate of Aluminum material, Perforated with honeycomb holes. Approved Make 1.HORMAAN,2.ALUTECH,3.FORMULA ONE, 4.DOVER with approved colour white / beige, Rubber insert between slates,80 mm. guide rail with brushed inserts, Internal tubular motor, Remote controlled operation as well as manual opening in case of power failure, Bottom slate with rubber, Nylon guide roller, Metal cover at the top, Manual electrical switch, Thickness => at least 1 mm., Surface treating with Powder coating and Tubular Motor, of required specification

1. Voltage => 220/230 50/60 HZ.
2. Power => 300/340 watt
3. Nominal Speed => 12 rpm.
4. Nominal torque => 80 Nm.
5. Lifting Weight => 192
6. Work time => 4 min.
7. Noise => <54
8. Insulation level => B

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9. Protection => IP 44
10. Tube Diameter => 59 mm.
11. Voltage => 1.8 KV/1S etc complete as per the given Tendered Drawing and as per the direction of Engineer-in-Charge

5.0 FLUSH DOOR:

Supplying and fixing BWR grade Flush Doors shutter 30mm thick with block wood construction and ply veneering on both side conforming to IS : 2202.

(i) 38mm thick Flush Doors shutter finished with decorative veneer :-

The Flush door shall be finished with 4mm thick decorative veneer both sides including melamine polish, groove design and 38 X 6 mm teakwood beading all round the edges etc., all complete and as per the Tendered Drawing and direction of Engineer-in-charge.

(ii) 32mm thick Flush Doors shutter partly glazed finished with decorative laminate :-

The Flush Door shutter shall be finished with 1mm thick decorative laminate of approved shade (conforming to I.S : 2046-1995) on both sides including 32 X 6 mm teakwood beading all round the edges and 6mm thick glass to be inserted as per Tendered Drawing etc., all complete as per the Tendered Drawing and direction of Engineer-in-charge. Necessary groove design to be provided as per Tendered Drawing.

(iii) 32mm thick Flush Doors shutter finished with decorative laminate :-

The Flush Door shutter shall be finished with 1mm thick decorative laminate of approved shade (conforming to I.S : 2046-1995) on both sides including 32 X 6 mm teakwood beading all round the edges as per Tendered Drawing etc., all complete as per the Tendered Drawing and direction of Engineer-in-charge. Necessary groove design to be provided as per Tendered Drawing.

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(iv) 35mm thick Flush Doors shutter finished with decorative veneer & Decorative laminate :-

The Flush door shall be finished with 1mm thick decorative laminate of approved shade (conforming to I.S : 2046-1995) on one side and 4mm thick decorative veneer on another side including melamine polish, groove design and 35 X 6 mm teakwood beading all round the edges etc., all complete and as per the Tendered Drawing and direction of Engineer-in-charge.

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The flush door shall confirm to Indian Standard Specification IS:2202(part-1).Flush door shall be obtained from the manufacturer approved by the PMC and shall be ordered on the manufacturer to sizes as called for and shall be provided with second class timber as per specifications edging, glued and nailed on all edges of the flush door as shown on Tendered Drawings.

(v) Paneled door

The teak wood Paneled door shall be made of 35mm thick style top bottom and medium rail ,panel of 16mm thick plank with necessary beading etc and surface shall be finished with melamine polish.

5.1 PLYWOOD:

Used mainly for the bodywork of furniture, shall be even or similar close grained plywood suitable for veneering, painting or bonding laminate. It will be a phenol bonded, boil water resistant and powder proof ply confirming to IS:303.

6.0 PATCH FITTING DOOR:

Supplying and fixing of 12 mm thick approved make toughened glass with etching design fixed with help of patch fitting (spider fitting) to hold the glass as per manufacturer specification all complete as per Tendered Drawing and direction of Engineer-in-charge etc.

7.0 AUTOMATIC SLIDING DOOR:

Supply and fixing of automatic sliding door operator of compliant with European standards and produced according to the guidelines for power-operated windows, doors and gates, BGR 232, the UVV and the VDE regulations. TÜV design tested, tested according to the low voltage guidelines, fulfils DIN 18650 standards. The track profile should be separate from the main profile for enabling reduction in vibration insulation. Which includes micro processor controlled drive unit, with self learning mechanism, program selector with knob, motion detector (eagle 6 radars, 02 Nos), mechanical components, toothed belt, cover profile, ST-G slimline profile suitable for glass thickness upto 10 mm, Safety Device-Light Barrier (01 Pair). Body finish : standard silver anodized

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operator profile, lock with 10 mm plain toughened glass for complete elevation - 2 moving panels. UPS of 750 VA shall be provided by others, which will give power backup of 20 min. only & if the duration of power cut to the operator is more than 30 min. then separate arrangement needs to be done for the same as automatic operator require uninterrupted stabilized power supply. The above work complete in all respect as per approved Tendered Drawings and to the satisfaction of engineer-in-charge / architect consultant.

8.0 WALL CLADDING:

Supplying and fixing of wall cladding with 12mm. ply fixed to 19mm. Block board frame of 600 x 600 mm interval surface finished with 4.0 mm thick veneer with melamine polish of approved shade and teakwood beading as per Tendered Drawing and design etc all complete as per instruction of Engineer in – charge.

Supplying and fixing of wall cladding with 12mm. ply fixed to 19mm. Block board frame of 600 x 600 mm interval surface fixed with 1mm. laminate of approved shade and teakwood beading as per Tendered Drawing and design etc as per instruction of Engineer in - charge.

9.0 METAL LAM STRIPS:

Providing & fixing metal laminate of thickness 1mm over wall cladding base with 10mm groove in between as per Tendered Drawing ,design and instruction of Engineer in - charge.

10.0 FALSE CEILING WITH GYPSUM BOARD:

(A) Providing and fixing of false ceiling of 12.5 mm. thick tapered edge gypsum board fixed to the G.I. frame work consist of angle cleats at 1200 mm. centre to centre fixed to ceiling with dash fastner with bolt to the 25 X 25 X 0.5 mm. of required length other side of the hanger fixed to G.I channel of 45 X 15 X 0.9 mm. running at 1200 mm. centre to centre with ceiling section at 450 mm. centre to centre fixed in perpendicular to the intermediate G.I channel with connection clips the perimeter channel fixed to the wall / partition with screws. The tapper edge of the gypsum board finished with recommended filler and paper tape finishes and two coats of primer with three coats of acrylic emulsion paint of approved shade (roller finish) suitable for gypsum board as per manufacturers specification and also including the coat of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed all complete as per Tendered Drawing and specification and direction of the PMC.

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(i) Plain ceiling
(ii) Drop ceiling

11.0 **FALSE CEILING WITH CALCIUM SILICATE BOARD:**

(B) Supplying and fixing of false ceiling by using 8 mm thick calcium silicate board with necessary fitting like 0.55 m G.I. channel, and necessary screws etc. all complete as per Tendered Drawing and design and as per direction of Engineer-in-charge.
(i) Plain ceiling
(ii) Drop ceiling

12.0 METAL CEILING :

Supplying and fixing of 600 x 600 mm tile ceiling made out of pre-coated G.I. sheet lay in type fix to T & L section at 600 x 600 mm grid as per Tendered Drawing and specification including labour all complete and as per the direction of Engineer-in-charge**.**

12.1 MINERAL FIBER BOARD CEILING:

Supplying and fixing of grid ceiling made out of 99 RH micro look mineral fiber board of size 600 mm x 600 mm fixed to the silhouette grid frame suspended from the ceiling with the help of GI wire etc. including labour all complete and as per the direction of Engineer-in-charge.

12.2 ACOUSTIC WALL PANELING :

Providing & fixing of ANUTONE SOUNDSOAK panel with FABRIC Wall Panels manufactured by ANUTONE ACOUSTICS Ltd or equivalent, having a nominal size of 600mm width and 1200/2400 mm long and 15mm thick. The SOUNDSOAK Panels of 15mm thick with Fabric of approved make costing not more than Rs. 800/Rmtr (Woven Fabric or Composed Fabric with 'Fire Retardant' and 'Dirt Repellent' Coating) Facing of approved color on 48 mm to 50 mm wide GI stud on 50 mm thick Synch wood supplied by Anutone. Back of the board should make 50 mm gap from the wall. (Conference Room and EVP room).

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12.3 ARMSTRONG CHANNELED WOODWORKS WALL PANELLING OF SIZE: 128X2440X16MM

Providing and Fixing Armstrong Channeled Woodworks perforated panels of width 128mm, thickness of 16mm and length 2440 mm or as required by the Architect/ approving engineer, made of a high density particle board substrate with a laminated facing as per the approved shade/ species & finish and a melamine balancing layer on the reverse side. The boards shall have a special perforation pattern where the visible surface has a **("Helmholtz" fluted perforation of 2mm width and 14mm of visible panel / 4mm width and 28mm visible panel)** each. The panels shall provide a minimum sag resistance of RH90 and a fire rating class of 1 as per Part 7 of BS 476. The edges of the panels shall be "tongue-and-grooved" to receive special clips for installation. The back of the perforated panel shall have sound absorbing non-woven acoustical fleece. The panels shall be mounted on special aluminium spines using clips provided by Armstrong and approved by the Architect/ Engineer-in-Charge.

12.4 WOODWORKS 600mm X 600mm (MICRO LOOK) EDGE TILES OF R3 PERFORATION WITH ARMSTRONG XL 15 mm EXPOSED GRID" SYSTEM

Providing & Fixing of Armstrong Wooden finishes Suspended Ceiling System with WOODWORKS (MICRO LOOK) EDGE TILES WITH ARMSTRONG XL 15 MM EXPOSED GRID. The Tile with perforation pattern R3 with approved laminate (US Maple, Royal Cherry, Maple, Dark Walnut) / Wood Veneer (Maple, Dark Bamboo, Red beech, US Cherry) finish would have an NRC of 0.5, Humidity Resistance (RH) of 90%, Fire Performance Class 1(BS - 476) in module size of 600mm x 600mm x 12mm and density of 830 Kgs/M3. The grid should be of "Armstrong" make with 15mm wide T - section flanges color white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees with a web height of 38mm and a load carrying capacity of 14 Kgs/M2. The T Sections have a Galvanizing of 90 grams per M2 and pullout strength of 100kg. Suspension system for Armstrong grid to be of Armstrong make.

13.0 ARCHITRAVE :

Supplying and fixing of 19 mm Block Board all around the door frame up to 150 mm and 250 mm, exposed surface finished with 4mm thick veneer with melamine polish and grooves as per Tendered Drawing and specification including labour all complete and as per the direction of Engineer-in-charge.

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13.1 ARCHITRAVE :

Supplying and fixing of 19 mm Block Board all around the door frame up to 150 mm and 250 mm, exposed surface finished with 1mm thick laminate and grooves as per Tendered Drawing and specification including labour all complete and as per the direction of Engineer-in-charge.

14.0 PARTITION BOARD:

Supplying and fixing of full height partition using Aluminum frame 50 mm x 25 mm as indicated in the Tendered Drawing ,intermediate, verticals runner/posts ,horizontal and shall be fixed to floor ,ceilings and walls etc. with suitable size of screws plugs and fixing 6 mm water proof ply on both side over the Aluminum frame work with screws at adequate interval and fixing both sides with 1 mm laminate (matt finish) of approved make and shade and 6 mm thick float glass to be fixed with teak wood beading wherever necessary including all materials ,labour and hardware as per Tendered Drawing and specification and direction of Engineer-in-charge.

Supplying and fixing of full height partition using Aluminum frame 50 mm x 25 mm as indicated in the Tendered Drawing ,intermediate, verticals runner/posts ,horizontal and shall be fixed to floor ,ceilings and walls etc. with suitable size of screws plugs and fixing 6 mm water proof ply on both side over the Aluminum frame work with screws at adequate interval and fixing both sides with 1 mm laminate (matt finish) of approved make and shade and(12 mm clear float glass for 1350 mm height and 5.5 mm clear float glass for 2100 mm height),75 mm x12 mm thick teak wood moulding(polished) on top of the partition including all materials ,labour and hardware as per Tendered Drawing and specification and direction of Engineer-in-charge.

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15.0 FURNITURES :

15.1(a) LINEAR WORKSTATION (2580Wx660Dx1200mmH)

Providing & Fixing panel based partition of 60mm thickness 1200 mm height with framework made of aluminum alloy extrusions. All Aluminium parts are pretreated and duly powder coated of 40-60micron thickness. All these frame work sections are fitted to each other by fasteners of 2mm thickness which is properly zinc coated for corrosion resistant. Raceway in aluminum of size 118mm ht above / below the work top as per requirement for inlaying for Electrical management and carrying the wire horizontally. Top & End Trims -The exposed vertical and horizontal faces of the frames are snap fitted with curve trims. The trims are made of aluminum extrusions of size 60x19mm(thickness 1.5mm) and are covered with Die Casted End caps on joints,2 way,3way & 4 Way caps. WIRE MANAGEMENT - Partition has concealed wire management capabilities and are engineered for responsive and safe operations of power, telecommunications and data (LAN) and has separate components for electrical, data and telephone cables having adequate capability of both the vertical and horizontal wire movements Slots/cutouts are provided on Raceways to fix all electrical and data points. Work Table: Work Table top should be made of Pre laminated particle board of 25 mm thickness Finish with One side Design Lamainte and bottom with White Balemcing. The Straight edges will be sealed with matching 2mm thick PVC Edgebanding (Rehau). Zinc coated csmall Top support brackets fixed to the partition frame support the tabletops . Pedestal Drawer Unit:- The Pedestal Unit of Dimensions 400W x 450Dx 680/710mmH, made of 18mm thick Prelamianted Particle Board . The drawer unit consists of 2 box drawer and 1 file drawer. The two drawer box is fitted with roller bottom mounted Slide for free movement. and the Bottom filing drawer will fitted with heavy duty Telescopic chanel .The unit is provided with central locking system, where in the three drawer are locked with one key. D Type of handles are provided for easy opening and closing of drawer. The drawer unit is fitted on castors for easy mobility. Key Board Trey: Plastic KBPT is made of ABS in Approved Colour & size as per avalability.CPU Trolley: Metal Cpu trolley made in 1.00 mm thick CRCA Sheet with lockable caster . In Black fimish.

(b)LINEAR WORKSTATION (1290Wx660Dx1200mmH)

Providing & Fixing panel based partition of 60mm thickness 1200 mm height with framework made of aluminium alloy extrusions. All Aluminium parts are pretreated and duly powder coated of 40-60micron thickness. All these frame work sections are fitted to each other by fasteners of 2mm thickness which is properly zinc coated for corrosion resistant. Raceway in aluminum of size 118mm ht above / below the work top as per requirement for inlaying for Electrical management and carring the wire horizontally. Top & End Trims -The exposed vertical

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and horizontal faces of the frames are snap fitted with curve trims. The trims are made of aluminum extrusions of size 60x19mm(thickness 1.5mm) and are covered with Die Casted End caps on joints,2 way,3way & 4 Way caps. WIRE MANAGEMENT - Partition has concealed wire management capabilities and are engineered for responsive and safe operations of power, telecommunications and data (LAN) and has separate components for electrical, data and telephone cables having adequate capability of both the vertical and horizontal wire movements. Slots/cutouts are provided on Raceways to fix all electrical and data points. Work Table: Work Table top should be made of Pre laminated particle board of 25 mm thickness Finish with One side Design Lamainte and bottom with White Balemcing. The Straight edges will be sealed with matching 2mm thick PVC Edgebanding (Rehau). Zinc coated csmall Top support brackets fixed to the partition frame support the tabletops . Pedestal Drawer Unit:- The Pedestal Unit of Dimensions 400W x 450Dx 680/710mmH, made of 18mm thick Prelamianted Particle Board . The drawer unit consists of 2 box drawer and 1 file drawer. The two drawer box is fitted with roller bottom mounted Slide for free movement. and the Bottom filing drawer will fitted with heavy duty Telescopic chanel .The unit is provided with central locking system, where in the three drawer are locked with one key. D Type of handles are provided for easy opening and closing of drawer. The drawer unit is fitted on castors for easy mobility.Key Board Trey: Plastic KBPT is made of ABS in Approved Colour & size as per avalability.CPU Trolley: Metal Cpu trolley made in 1.00 mm thick CRCA Sheet with lockable caster . In Black fimish.

c. 120 Deg CUBICAL

Providing & Fixing desking based workstation of System - OPTIMA-1-Desking Base Workstation. 1050mm Height. Screen is made of 25mm thick Desk Mount Screen made in aluminium frames with Soft Pin-Up Fabric. Worktop: Made of 25mm thick prelam particle board finished with straignt edge band With Flip top with Brush. Worktop is supported on MS Powder Coated Metal Understructure with Triangular Section (60x75) of thickness 1.8mm. Worktop Size: 1100Wx1100Wx 600 Dx25mmT - Lamianted Flip top of Size 450mm Width with Brush.Electricals: Horizontal Power Management will under Flip top on Metal Cable tray ,where switch plate will be mount .and vertical metal Riser for vertical wire trunkingWork Table: Work Table top should be made of Pre laminated particle board of 25 mm thickness Finish with One side Design Lamainte and bottom with White Balemcing. The Straight edges will be sealed with matching 2mm thick PVC Edgebanding (Rehau) Zinc coated csmall Top support brackets fixed to the partition frame support the tabletops . Pedestal Drawer Unit:- .The Pedestal Unit of Dimensions 400W x 450Dx 680mmH, made of 18mm thick Prelamianted Particle Board . The drawer unit consists of 2 box drawer and 1 file drawer. The two drawer box is fitted with roller bottom mounted Slide for free movement. and the Bottom filing drawer will fitted with heavy duty Telescopic chanel .The unit is provided with central locking system, where in the three drawer are locked with one key. D Type of handles are provided for easy opening and closing of drawer. The drawer unit is fitted on castors for easy mobility.Key Board Trey: Plastic KBPT is made of ABS in Approved Colour & size as per avalability.CPU Trolley: Metal Cpu trolley made in 1.00 mm thick CRCA Sheet with lockable caster . In Black fimish .

d. CURVILINEAR WORKSTATION (3160Wx1560x1200mmH)

Providing & Fixing panel based partition of 60mm thickness 1200 mm height with framework made of aluminium alloy extrusions. All Aluminium parts are pretreated and duly powder coated of 40-60micron thickness. All these frame work sections are fitted to each other by fasteners of 2mm thickness which is properly zinc coated for corrosion resistant. Raceway in aluminum of size 118mm ht above / below the work top as per requirement for inlaying for Electrical management and carring the wire horizontaly.Top & End Trims -The exposed vertical

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and horizontal faces of the frames are snap fitted with curve trims. The trims are made of aluminum extrusions of size 60x19mm(thickness 1.5mm) and are covered with Die Casted End caps on joints,2 way,3way & 4 Way caps. WIRE MANAGEMENT - Partition has concealed wire management capabilities and are engineered for responsive and safe operations of power, telecommunications and data (LAN) and has separate components for electrical, data and telephone cables having adequate capability of both the vertical and horizontal wire movements. Slots/cutouts are provided on Raceways to fix all electrical and data points. Work Table: Work Table top should be made of Pre laminated particle board of 25 mm thickness Finish with One side Design Lamainte and bottom with White Balemcing. The Straight edges will be sealed with matching 2mm thick PVC Edgebanding (Rehau). Zinc coated csmall Top support brackets fixed to the partition frame support the tabletops . Pedestal Drawer Unit:- The Pedestal Unit of Dimensions 400W x 450Dx 680/710mmH, made of 18mm thick Prelamianted Particle Board . The drawer unit consists of 2 box drawer and 1 file drawer. The two drawer box is fitted with roller bottom mounted Slide for free movement. and the Bottom filing drawer will fitted with heavy duty Telescopic chanel .The unit is provided with central locking system, where in the three drawer are locked with one key. D Type of handles are provided for easy opening and closing of drawer. The drawer unit is fitted on castors for easy mobility.Key Board Trey: Plastic KBPT is made of ABS in Approved Colour & size as per avalability.CPU Trolley: Metal Cpu trolley made in 1.00 mm thick CRCA Sheet with lockable caster . In Black fimish.

E. CONFERENCE/COUNSELING
TABLE SIZE (15600Wx2700Dx750mmH)

Providing & Fixing Conference table is to be supplied in completely knock down conditions for assembly at site. The construction of the main table shall be free standing structure constructed with the help of minifix dowels and pins.The table should have waterfall edge of particle Board shall be of Interior Grade as per IS 12406 : 2003 . The table connections have to be made in such a way that no gaps should be seen in between.The Top & gable ends shall be constructed out of 25 mm thick full round Postformed particle board finish as per approved shade. Modesty panel shall be made up of 18mm thick pre-laminated particle board finish. Prelam particle board with edge bended confirming to The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .The provision of Wire carrier shall be as per manufacturer specifications. Table shall be assembled at site in following configuration . The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

F. MEETING TABLE (3600Wx1200Dx750mmH)

Providing & Fixing Conference table of size 3600mmX 1200mmX750mm The table is to be supplied in completely knock down conditions for assembly at site. The construction of the main table shall be free standing structure constructed with the help of minifix dowels and pins. The table should be made up of 43mmThick with combinaltion of 18mm Thick particle board finished with 2mm thick PVC Edgebanding & 25mm thick Moulded MDF Board with Decopainted .MDF Board shall be of Interior Grade as per IS 12406 : 2003. The table shall be supported 36mm thick Prelamaintred gable ends and 18 mm thick modesty panel finish as per approved shade.The provision of Wire carrier

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shall be as per manufacturer specifications with flip box and Vertibrae. Table shall be assembled at site . The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications. The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II. Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

G. INTERVIEW,GROUP DISCUSSION(2700Wx900Dx750mmH)

Proving and fixing of Meeting table of size 2700mmX 900mmX750mm should have work top 25mm thick made of prelam particle board with Leg should be 18 mm thick both side Full Round Post formed. and 18mmthick Modesty panel should be 600 mm high connecting both legs .The prelam particle board used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity

H. INTERVIEW,GROUP DISCUSSION

Proving and fixing of Meeting table of size 2400mmX 900mmX750mm should have work top 50mm thick made of prelam particle board with fliptop box for ease of access to data and electrical points. Leg should be 200 mm thick and with 50 mm thick metal strip on both the sides,leg carries all data & electrical wirings , Modesty panel should be 300 mm thick connecting both legs .The prelam particle board used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II. Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications. The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II. Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

I. RECEPTION TABLE (2400Wx820Dx1000mmH)

Manufacturing, supplying and placing in position of the reception table of size 2400mmLX 820mmDX.1000H Top of the table shall be made up of 50mm Pre- laminated Particle Board as per IS IS:12823 , edges finished with 2mm PVC Lipping. It shall have counter top of 50mm thick with prelaminated particle board confirming to international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .Worktop height shall be 725mm and Counter height shall be 1035mm .Angles sustained with the arc must be 60 degree .All metal strips confirming to following :Thickness 0.20 mm – 6.0 mm Temper 1/8 Hard , 1/4 Hard, 1/2 Hard, Full Hard Surface Finish Dull/Bright/Matt/Mirror Grade D/DD/EDD/Super EDD/IF Edge Mill Edge/ Slit Edge, Thickness Tolerance +/- 0.02 mm Width Tolerance As per Specification Length Tolerance(For Sheets) - 0 mm/+2 mm Camber Tolerance 1.50 mm Max. per 1000 mm shall have dimensions 0.8mm (thick) x665mm (height) below the work surface and 0.8mm (thick) x 260mm (height) above the work surface. Legs of the desk shall be made of 18mm Pre- laminated Particle Board and height 604 mm. supportd by 50mm thick plpb gable end (side vertical panel as per image) , front and top edge of gable end cover with metal strip ,plpb modesty panel / front panel 50mm thick top edge cover with strip., counter top of table of size

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3600mmx300mmx50mm made of prelam particle board, all edges cover with 50mm thick metal strip.It should be in two parts as maximum size of board available is 8' .The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications. The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II. Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

J VICE CHANCELLOR'S CHAMBER
TABLE (2400mm X 2100mmX 750mm) :

Proving and fixing of table having an overall size of 2400mm L x 2100x 750 mm Ht with work top made of 36mm thick Prelamianted Particle Board . The main table shall have understructure having verticals leg base of 100x100 made of postlamianted MDF having Ms Powder coated Top supported Brackets.and Modesty Panel made of 18mm Prelamainted finish board with having Perforated Screen . It should have 2 nos storage unit both at side & at front made os 18mm thick Prelamianted particle board. as per Tendered Drawings & direction of Engineer in charge. The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

K. VICE CHANCELLOR'S CHAIR :
Proving and fixing of high back chair ergonomicaly designed for complete lumber support, the seat and back assembly are made of 14 mm hot pressed plywood die pressedfoam upholstery seat 40kg/m3 and back32kg/m3 covered `1mm thick leatherite and arm is aluminum die casted base made of matel chrone finesh five star base with metal i, with torsion bar mechanism. with superior Nylon-6/Ultramid -56 twin wheel castors having self lubricating properties for friction free movement. grade III gas lift. . cover fabric/leatherite tapestry, With locking arrangments.Seat depth 19" X 18.5"X21" width,back height 28" X height 24.360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for control .

L. VICE CHANCELLOR VISITORS'S CHAIR :
Proving and fixing of medium back chair ergonomicaly designed for complete lumber support, the seat and back assembly are made of 14 mm hot pressed plywood die pressedfoam upholstery seat 40kg/m3 and back32kg/m3 covered `1mm thick leatherite and arm is aluminum die casted base made of matel chrone finesh five star base with metal i, with torsion bar mechanism. with superior Nylon-6/Ultramid -56 twin wheel castors having self lubricating properties for friction free movement. cover fabric/leatherite tapestry, With locking arrangments.Seat depth 19" X 18.5"X21" width,back height 20" X height 24.360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for control .

M. P.S.'S CHAMBER
TABLE (2200mm X 1950mmX 750mm) :

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Proving and fixing of table having an overall size of 2200mm L x 1950x 750 mm Ht with work top made of 36mm thick Prelamianted Particle Board . The main table shall have understructure having verticals made of 50mm thick Prelamianted Particle Board With T Profile Alluminium Edge covering for Elegand Look. Gable Ends supported with joinery and Modesty Panel made of Prelamainted finish board . It should have a moving storage unit with 4 nos filing unit of size 800Wx500D Under Special Return Top made of 36mm thick Prelamianted Particle Board. Table should have fliptop box for electrical & data connections .Should have Alluminium profiles in front and work top with Alluminium edges. as per Tendered Drawings & direction of Engineer in charge. The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

N. P.S. / F.O. / ASST. VICE CHANCELLOR'S CHAIR :

Proving and fixing of high back chair ergonomically designed for complete lumber support, the seat and back assembly are made of 14 mm hot pressed plywood die pressedfoam upholstery seat 40kg/m3 and back32kg/m3 covered `1mm thick leatherite and arm is aluminum die casted base made of matel chrone finesh five star base with metal i, with torsion bar mechanism. with superior Nylon-6/Ultramid -56 twin wheel castors having self lubricating properties for friction free movement. grade III gas lift. . cover fabric/leatherite tapestry, With locking arrangments.Seat depth 19" X 18.5"X21" width,back height 28" X height 24.360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for control .

O. P.S. VISITORS'SCHAIR :

Providing and fixing of medium back chair ergonomicaly designed for complete lumber support, the seat and back assembly are made of 14 mm hot pressed plywood die pressedfoam upholstery seat 40kg/m3 and back32kg/m3 covered `1mm thick leatherite and arm is aluminum die casted base made of matel chrone finesh five star base with metal i, with torsion bar mechanism. with superior Nylon-6/Ultramid -56 twin wheel castors having self lubricating properties for friction free movement. cover fabric/leatherite tapestry, With locking arrangments.Seat depth 19" X 18.5"X21" width,back height 20" X height 24.360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for contro

P. V.C'S CHAMBER

TABLE (2800mm X 2200mmX 750mm) :

Providing & Fixing of the Table having an overall size of 2800mm L x 2200mm W x 750 mm Ht with work top made of 45mm thick Prelaminated particle Board. The main table shall have understructure having verticals made of 105mm thick Frame Work of Prelamianted Particle Board with Alluminium channels. finish Gable Ends supported with joinery and Modesty Panel made of18mm T PLPB finish board . It should have a moving pedestal with two drawers and 1 filing unit Special Return unit having an Overall Size 1200mm L x 600mm D x 750mm Ht. with top made of 45mm thick PLPB Finish Board. Pedestal is fixed to the underside of the Return unit top. Table should have

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fliptop box for electrical & data connections .Should have Alluminium profiles in front and work top with Alluminium edges. as per Tendered Drawings & direction of Engineer in charge. The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

Q. V.C'S CHAIR :

Providing & Fixing of high back chair ergonomicaly designed for complete lumber support, die pressed and moulded wooden arm made of teak wood and melamined,wooden five star base with metal insertion made of CRCA metal and wooden teak wood duly polished and melamined base, with torsion bar mechanism. with superior Nylon-6/Ultramid -56 twin wheel castors having self lubricating properties for friction free movement. grade III gas lift.Seat & back assembly which is made of 1.2mm rhick hot pressed die moulded plywood .The seat and back are arrested together for motion on central pivot. with polyurethane foam with 45+/2 kg/m3 and hardness + 20+/2 on hampden machine at 25% compression. cover fabric/leatherite tapestry, With locking arrangments.Seat depth 19" X 20" width,back height 26" X height 24.360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for control .

R. V.C. VISITORS'SCHAIR :

Providing & Fixing of low back visitor chair ergonomicaly designed for complete lumber support, die pressed and moulded wooden arm made of teak wood and melamined, with under structure made of CRCA metal pipe duly chrome plated .Structure made of 50mm X 25 mm thick metal CRCA.Seat & back assembly which is made of 1.2mm rhick hot pressed die moulded plywood .The seat and back are arrested together for motion on central pivot. with polyurethane foam with 45+/2 kg/m3 and hardness + 20+/2 on hampden machine at 25% compression. cover fabric/leatherite tapestry, With locking arrangments.Seat depth 19" X 20" width,back height 26" X height 24.360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for control .

S. SOFA IN V.C'S CHAMBER :

Providing and placing sofa inner frame , basic structure made of wooden frame with leatherite upholstery and leg 10 mm stainless steel 304 grade size -L 1805 X D 990 X H 825 mm sofa size 3seater- 1805mm(L)X990mm(D)X825mm(H) , seat foam density=40kg/m3 back foam density=32kg/m3

T. CABIN

TABLE (1650mm X 1650mmX 750mm) :

Providing & Fixing of table having with work top made of 25mm thick both side full round Postformed Particle Board . The main table shall have understructure having25m mthick Full round Postformed Particle Board.and Modesty Panel made of 18mm Prelamainted finish board . It should have 1 nos Mobile Pedestal unit having 2 drawer & 1 filing drawer.The Side storage unit od size 900Wx450Dx750mmHi made of 18mm thick Prelamianted Particle Board. with having Sliding Shutter. as per Tendered Drawings & direction of Engineer in charge.The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet

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stringent norms of bending strength, screw-withdrawal
strength and modulus of elasticity .

U. **SYSTEM ADMIN.TABLE (1800mm X 1650mmX 750mm) :**

Providing & Fixing of table having with work top made of 25mm thick both side full round Postformed Particle Board . The main table shall have understructure having25m mthick Full round Postformed Particle Board.and Modesty Panel made of 18mm Prelamainted finish board . It should have 1 nos Mobile Pedestal unit having 2 drawer & 1 filing drawer.The Side storage unit od size 900Wx450Dx750mmHi made of 18mm thick Prelamianted Particle Board. with having Sliding Shutter. as per Tendered Drawings & direction of Engineer in charge.The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

V. PLACEMENT DEPT.TABLE (1800mm X 1650mmX 750mm) :

Providing & Fixing of table having with work top made of 25mm thick both side full round Postformed Particle Board . The main table shall have understructure having25m mthick Full round Postformed Particle Board.and Modesty Panel made of 18mm Prelamainted finish board . It should have 1 nos Mobile Pedestal unit having 2 drawer & 1 filing drawer.The Side storage unit od size 900Wx450Dx750mmHi made of 18mm thick Prelamianted Particle Board. with having Sliding Shutter. as per Tendered Drawings & direction of Engineer in charge.The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

W. GENERAL CABIN TABLE (1500mm X 1650mmX 750mm) :

Providing & Fixing of table having with work top made of 25mm thick prelamianted Particle Board with 2m mthick PVC Edgebanded Rehau make. The main table shall have understructure having 25m mthick prelamianated Particle board .and Modesty Panel made of 18mm Prelamainted finish board . With Side Table of size 900Wx450Dx750mm H supported om gable end & Modesty panel. It should have 1 nos Mobile Pedestal unit having 2 drawer & 1 filing drawer. as per manufacturer's specifications, Tendered Drawings & direction of Engineer in charge.The Products should be tested as per BIFMA standards. The Product should have ISO-9001:2000 and ISO 14001-2004 certifications.The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity .

X. STORAGE UNIT (INCLUDING BACK UNIT) 750 mm H

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Providing & Fixing of free standing Low Height storage unit of Openable type of size 750mm H X 450 D made of 25mm thick TOP and rest will be of 18 mm thick prelam particle board ,Side ,back & Shutter will 18mm thick Prelaminated particle board(PLPB) It Should have 2/3/4 openable door shutters storage unit with adjustable having load bearing capacity of shelf should be 35 Kg .These boards should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity . All fittings are of HETTICK make.

Y . STAFF CHAIR

Providing & Fixing of GB-410 Medium back should have PP arms, chrome base, gas lift.fabic tapestry, with push back Mechanism. Chair should be ergonomically designed for proper lumber support, PU arms with metal insertion, grade-III gas lift. Fabric tapestry, The seat and back should be made up of 1.2 cm thick hot pressed moulded plywood & upholstered with leather/ fabric and with high density 45 moulded polyurethane foam, The polyurethane foam is moulded with density =45+/-2kg./m3 and hardness = 20+/-2 on Hamded machine at 25% Compress. The back form is Ergonomically designed with contoured lumbar support for extra comfort. The seat and back are arrested together for motion on central pivot. The back of chair should have Polypropylene shell on seat and back as well. The chair should have tilt Mechanism with locking mechanism. The Chair has die cast aluminum base with superior Nylon twin wheel castors having self lubricating properties for friction free movement. Seat depth 19" X 20" width, back height 22" X width20.

Z. STAFF VISITOR'S CHAIR

Providing & Fixing of GB-411 Low back should have PP arms, chrome base, gas lift.fabic tapestry, with push back Mechanism. Chair should be ergonomically designed for proper lumber support, PU arms with metal insertion, grade-III gas lift. Fabric tapestry, The seat and back should be made up of 1.2 cm thick hot pressed moulded plywood & upholstered with leather/ fabric and with high density 45 moulded polyurethane foam, The polyurethane foam is moulded with density =45+/-2kg./m3 and hardness = 20+/-2 on Hamded machine at 25% Compress. The back form is Ergonomically designed with contoured lumbar support for extra comfort. The seat and back are arrested together for motion on central pivot. The back of chair should have Polypropylene shell on seat and back as well. The chair should have tilt Mechanism with locking mechanism. The Chair has die cast aluminum base with superior Nylon twin wheel castors having self lubricating properties for friction free movement. Seat depth 19" X 20" width, back height 22" X width20.

A1.CENTER TABLE - 1 :(1200mm x 6000mm x460mm)

Providing and placing of 12 mmtampered glass top 6 mm tampered bottom glass for storage option Chrome plated understructure Passed 48 hours salt spray test Glass glass attached to the understructure via UV disc Load bearing capacity : 20 Kg of size 1200 W * 600 D * 460 H in mm

B1. CENTER TABLE - 2 :(600 mm dia)

Providing and placing of 12 mmtampered glass top 6 mm tampered bottom glass for storage option Chrome plated understructure Passed 48 hours salt spray test Glass glass attached to the understructure via UV disc Load bearing capacity : 20 Kg of size 600 mm dia * 460 H in mm

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C1. CENTER TABLE - 3 :(1200 x 600 mm) (FOR SOFA SET)

Providing and placing of Centre table should be made of Staineless steel frame confirming to Cr-Ni-Mn stainless with similar properties to A240/SUS 202 stainless steel.pipe frame shoud be size 40mmx20x1.5mm The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity . The over all size should be 4' length X 2' width.

D1. CENTER TABLE - 4 :(600 x 600 mm) (FOR SOFA SET)

Providing and placing of Centre table should be made of Staineless steel frame confirming to Cr-Ni-Mn stainless with similar properties to A240/SUS 202 stainless steel.pipe frame shoud be size 40mmx20x1.5mm The boards used should meet international standards of quality and safety, as per EN 312, type P II, E2 and Indian standards IS 3087, grade II.Should meet stringent norms of bending strength, screw-withdrawal strength and modulus of elasticity . The over all size should be 4' length X 2' width.

E1. SOFA

Providing and placing sofa inner frame , basic structure made of wooden frame with leatherite upholstery and leg stainless steel 202 grade pipe size Ø38mmx1.5mm thick and pvc shoe is used in the bottom of the frame. sofa size 2 seater- 1450mm(L)X760mm(D)X750mm(H) ,seat foam density=40kg/m3 ,back foam density=32kg/m3

F1. MEETING ROOM MAIN CHAIR

Providing and placing of high back chair should have PP arms, chrome base, gas lift.fabic tapestry, with swivel tilt Mechanism. Chair should be ergonomically designed for proper lumber support, Pp arms with metal insertion, grade-III gas lift. The seat and back should be made up of 1.2 cm thick hot pressed moulded plywood & upholstered with leather/ fabric and with high density foam, The seat foam with density =40+/-2kg./m3 and back 32kg/m3. The back form is Ergonomically designed with contoured lumbar support for extra comfort. The chair should have swivel tilt Mechanism with locking mechanism. The Chair has matel base with superior Nylon twin wheel castors having self lubricating properties for friction free movement. Seat depth 20" X 20" width, back height 30"

G1. MEETING ROOM VISITOR'S CHAIR

Providing and placing of medium back chair should have PP arms, chrome base, gas lift. leatherite tapestry, with swivel tilt Mechanism. Chair should be ergonomically designed for proper lumber support, PU arms with metal insertion, grade-III gas lift. The seat and back should be made up of 1.2 cm thick hot pressed moulded plywood & upholstered with leather/ fabric and with high density foam, The seat foam with density =40+/-2kg./m3 and back 32kg/m3. The back form is Ergonomically designed with contoured lumbar support for extra comfort. . . The chair should have swivel tilt Mechanism with locking mechanism. The Chair has matel base with superior Nylon twin wheel castors having self lubricating properties for friction free movement. Seat depth 20" X 20" width, back height 23".

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H1. MEETING ROOM MAIN CHAIR (V.C.'S MEETING ROOM)

Providing and placing of high back chair should have Pu arms chrome base, gas lift.leatherite tapestry, with swivel tilt Mechanism. Chair should be ergonomically designed for proper lumber support, Pu arms with metal base, grade-III gas lift. The seat should be made up of 1.2 cm thick hot pressed moulded plywood & upholstered with leather/ fabric and with high density foam, The seat foam with density =40+/-2kg./m3 and back 32kg/m3. The back form is Ergonomically designed with contoured lumbar support for extra comfort. The chair should have swivel tilt Mechanism with locking mechanism. The Chair has matel base with superior Nylon twin wheel castors having self lubricating properties for friction free movement. Seat depth 19" X 20" width, back height 29.5"

I1. MEETING ROOM VISITOR'S CHAIR (V.C.'S MEETING ROOM AND INTERVIEW ROOM)

Providing and placing of medium back chair should have Pu arms chrome base, gas lift.leatherite tapestry, with swivel tilt Mechanism. Chair should be ergonomically designed for proper lumber support, Pp arms with metal base grade-III gas lift. The seat should be made up of 1.2 cm thick hot pressed moulded plywood & upholstered with leather/ fabric and with high density foam, The seat foam with density =40+/-2kg./m3 and back 32kg/m3. The back form is Ergonomically designed with contoured lumbar support for extra comfort. . . The chair should have swivel tilt Mechanism with locking mechanism. The Chair has matel base with superior Nylon twin wheel castors having self lubricating properties for friction free movement. Seat depth 19" X 20" width, back height 21"

J1. COUNCELLING ROOM MAIN CHAIR

Providing and placing of high back chair ergonomicaly designed for complete lumber support, the seat and back assembly are made of 14 mm hot pressed plywood die pressedfoam upholstery seat 40kg/m3 and back32kg/m3 covered `1mm thick leatherite and arm is woodan cusion arms base made of matel chrome finesh five star base with metal i, with torsion bar mechanism. with superior Nylon-6/Ultramid -56 twin wheel castors having self lubricating properties for friction free movement. grade III gas lift. . cover fabric/leatherite tapestry, With locking arrangments.Seat depth 19.5" X 19.5" width,back height 28.5" 360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for control .

K1. COUNCELLING ROOM VISITOR'S CHAIR

Providing and placing of high back chair ergonomicaly designed for complete lumber support, the seat and back assembly are made of 14 mm hot pressed plywood die pressedfoam upholstery seat 40kg/m3 and back32kg/m3 covered `1mm thick leatherite and arm is woodan cusion arms base made of matel chrome finesh five star base with metal i, with torsion bar mechanism. with superior Nylon-6/Ultramid -56 twin wheel castors having self lubricating properties for friction free movement. grade III gas lift. . cover fabric/leatherite tapestry, With locking

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arrangments.Seat depth 19.5" X 19.5" width,back height 28.5" 360 degree revolving should have class III pnumatic system for adjustment of height .Easily accesable lever for control .

L1. FILE CABINET :

Supplying and fixing of file cabinets made of 19 mm Block Board top, vertical and shutter, and 6mm ply as back board necessary teak wood beading with melamine polish all around. The exposed surface finished with 1mm laminate and inside finished with enamel paint, including the cost of all materials,labour charges etc. complete and as per the direction of Engineer-in-charge. fixed with auto hinges,100 mm SS handle and necessary locks including the cost of all materials,labour charges etc. complete.

M1. EXAMINATION OFFICE FRONT WAITING CHAIR (3 SEATER):

Supplying and fixing of S.S. Waiting area chair with facility for three seating ,the structure made of stainless steel 202 grade meeting international standards to Cr-Ni-Mn stainless with similar properties to A240/SUS 302 stainless steel. The toughness of grade 202 at low temperatures. Tensile strength 515 MPa 74694 psi, Elastic modulus 207 GPa 30000 ksi. Multiseater should have precast die moulded arms with base frame of Stainless steel and vertical support duly powder coated and should have adjusters or levers..The seat and back should be cushioned with hi-density foam with 40 density and upholstered with leatherette. Over all size should be 1860mmL X 760mmD X 790mm H.It should have ergonomic design for comfort and should not topple.

16.0 **BACK CREDENZA WITH BOOK SHELF:**

Supplying and fixing of back credenza with book shelf made out of 19 mm block board vertically and horizontally. The exposed surface finished with 4mm thick veneer. The size of bottom unit is 4800 x 450 mm and height up to 750 mm with 19 mm block board shutter finished with 4mm veneer. The size of each top unit is 1350 x 350 and height up to 1650 from top level of credenza and two no of same size top unit shall be fixed at the top of credenza on both sides. The shutter shall be made out of 19 mm block board with 4mm veneer and 6mm float glass fixed with teakwood beading. All exposed surface finished with melamine polish, inside finished with chalk polish as specified in Tendered Drawing. The cost includes the SS auto hinges handle, magnetic catch, lock etc as per Tendered Drawing including all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the Tendered Drawing and direction of Engineer-in-charge.

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17.0 **BACK CREDENZA (2400 x 450 x 750):**

Supplying and fixing of Back credenza **(2400 x 450 x 750)**shall be made out of 19 mm B.W.R. block board and side of which is to be finished with 1 mm thick approved shade laminate on exposed surface. Five openable shutter shall be provided using 19 mm block board finished with 1mm thick laminate on front side 4 partitions inside shall be provided which shall be made out of 19mm th. Block board and all unexposed block board surface shall be finished with chalk polish as per detail Tendered Drawing etc all complete and as per direction of engineer in charge.

18. **DINING TABLE:**

Supplying and fixing of dining table with Plastic shell seat of approved make. The Coated. The table Top made of Stainless Steel brushed finish with PLB insert for durability. Easy to maintain hygiene. Tubular frames made of 50.8 x 50.8mm x 1.2mm thick powder ERW tubes at base which are welded and fixed to the Top with screws. Tubular stiffeners to be provided between the two vertical frames The tubes to be closed with plastic caps. Seats must be in Plastic Shell Seats types. Level adjustors should be provided to take care of unevenness in floor. The cost including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

19.0 STORAGE CABINET:

Supplying and fixing of storage unit made out of 19 mm Block Board and 6mm ply back, necessary teak wood beading with melamine polish all around. The exposed surface finished with 1mm laminate inside finished with enamel paint as specified in Tendered Drawing. The cost includes all SS auto hinges,handles,locks etc.materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the Tendered Drawing and direction of Engineer-in-charge

Supplying and fixing of storage unit made out of 19 mm Block Board and 6mm ply back, necessary teak wood beading with melamine polish all around. The exposed surface finished with 4mm veneer All exposed surface finished with melamine polish, inside finished with chalk polish as specified in Tendered Drawing. The cost includes the SS auto hinges handle, magnetic

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catch,lock etc as per Tendered Drawing including all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the Tendered Drawing and direction of Engineer-in-charge.

20.0 WHITE BOARD :

The White board should be made from imported ceramic enameled steel surface of porcelain enameled fused at high temperature on steel surface which has very high surface hardness and excellent abrasion resistance, scratch resistance(no ghosting) which can be used as projector screen on surface under normal usage ,which accepts magnets and high visibility from corners ,for smooth writing and effortless erasing and the cost shall be including the cost of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

21.0 NAME PLATE OVER BUILDING : (STAINLESS STEEL)

Supplying and fixing of name plates over building shall be of 3d SS 304 grade letters of base height made out of SS plate at all location and height including all material, labour, T&P royalties, taxes, wastage, transportation, installation etc. all complete. The height of letter should be 900mm and width is 800mm(appx.).

Supplying and fixing of name plates over building shall be of 3d SS 304 grade letters of base height made out of SS plate at all location and height including all material, labour, T&P royalties, taxes, wastage, transportation, installation etc. all complete. The height of letter should be 600mm and width is 475mm(appx.).

22.0 NAME PLATE OVER DOOR : (STAINLESS STEEL)

Supplying and fixing of name plates of size 100mm x 300mm over officer's and teachers chamber door shall be of specified size as per Tendered Drawing and design made out of 316 L grade matt finish stainless steel plate with single colour embosed letters which shall be fixed to the door / partition wall using 12 mm x 25 mm stainless steel stud all complete as per direction of Engineer-in-charge. The job is comprising of all material, labour, T&P royalties, taxes, wastage, transportation, installation etc. all complete.

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23.0 NAME PLATE OVER DOOR : (ACRYLIC SHEET)

Supplying and fixing of name plate of size 100mm x 300mm over class rooms, house keeping, toilet ,lift, etc. doors shall be of specified size as per Tendered Drawing and design made out of Acrylic sheet embosed with single colour letters which shall be fixed to the door / partition wall using 12 mm x 25 mm stainless steel stud all complete as per direction of Engineer-in-charge. The job is comprising of all material, labour, T&P royalties, taxes, wastage, transportation, installation etc. all complete.

24.0 WALL HUNG PAINTINGS:

(i)Supplying, fitting and fixing of wall hung abstruct/realistic canvas paintings of size(13" x 16") with acrylic colour with mount and glass and 1 1/2" fibre frame(mahogany colour) in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

(ii) Supplying, fitting and fixing of wall hung acrylic landscape, abstruct, tassar patta paintings with 2" fibre frames and glass of size(16" x 20") with acrylic colour with mount and glass and 2" fibre frame(mahogany colour) in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

(iii)Supplying, fitting and fixing of wall hung acrylic landscape, abstruct ,tassar patta paintings with 2" fibre frames and glass of size(18" x18") with acrylic colour with mount and glass and 2" fibre frame(mahogany colour) in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

(iv)Supplying, fitting and fixing of wall hung tassar paintings of size(22" x30") with acrylic paintings of corporate class and 2" fibre frame in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

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(v)Supplying, fitting and fixing of wall hung word carvings paintings of size(26" x 26") with 2" fibre frame and acrylic paintings in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

(vi)Supplying, fitting and fixing of wall hung heritage fibre paintings of size(16" x 22") with 2" fibre frame in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

(vii)Supplying, fitting and fixing of wall hung tassar paintings, acrylic paintings, word carvings of size(24" x 36") with 2" fibre frame in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

(viii)Supplying, fitting and fixing of wall hung tassar paintings, acrylic paintings, word carvings of size(24" x 48") with 2" fibre frame in specified areas all complete. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

25.FLOWER PILLARS:

(i)Supplying, fitting and fixing of wooden antique flower pillars of size (36") with artificial imported flowers. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

(ii)Supplying, fitting and fixing of laminated/ antique flower pillars of size (24") with artificial imported flowers. The rate including cost of all materials with taxes, royalties, transportation, loading, unloading, sundries, T&P, labours etc. all complete and as per the direction of Engineer-in-charge.

26.0 ROLLER BLINDS :

Supplying and fixing of roller blinds of approved colour and make at specified area made of 100% Polyster with a weight of 255g/sqm / 210g/sqm(+_5%),fabric thickness of 0.60/0.33 mm(+_0.05)in required width over windows. The hanging properties of blinder should be of excellent quality and of very high tearing strength with acrylic coating resistant to cracking and fraying ,conditionally cleanable with a damp cloth. The cost including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

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27.0 PIN UP BOARD (SOFT BOARD) :

Supplying and fixing of Pin up board of size 1875 mm x 1200 mm comprising of 6 mm thk . back Ply fixed on wall/ partition with 12 mm thk pin up board (Soft board) covered with fabric of approved co. with TW beading 1" x 1" all around finished melamine polish. The cost shall be including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

28. 0 KEY HIVE :

Supplying and fixing of KEY HIVE of size 600 mm x 450 mm made of 12mm thk plywood and finished with 1.0mm thk laminate from outside. Glass shutter with lock to be provided and inside to be finished with soft board and J hooks (1.5" c/c) fixed to it. The cost including of all materials, labours, T&P, taxes, royalities, transportation etc. all complete as per the direction of Engineer-in-charge.

29**.0 FLOWER VASE :**

Providing of metal, wooden and glass flower vase in specified areas. The cost including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

30.0 CARPET:

Providing of synthetic carpet in specified areas. The cost including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

31.0 WATER COOLER SYSTEM:

Providing and fixing of water cooler system of size 461 X461X1441 having cooling capacity 40lts/hrs, storage of 80 lts,2 taps for cold water,auto controlled temperature, Propeller type condenser Fan 230Volts avg single phase, 3m to 12m head for water,15 amps 3-pin plug for power connection, 12.7mm BSP connection for inlet of water, 25.4 and 12.7mm outlet connection for drains of approved make. The key features includes IN-SITU PUF insulation, ECO-friendly refrigerant, high efficiency heat transfer coil, Speedy drainage, stainless steel tank, trough and faucets, Adjustable parts for easy leveling, Faster cooling, Partial stainless steel(PSS),compact space saving design and food grade plastic parts.

The cost including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

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32. WATER PURIFIER SYSTEM (CAPACITY- 15Lt/Hr):

Supplying and fixing of water purifier of approved make suitable for online purification for water cooler. The purification capacity is 15 ltr/hr with twin membrane1812. The water will be purified by RO + UF + UV + TDS Control. Wall mountable with transparent cover for protection of parts. It shall be Equipped with hydrostatic tank. The cost shall be including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

33.0 GEYSER:

Supplying and fixing of Electrical storage water heater of capacity 35 ltr. of approved make, in built blue diamond glass lining technology inside the inner tank. The Electrical storage water heater must have the following features:

(i)Blue diamond glass lining technology inside the inner tank.

(ii)Glass coated element for quick heating.

(iiiSacrificing anode rods protects the tank from corrosion.

The warranty must be 4 years for heating element and 2 years for inner tank.

The cost is including of all materials, labours, T&P, taxes, royalties, transportation etc. all complete as per the direction of Engineer-in-charge.

34.TRAP DOOR

Supplying and fixing of trap door of required size made out of 9mm ply fixed to the 25x50 mm wooden frame with necessary hinges. The surface shall be finished with 1 coat putty and 2 coat enamel paint matching to the ceiling design and as per the direction of engineer in charge.

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INTERNAL PAINTING WORKS

1.1 TECHNICAL SPECIFICATION OF MATERIALS

Materials shall be of the approved quality best obtainable. A list of materials of approved brand and manufacturer is indicated in the annexure. Testing of materials of approved brand may have to be done at the decision of Architect & NLUO.

1. In case, some reason or other materials are required to be obtained from any manufacturer other than those listed, then prior approval from Architects will be necessary supported by relevant test certificates qualifying the required standard. Further tests as directed by the PMC shall also be carried out by the contractor at their own cost, if required.
2. Sample of all materials shall be got approved by NLUO/Architect before placing order & the approved sample shall be carefully preserved in an appropriate manner at the site office for verification from time to time.
3. For standard bought out item, the size manufactured by the firms listed shall prevail when there is discrepancy in the size mentioned in the schedule without any financial adjustment.
4. It shall be obligatory for the contractor to furnish certificate, from manufacturer or the material supplier, that the work has been carried out by using their material and as per their recommendations.
5. No material will be supplied by NLUO only the site will be handed over to contractor for work.
6. The contractor will have his own store of their risk and cost. NLUO/PMC is not responsible to any missing, thief of the item of the– contractor.

1.2PAINTING :

Approved paints, shall be brought to the site of work by the Contractor in their original containers in sealed condition. The materials shall be brought in at a time in adequate quantities to suffice fro the whole work or at least a fortnight's work. The empties shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from the PMC/NLUO.

Acrylic Emulsion Paint

Paint shall be of approved quality and shades Surface preparation, etc application shall be as per clause 1.4.

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Two coats of Acrylic emulsion paints shall be applied as per manufacturer's specification. The surface on finishing shall present a flat velvety smooth finish. The Sample must be approved by PMC.

Synthetic Enamel Painting

Surface preparation shall be by hand cleaning. Primer shall be zinc chromate or zinc phosphate (pigmented in alkali or phenolic medium of approved make, of minimum 38 microns dry film thickness. The coats of synthetic enamel paint of approved make, of total 100 microns DFT shall be applied as directed by the PMC. The Sample must be approved by PMC.

1.3 COMMERCIAL WORK :

Painting shall not be started until the Consultant/ Owner has inspected the items of work to be painted, satisfied himself about their proper quality and given his approval to commence the painting work. The rooms should be thoroughly swept out and the entire building cleaned up at least one day in advance of the painting work being started. The contractor will give a letter to PMC for inspection before starting the painting work and the PMC will also approve the same by letter.

1.4 PREPARATION OF SURFACE :

Preparation and application of Putty.

Putty will be prepared as under. It shall be prepared from English whiting chalk, linseed oil, white zinc and Plaster of Paris in the prop. of 7:1:2:1. However, exact proportion shall be decided as per site condition. Water, if required, can be added as per the instructions and requirements to have proper consistency and stickiness. Putty should be smooth and free from any coarse ingredient, etc.

Application of putty should be started only after approval of surface area by the Engineer. It should be applied on the whole surface to make the surface smooth. No lumps should be allowed to dry completely.

After drying, the surface should be scraped with sand/emery paper till smooth surface is obtained.

If no proper smoothness is obtained again apply primer, putty, etc. and repeat the process as mentioned above, till the surface is perfect smooth as per instructions.

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After application of first coat of putty, the surface shall be allowed to dry for 24 hours. sand papering shall then be done to give smooth surface.

Subsequent applications of putty and sand papering shall be done till the Engineer is satisfied about final surface, which should be absolutely even, leveled and smooth.

Primer application

Primer should be a chromate or zinc phosphate (pigmented in alkali or phenolic medium of approved make) or as per manufacturer's specification. These tins should be opened in presence of the Engineer. Before applying primer on the surface, its consistency must be approved by the Engineer and shall be same as specified by the manufacturer. Primer should be applied with smooth brushes on surface to cover entire surface properly. There should be no brush marks, stripes, etc. when applied on the surface. This surface should be allowed to dry at least for 24 hours before next application.

On the surface so prepared, two coats of acrylic/synthetic enamel paint of selected shade shall be applied only after inspection by the Engineer. A horizontal and vertical travel of brush together will be considered as one coat of paint. Each coat of paint shall be applied only after inspection of Engineer. No brush marks shall be visible on the surface at the end of final coat. Final surface shall be smooth, even or roller finish and uniform in colour and texture

The surface shall be thoroughly cleaned and dusted . All rust, dirt, scales, smoke and grease shall be thoroughly removed before painting is started. The prepared surface shall have received the approval of the Consultant /Owner after inspection, before painting is commenced.

APPLICATION :

Before pouring into smaller container for use, the paint shall be stirred thoroughly in the containers. When applying also, the paint shall be continuously stirred in the smaller container so that its consistency is kept uniform. If for any reasons , thinning

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is necessary in case of ready mixed paint, the brand of thinner recommended by the manufacturer or as instructed by the Consultants/ Employer shall be used.

The painting shall be laid on evenly and smoothly by means of crossing and smoothly by means of crossing and laying off , the latter in the direction of the grain of wood. The crossing & laying of consists of covering the area over with paint, brushing the surface hard for the first time over and ten brushing alternately in opposite direction, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after laying off is finished. The full process of crossing and laying off will constitute one coat. Where so stipulated the painting shall be done by spraying. Spray machine used may be (a) high pressure (small air aperture) type (b) a low pressure (large air aperture) type, depending on the nature and location of work to be carried out. Skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding a suitable thinner.

Spraying should be done only when dry condition prevails. Each coat shall be allowed to dry thoroughly and rubbed smooth before the next coat is applied. This should be facilitated by through ventilation. Each coat except the last coat, shall be lightly rubbed with sand paper or with pumice stone and cleaned off dust before the next coat is laid.
No left over paint shall be put back into the stock tins. When not in use the container shall be kept properly closed.
No hair marks from the brush or clogging of paint puddles in the corners of panes, angles of moldings etc., shall be left on the work.
In painting doors and windows, the putty round, the glass panes must also be painted, but care must be taken to see that no paint stains etc. are left on the glass top of shutters and surfaces in similar hidden location shall not be left out in paint.
In painting steel work, special care shall be taken while painting over bolts, nuts, rivets, overlaps etc.
The additional specifications for primer & other coats of paints shall be as according to the detailed specifications under the respective headings.

BRUSHES AND CONTAINERS :

After work, the brushes shall be completely of paint and linseed oil rinsing with turpentine. A brush in which paint has dried up is ruined and shall on no account be used for painting work. The containers when not in use, shall be kept closed and free from air so that paint does thicken and also shall be kept safe from dust , When the paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that they are clean, and can be used again.

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VRF AIRCONDITIONING UNITS

SPECIFICATION FOR AIR-CONDITIONING WORK

1 OBJECTIVE OF THE SPECIFICATION

This specification is intended to cover the design, manufacture, testing and delivery, duly packed for transport to site, for complete Air-conditioning work as specified herein after for the Building.

The scope of the specification also includes the complete erection, final check-up, testing and commissioning at the site of the entire equipments to be supplied under this specification.

2 GENERAL INFORMATION

Proposed to install the VRF/VRV air-conditioning system for air-conditioning of the Building .

2.1 BASIS OF DESIGN

OUTSIDE DESIGN CONDITION

Summer	:	100 °F DBT & 82 °F WBT
Inside Design Condition	:	24 ±0.5 °C DBT, around 55% RH.
Occupancy	:	Normal.
Lighting load	:	1.0 W/sq.ft

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Fresh air : 10 cfm/person per air change.

2.2 ELIGIBILITY CRITERIA

The Tenderer should be a manufacturer of the product & they should quote their own make only and the manufacturer should have INDIAN manufacturing facility as OEM with NABL certificated testing facility in INDIAN factory. The tenderer shall also have to furnish Completion certificate from any Govt./PSU organisation to the effect that the same type of equipment is working satisfactorily under Indian weather at for two years or more than that from the date of its commissioning.

2.3 REFRIGERATION LOAD & SCHEME OF UNITS

The scheme of units is enclosed in for Building.

3 SCOPE OF WORK

The scope of this Section comprises the supply, erection testing and commissioning of Variable Refrigerant Flow (VRF) type air-conditioning system confirming to these specifications listed below for air -conditioning different areas (as specified in the Annexure – I) inside the proposed Building.

3.1 VARIABLE REFRIGERANT FLOW (VRF) SYSTEM

TYPE

Units should be **DC Inverter Technology** based VRF/VRV air-conditioners with air-cooled outdoor units, which shall be capable of cooling as per individual or season requirement suitable for operation on 415V, 3 Phase, 50 Hz AC electric supply.

The outdoor units shall have cooling mode, consisting of one/multiple modules with single circuit of refrigerant piping and multiple indoor units of various types & capacities. Each indoor unit should have capability to cool independently for the requirement of particular area & also as per seasonal weather changes.

The indoor unit on any circuit can be different type & capacity and also controlled individually. It must have the facility to connect following types of indoor units to the system.

- # Ceiling mounted Cassette type
- # Ceiling mounted Duct Type
- # Ceiling mounted Low Static Duct Type
- # Hi-Wall mounted type
- # Ceiling Suspended Type
- # Floor Standing Type

However all the above mentioned units may not be applicable for this project.

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GENERAL

Indoor units & outdoor units shall be factory assembled, tested and filled with first charge of R 410A refrigerant only before delivering at site & should be suitable for operation on 380V- 415V, 3 Phase, 50 Hz AC electric supply.

Units should be air cooled type, Inverter Technology based variable refrigerant flow type air conditioner consisting of outdoor units and multiple indoor units, each suitable to cool in summer as per the requirements.

All proposed out door unit should have minimum Coefficient of Performance (COP) at 39^0C DB outdoor condition 19^0C WB conditions of 3.7 at 100% load & 4.2 at 50% load condition respectively for Cooling Operation.

The **inverter technology** based VRF equipment should be capable enough, so that the refrigerant piping between indoor and outdoor unit shall be extendable upto 1000m with maximum height difference between outdoor & indoor unit of 110m & level difference between two indoor unit maximum up to 40m. The equipment also should have the capacity to cater total piping length of 1000m.

Outdoor Unit

The outdoor unit shall be a factory assembled unit housed in a sturdy weather proof casing constructed form rust-proofed mild steel panels coated with a baked enamel finish. The unit should be completely factory wired tested with all necessary controls. It should be Air Cooled type with Top Air discharge, with liquid Injection system, BLDC motors.

The System must have the following features:

- All outdoor units shall have Inverter scroll compressors and be able to operate even in case one of compressor is out of order in case in multiple compressors unit.

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- It should also be provided with duty cycling for DC inverter scroll compressors capable of changing the rotating speed of compressor by inverter controller to follow variation in cooling loads & switching staring sequence for better stability and prolonging equipment life.

- If one compressor malfunctions, other continues to provide emergency operation smoothly till repair is effected.

- It should also be provided with duty cycling for multiple inverter compressor switching starting sequence for better stability and prolonging equipment life.

- All out door unit must have pump out and pump down feature so that incase of failure, refrigerant can be accommodated in indoor and out door unit respectively.

- The outdoor unit shall be modular in design and should be allowed for side by side installation.

- The unit shall be provided with its own microprocessor control panel.

- The out door unit must have the feature of Record running parameters of last 3 minutes before failure, for fault analysis & easy, faster trouble shooting.

- All out door unit must have the feature of auto recharging of refrigerant.

- All out door unit must have Anti Corrosive Fins, preferably Gold Fin Condenser for better life.

- All out door unit should have Oil recovery system.

- All out door unit should have connectable range of Indoor units from 0.6 TR to 8 TR.

- The outdoor unit should have Auto Reset function, if any malfunction occur in any of the Indoor Unit the system should Auto Bypass the faulty system and rest of the units should function normal condition.

- Outdoor unit shall be suitable for mix match connection of all type of indoor units.

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- The condensing unit shall be designed to operate safely when connected to multiple fan coil units.
- All out door unit should have Auto Backup function.
- The outdoor unit should have low noise level which should not exceed 65 db(A)±3 during normal operation. It should have night quite mode operation as a standard feature.
- All out door unit should have step less capacity control ranging from 10% -130% to meet load fluctuations.
- It should be equipped with Liquid Injection system so that no deration happens upto 39 deg C Ambient, capable of continuous operation at 48 deg C.

Compressor

The compressor shall be of highly efficient hermetic scroll type and equipped with DC INVERTER capable of capacity modulation.

HEAT EXCHANGER

The heat exchanger shall be constructed with copper tubes mechanically bonded to aluminum fins to form a cross fin coil. The aluminum fins shall be covered by anti-corrosion resin film.

REFRIGERANT CIRCUIT

The refrigerant circuit shall include an accumulator, liquid and gas shut off valves and a solenoid valves.

All necessary safety devices shall be provided to ensure the safety operation of the system.

SAFETY DEVICES

The following safety devices shall be part of the outdoor unit;

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High Pressure Switch, Low Pressure Switch, Fan Motor Safety Thermostat, Inverter Overload Protector, Over Current Relay, Fusible Plugs, Fuses.

OIL RECOVERY SYSTEM

Each unit shall be equipped, with an oil separator to ensure stable operation with long refrigerant piping.

INDOOR UNIT:

General

The Indoor unit shall be Ceiling mounted Cassette type or Ceiling mounted Ductable Type or Wall Mounted type or other as specified in BOQ.

These units should be suitable for operation on 220V-240V, Single Phase, 50 Hz AC electric supply.

These units shall have electronic control valves to control refrigerant flow rate in response to load variation in the room.

The address of IDU shall be set automatically in case of individual and group control.

The IDU shall be basically a Fan coil unit suitable for Ceiling/Wall hung type. Each unit shall have Cooling coil, Blower, Filter, BLDC Motor, Drain pan and accessories. All the IDUs installed to have individual Cordless/Corded Remote controls.

Indoor unit shall have cleanable type filter to an integrally moulded / moulded plastic frame. The filter shall be slide away type and neatly inserted.
It shall be possible to clean the filters either with compressed air or water.

The Cooling coil shall have Aluminum fins and copper tubes. The Fan section shall be dual suction, aerodynamically designed & balanced turbo, multi blade type blower to ensure low noise and vibration free operation and having multiple

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speed motor. The fan shall be direct driven type, mounted directly on motor shaft having support from housing. The Cassette units to have Automatic drain pump.

All Cassette & Ductable units should have Inbuilt Drain pump as a standard feature to avoid any sort of water logging problem.

Ceiling Mounted Cassette Type Unit (Multi Flow Type)

The unit shall be ceiling mounted type. The unit shall include pre-filter, fan section and DX coil section. The housing of the unit shall be powder coated galvanised. The body shall be light in weight & shall be able to suspend from four corners.
The unit shall have an external attractive panel for supply & return air. Unit shall have four-way supply air grills on sides and return air grill in centre.
Each unit shall have high lift drain pump, low gas detection system and very low operating sound which should not exceed 47 db(A)±3.

Ceiling Mounted Ductable Type

Units shall be suitable for ceiling mounted type. The units shall include pre-filter, fan section & DX coil section, drain pump for lifting the condensate. The housing of the unit shall be powder coated galvanised. The body shall be light in weight & shall be able to suspend from four corners. The unit shall have high static fan for duct arrangement & inbuilt drain pump to avoid any drainage issues.
All small ducted units upto 2 TR capacity should have a maximum height of 190 mm for flexibility of installation & beyond 2 TR the height of unit should not exceed maximum 460 mm.
The noise level for these unit should not exceed 55db(A)±3

Wall Mounted Type

The unit shall be wall mounted type. The units shall include pre-filter, fan section & DX coil section. The housing of the unit shall be powder coated galvanised. The body shall be light in weight & flat finish type. The unit shall have an attractive external casing for supply & return air. The noise level for these unit should not exceed 48db(A)±3.

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Y-Joints

Supply & installation of Y- Joints/separation refrigeration pipe joints and headers in the appropriate orientation to enable correct distribution of refrigerant. The distribution joints should be factory insulated with pre-formed section of Expended polystyrene/Equivalent.

3.2 REFRIGERANT PIPING

- Refrigerant piping for the air-conditioning system shall be upto 15.88mm dia. of soft seamless copper tubes & for above 15.88mm dia the pipe material shall be of hard seamless copper tubes with pipes material being hard drawn copper pipe.

- Before jointing any copper pipe or fittings, its internals shall be thoroughly cleaned by passing a clean cloth via wire or cable through its entire length. The piping shall be continuously kept clean of dirt etc. while constructing the joints. Subsequently it shall be thoroughly blown out using nitrogen gas.

- After completion of installation of the refrigerant piping, the piping system shall be pressure tested using nitrogen gas at a suitable pressure as specify by OEM (Original Equipment Manufacturer). Pressure shall be maintained in the system for 48 hours. The system shall then be evacuated to a vacuum of not less than 700 mm Hg and held for minimum 24 hours.

- The suction line pipe size and the liquid line pipe sizes shall be selected according to the manufacturer's specified diameter. All refrigerant pipes shall be properly supported and anchored to the building/structure using steel hangers, fastener, brackets and supports which shall be fixed to the building/structure by means of inserts or expansion shields or anchor fasteners of adequate size and number to support the load imposed thereon.

- The refrigerant piping should be laid in core cut in the floors in such a way that it should not distort the interior of the room, wherever the refrigerant pipe has to be laid across the room, it should be laid in a concealed manner by making appropriate boxing arrangement matching with the interior of the room. All associated minor Civil Engineering works (like chasing on wall, ceiling & replastering and repainting etc.) related with the above items are included in the scope of work.

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- All exposed copper pipes have to be covered by 24 G GI sheet

- Entire liquid and suction refrigerant pipe lines including all fittings, valves and strainer bodies etc. Shall be insulated with 19mm/ 13 mm thick Nitrile rubber as specified in BOQ.

3.5 DUCTING & AUXILIARIES

Ducting including SA Grilles, Diffusers, Fresh Air Dampers shall be supplied. Duct hangers, supports, and supports with Vibration isolating pad over the supports shall be supplied. Joints shall be leak tight reasonably.

3.6 DRAIN PIPING

G.I. /PVC condensate drain pipe in the drain point of indoor units shall be provided.

3.7 PAINTING

All the equipments, mounting frames, stands etc. shall be painted with 2 coats of suitable paints of approved colour over the priming paint to prevent corrosion of the equipment.

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TECHNICAL SPECIFICATION FOR FIREFIGHTING

1.1A. ADDRESSABLE FIRE ALARM SYSTEM:

FIRE ALARM CONTROL PANEL:

Analog addressable 2 loop expandable to 4 loop fire alarm control panel. The panel shall have 16 zonal LED indicators, programmable sounder circuits, programmable inputs, programmable relays, 3A power supply, Large graphic display, Real time clock, Expandable from 2 to 4 loops, Certified to EN54-2/ EN54-4, Up to 512 additional programmable I/O via HFP I/O modules, Powerful, network wide cause and effects, Sensitivity adjustment and Drift Compensation, Can be networked with HFP control panels, Compatible with HFP and HFP AP-CRL, repeaters, Stores 500 last events in event log Dial up modem connection available, Compact, stylish enclosure, Installer friendly, removable equipment chassis, Different language and character set variants available, Fully EN54-2 and EN54-4 compliant improved front loading Printer option. Model number is as specified in the BOQ.

1.2MULTI SENSOR DETECTOR:

Multi- Sensor which is fully compatible with ESP Analogue Addressable Protocol, having removable high performance chamber with Twin fire LED's allow 360 degree viewing, User selectable modes, Incorporate Optical and Heat elements, lock mechanism (sensor to base), Electronically addressed, approved by LPCB & Vds. Pulsing/non-pulsing controlled from panel. Variable sensitivity. Electronically Addressed. Model number is as specified in the BOQ.

Specification

Operating Voltage:		17 – 41 V dc
Low Power Mode (typ):		120 A
Quiescent Current (typ):		400 A
Alarm Current (controlled by CIE):		9.1 mA (excluding remote indicator)
Transmission Method:		Digital Communications Using ESP
Operating Temperature:	Range	-20 °C to + 60 °C
Operating Humidity:		95%RH - Non Condensing (at 40 °C)
Storage Temperature:		Range -30 °C to + 60 °C
Storage Humidity:		<80% RH at 60 °C
Colour / Case Material:		White / Polycarbonate
Weight (g):		95

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Diameter (mm) / Height (mm): 100 / 45

RESPONSE INDICATOR:

Response Indicator for Above False Ceiling and Below False Ceiling Detector.

1.3MANUAL CALL POINT:

Analogue Addressable Manual Call Point ESP Analogue Addressable Protocol having status LED for Alarming & standby mode, electronically addressed, approved by LPCB. Shall be fast response, Bi-colored status LED (red for alarm, amber for short-circuit), Non-frangible element fitted as standard (conforms to EN54), Addressed with TCH-B100 Hand Held Programmer. Surface or flush mounting. LPCB Approved to EN54. Model number is as specified in the BOQ.

Operating Voltage:	17 - 41Vd.c.
Low Power Mode:	180µA (max), 100µA (typ)
Quiescent Current:	350µA (max), 250µA (typ)
Alarm Current:	10.0mA (max), 5mA (typ)
Resistance in positive:	100mΩwhen closed (max), 100kΩwhen open (min)
Short-circuit threshold (typ):	430Ω
Transmission Method:	Digital Communication Using ESP
Operating Temperature Range:	-10°C to + 50°C
Storage Temperature Range:	-30°C to + 70°C
Maximum Humidity:	95%RH - Non Condensing (at 40°C)
Ingress Protection Rating:	IP24

1.4WALL SOUNDER:

Analogue Addressable Loop powered Wall Sounder providing 8 Volume levels & 51 Tones with a maximum o/p of up to 102 dB(A) with low current consumption, can be fitted on Isolator Type Base which is fully compatible with ESP Analogue Addressable Protocol, User selectable modes, Electronically addressed, approved by LPCB. Model number is as specified in the BOQ.

Operating Voltage:	17 ~ 41Vd.c.
Quiescent Current (typ):	150µA Approx.
Sounding Current (typ):	2mA (90dB(A) (±2dB(A)) @ 1m) ~ 8mA (102dB(A) (±2dB(A)) @ 1m)
Sound Output (at 1 metre):	90 ~ 102dB(A) (±2dB(A)) @ 24Vd.c. or above
Number of Tones:	51
Tone Frequency Range:	300Hz ~ 2850Hz
Operating Temperature Range:	-10°C to +50°C

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Storage Temperature Range:	-30°C to +70°C
Maximum Humidity:	95%RH - Non Condensing (at 40°C)
Colour/Case Material:	Red or White/ PC ABS
Ingress Protection Rating:	IP21 (IP65 with WS2-WPK)
Weight (g)/Dimensions (mm):	152 / H112 x W112 x D67
Base Fixing Centers (mm):	48 ~ 74

1.5 ISOLATOR BASE:

Isolator Base fully monitored for short/Open circuit compatible with ESP Analogue Addressable Protocol,Electronically addressed, approved by LPCB,unit incorporated an amber LED to show when it is isolating a section of a Loop. Model number is as specified in the BOQ.

Operating Voltage:	17 - 41Vd.c.
Quiescent Current (typ):	50µA
Current In Short Circuit:	<10mA
Maximum Short Circuit Current:	1A
Operating Temperature Range:	-10°C to + 50°C
Storage Temperature Range:	-30°C to + 60°C
Maximum Humidity:	95%RH - Non Condensing (at 40°C)

Maximum Number of Isolators per Loop: 127

1.6WIRING:

Low voltage cables shall be aluminum conductor, PVC insulated, Screened, armoured, multi strand construction. The cables shall conform to IS 1554 Part I in all respects. Cables shall be laid in tray/Hume pipe/in ready made trenches etc., as required.

The sizes of cables shall be selected to limit the voltage drop during running and voltage dip during starting to 5% and 10% respectively. Adequate derating factors shall be considered

RATING - The cable shall be rated for a voltage of 1100 Volts.

CORE IDENTIFICATIONS

Cores shall be provided with the following color scheme of PVC insulation:

1 core	:	Red/Black/Yellow/Blue
2 core	:	Red and Black
3 core	:	Red, Yellow and Blue

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3 1/2 / 4 core : Red, Yellow, Blue & Black

Cable with all accessories for Looping.

Supply of 2C X 1.5sq.mm, screened, armored, multistranded cable.

2..B. PUBLIC ADDRESS SYSTEM:

2.1CONTROLLER:

Alarm controller, shall complies with standards for emergency sound systems (IEC 60849), and shall have the capacity of 6 zone system controller, built in with 240 W booster amplifier, 12 business and emergency control in – and outputs. The controller has two BGM source inputs and a mic/line input with configurable priority, speech filter, phantom power and selectable VOX activation. A total of 16 priority levels can be specified for microphone, call stations and trigger inputs for optimum system flexibility. The powerful 240 W output section has six transformer-isolated 100 V constant voltage outputs for driving 100 V-loudspeakers in six separate zones. The 100 V-technique reduces line losses on longer distances and allows for easy parallel connection of multiple loudspeakers. All zones may be individually selected from the front panel and the BGM output level in each zone can be individually set in 6 steps. The BGM output is connected to the 70V line, thus it is possible to connect a total load of 480 Watts in a two channel system combined with a 480 Watt booster. Model number is as specified in the BOQ.

2.2CALL STATION:

6-zone call station, intended for LBB 1990/00 Voice Alarm System Controller. Six zone selection keys, all-call key and momentary PTT-key for calls Selectable gain, speech filter and limiter for improved intelligibility LED indications for zone selection, fault and emergency state Call station extension provides 7 additional zone and zone group keys. On each call station it is possible to select 6 zones with the possibility to connect up to 8 call station keypads (LBB 1957/00) to increase the number of zones or zone groups that can be selected. Each keypad adds 7 zone or zone group keys. This call station features selectable gain, a selectable speech filter and a limiter for improved intelligibility, even if the speaker moves in front of the microphone. Because the call station provides a balanced line level output, it can be positioned up to 1000 m away from the controller, using CAT- 5 extension cables. Using dipswitches on the bottom of the call station different microphone gain levels can be select as well as the call station ID and the speech filter. Selected zones are indicated with LEDs on the call station, three additional LEDs give visible feedback on the active state of the microphone and the system. Green indicates microphone active, amber indicates that the system has detected a fault (IEC 80649) and red indicates that the system is in the emergency state. Model number is as specified in the BOQ.

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2.3AMPLIFIER:

Amplifier with XLS inputs / outputs facility, Direct 100V input for power expansion, Excellent S/N >80dB, input level control, Low profile 2U housing, LBD 1938 (3 U housing), multiple outputs. Model number is as specified in the BOQ.

2.4SPEAKER:

Ceiling speaker, shall be three lead wires are provided on the matching transformer (Primary) to allow selection of nominal full power, half power or quarter power. Installation is simple and quick. Shall be easy to install with spring – loaded mounting clamps. Power handling capacity 6 Watts / 4 Watts. Excellent frequency response. High sound pressure level. Wide opening angle. Inbuilt 100V line matching transformer. Compact size. Optimized for music and speech applications. Ideal for mounting in false ceiling. Model number is as specified in the BOQ.

Music reproduction,Increased sensitivity,Flush-mounting at Wall cavity,Easy to install,Protective dust cover,Optional certified fire dome,Simple power setting. Matching surface mounting box,Comply with international safety regulations.6 Watts Mounted Speaker. Model number is as specified in the BOQ.

2.5EQUIPMENT RACK:

Control equipment with fan tray, lockable front and rear door, Monitor speaker complete in all respect.

2.6PLENA MESSAGE MANAGER:

Highly flexible stand-alone digital message player, Up to 12 messages and 12 trigger inputs. Uploads messages from a PC in,WAV-format.Compliant with standards for emergency sound systems, Zone control for Plena system, pre-amplifier ,Front panel control and remote control.

2.7DVD PLAYER:

DVD player, shall be able to play music.

2.8WIRING:

NLUO	PMC	CONTRACTOR
SIGNATURE AND SEAL	SIGNATURE AND SEAL	SIGNATURE AND SEAL

Low voltage cables shall be aluminum conductor, PVC insulated, Screened, armoured, multi strand construction. The cables shall conform to IS 1554 Part I in all respects. Cables shall be laid in tray/Hume pipe/in readymade trenches etc., as required.

The sizes of cables shall be selected to limit the voltage drop during running and voltage dip during starting to 5% and 10% respectively. Adequate derating factors shall be considered

RATING - The cable shall be rated for a voltage of 1100 Volts.

CORE IDENTIFICATIONS

Cores shall be provided with the following color scheme of PVC insulation:

1 core	:	Red/Black/Yellow/Blue
2 core	:	Red and Black
3 core	:	Red, Yellow and Blue
3 1/2 / 4 core	:	Red, Yellow, Blue & Black

Cable with all accessories for Looping.

Supply of PA system Cables for speakers 2C X 1.5sq.mm, screened, armoured, multistranded with termination of cable wherever required and applicable.

3.C. EMERGENCY LIGHTING SYSTMEM:

EMERGENCY LIGHTING CONTROL PANEL:

Emergency control panel conforms to SFS - EN- 50172 either locally or remote access, Emergency Lighting Control Panel with two lighting lines with maximum of 254 devices on both lines, up to 127 devices per line, luminare line length 500/1000 Meters. The System shall work on Extra Low Voltage and shall be addressable. Complies with BS5266. Supports 2 lighting lines with 127 points per line. Slim profile - only 100mm deep. Robust design . Model number is as specified in the BOQ.

3.1TRANSFORMER:

ELS Panel Transformer 230 V with an output of 35V AC and is placed between mains and EL2 Control panel

3.2EXIT SIGNAGE – 20 METERS RANGE:

Addressable Exit Signage visible from 20 mtrs with integral battery capacity of 3 hrs and bi-colored LED status indicator. Available in Left, Right, Down signs. Comply with BS5266. EL-20 visible at 20 metres. EL-40 visible at 40 metres. LED technology. Integral back-up battery inside ‘cup’. Hinged to fit to any surface angle. Range of arrow directions. Model number is as specified in the BOQ.

3.3EXIT SIGNAGE – 40 METERS RANGE:

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Addressable Exit Signage visible from 40 mtrs with integral battery capacity of 3 hrs and bicoloured LED status indicator. Available in Left, Right, Down signs. Comply with BS5266. EL-20 visible at 20 metres. EL-40 visible at 40 metres. LED technology. Integral back-up battery inside 'cup'. Hinged to fit to any surface angle. Range of arrow directions. Model number is as specified in the BOQ.

3.4CORRIDOR DOWN LIGHT:

Addressable Closed Area LED Down lighter compiling with BS5266 with integral battery capacity of 3 hrs and bicoloured LED status indicator. Complies with BS5266 for escape routes. LED technology. Integral back-up battery. Fitted to standard Hochiki base (YBN-R/3). Model number is as specified in the BOQ.

3.5OPEN AREA DOWN LIGHT:

Addressable Open Area LED Down lighter complying with BS5266 with integral battery capacity of 3 hrs and bicoloured LED status indicator. Complies with BS5266 for escape routes. LED technology. Integral back-up battery. Fitted to standard Hochiki base (YBN-R/3). Model number is as specified in the BOQ.

3.6STEP LIGHTING UNIT:

Addressable Step Lighting Unit with internal battery capacity of 3 hrs and bi coloured LED status indicator. LED technology. Integral back-up battery. Semi-flush fit. Ideal for low-level lighting. Model number is as specified in the BOQ.

3.7KEY PAD:

Key pad with an LCD to control, read and configure the Main ELS Control Panel. **EL-KP Keypad** Complies with BS5266. Provides control over FIRE scape system. Easy-to-read LCD display. Robust design. Slim profile. Programmable function buttons. Password protected menus. Model number is as specified in the BOQ.

3.8UNDER VOLTAGE MONITORING DEVICE:

Under-voltage monitoring device that constantly assesses the condition of a mains lighting circuit. Triggers at 75% of the nominal lighting circuit supply. **EL-PM Phase Control Unit,** Monitors final mains lighting circuit. Switches power from line to individual FIREscape unit backup batteries when voltage drops. Model number is as specified in the BOQ.

3.9MOUNTING BASE:

Common mounting base which is used to mount luminaires and exit signs. **YBN-R/3.** Electronics free. Stainless steel contacts. Takes 2.5mm² cables. Slim profile - only 8mm. Rugged wiring contacts. Facility for remote indicator. Quick Connection via square cable clamps. Model number is as specified in the BOQ.

3.10PROGRAMMING SOFTWARE:

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Configuration and programming software tool for use with Emergency lighting control panel. Software is used to configure light levels,set up lighting areas and create input and output parameters during set up and commissioning.

3.11WIRING:

Low voltage cables shall be aluminum conductor, PVC insulated, PVC sheathed and steel wire armored or steel tape armored, FRLS- PVC out sheathed construction. The cables shall conform to IS 1554 Part I in all respects. Cables shall be laid in tray/Hume pipe/in readymade trenches etc., as required.

The sizes of cables shall be selected to limit the voltage drop during running and voltage dip during starting to 5% and 10% respectively. Adequate derating factors shall be considered

RATING - The cable shall be rated for a voltage of 1100 Volts.

CORE IDENTIFICATIONS

Cores shall be provided with the following color scheme of PVC insulation:

1 core	:	Red/Black/Yellow/Blue
2 core	:	Red and Black
3 core	:	Red, Yellow and Blue
3 1/2 / 4 core	:	Red, Yellow, Blue & Black

Cable with all accessories for Looping.

2 X .8 sq mm Shielded & Screened Flexible Cable with all accessories for Looping

4 X 1.5 Sq mm Flexible cable with all accessories

3.12FM 200 FIRE SUPPRESSION SYSTEM:

The FM-200 flooding system is designed to conform to IES 15519, the National Fire Protection Association (NFPA) 2001 and ISO/PF 20885 standards. The System comprises various components that come together to create an unbeatable suppression system.

Agent Tank An essential component of the system, these high-pressure tanks are available in 4 container configurations, namely 22, 34, 55, 70, 80, 100, 125 and 150 litres. Depending upon the requirement, single or multiple containers are installed. All containers are available with a range of manifolds - creating a common outlet for the extinguishing agent to escape from multiple cylinders.

Valves and Actuation Line The FM-200 system's valves have a maximum working pressure of 150 bar valve seat 42mm. Since it's already integrated, no additional pneumatic actuator is required. Manual, pneumatic as well as electrical activations

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are available. Each valve comes with a pneumatic option and a master and slave.

Nozzles The extinguishing agent is dispersed through brass discharge nozzles. These nozzles are designed by the Design Cell after surveying the area. From the size of the nozzle orifices, to the dispensing technique – single cut or cross cut – the nozzles are created specially for your requirements. The nozzles are available in various sizes, from 20mm to 50mm.

Pipes and Fittings High-quality pipes harness atomization technology. This pressurizes the system, making it a part of the detection mechanism as well as ensuring the extinguishing agent is discharged quickly to the nozzles through the network of pipes.

Detection Devices Depending upon the requirements of the area being protected, the system integrates different types of detectors, such as smoke detectors, heat detectors, linear heat detectors and aspirating detectors. In addition, an audible alarm alerts personnel in the area to the danger.

The FM-200 Control Panel Designed and manufactured to the highest standards in a quality-controlled environment, the FM-200 control panel offers outstanding value and performance. With three detection zones, the extinguishing agent's release can be activated from any combination of detection zones. The panel contains a large LED display to enable easy configuration and control. The countdown timer is duplicated on up to seven remote status units to provide local indication of the FM-200system's status. With all the electronics mounted on a single, easily removable, steel plate, the panel is both robust and easy to install.

4.D. FIRE EXTINGUIDHERS:

4.1ABC POWDER EXTINGUISHER – 6 Kgs:

6 Kg capacity Fire Extinguisher Mono Ammonium Phosphate Powder 90,stored pressure type, pressure gauge, gross weight 9.4 Kg., empty weight 3.4 Kg., can height 480MM,diameter 160 MM, discharge time minimum 13 secs, controllable discharge mechanism, range minimum 4 meters, applicable on Class A,B,C and electrically started fire, A rating 4A,B rating 34B,Can construction: Deep drawn and Carbon Di Oxide Mig welded, valve construction: Forging and Machining, Internal Coating of Can: Epoxy Powder coating, External Coating of Can: Epoxy Polyster Powder coating ,External Coating of Can: Epoxy Polyster Powder Coating, Sheet metal thickness : 1.60 MM, Helium Leak Detection Tested, ISI, CE approved, 5 Years Warranty.

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4.2ABC POWDER EXTINGUISHER – 4 Kgs:

4 Kg capacity Fire Extinguisher Mono Ammonium Phosphate Powder 90,stored pressure type, pressure gauge, gross weight 6.9 Kg., empty weight 2.9 Kg., can height 440MM,diameter 140 MM, discharge time minimum 13 secs, controllable discharge mechanism, range minimum 4 meters, applicable on Class A,B,C and electrically started fire, A rating 3A,B rating 34B,Can construction: Deep drawn and Carbon Di Oxide Mig welded, valve construction: Forging and Machining, Internal Coating of Can: Epoxy Powder coating, External Coating of Can: Epoxy Polyster Powder coating ,External Coating of Can: Epoxy Polyster Powder Coating, Sheet metal thickness : 1.60 MM, Helium Leak Detection Tested, ISI, CE approved, 5 Years Warranty..

4.3WATER CO2 TYPE FIRE EXTINGUISHER – 9Ltrs:

9 Ltr Water type Fire Extinguisher, Stored Pressure Type, Pressure Gauge, Gross Weight 14.6 Kg, empty Weight 5.6 Kg, Can Height 611MM, Diameter 175MM, Discharge Time less than 120 Secs, Controllable discharge mechanism, Range minimum 6 Meters, applicable on Class A Fire, A Rating 13A, Can Construction : Deep drawn & CO2 Mig welded, Valve Construction : Forging & Machining, Internal Coating of Can : Epoxy Powder coating, External Coating of Can : Epoxy Polyester Powder coating, Sheet metal thickness : 2.0MM, ISI and EN Approved, Hileum Leak Detection tested, 1 Year Warranty.

4.4CO2 TYPE FIRE EXTINGUISHERS-4.5 Kgs:

4.5Kg, Co2 Gas Type Fire Extinguisher, Trolley Mounted, Easy Weight Management, Used Unused Mechanism, Squeeze Grip, Gross Weight 19.1 Kg, empty Weight 14.6 Kg, Can Height 857MM, Diameter 140MM, Discharge Time less than 10 Secs, Controllable discharge mechanism,Applicable on Class B&C Fire, B Rating 21B, Can Construction : Hot Spinning / Forging, Valve Construction : Forging & Machining, Internal Coating of Can : Not Applicable, External Coating of Can : Spray Painting, Sheet metal thickness : 4.5MM, ISI Approved, 1 Year Warranty

5.E. **ESCAPE SIGNAGES:**

5.1. sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC non-reflective self adhesive vinyl painted foam board. Signage with the following text "IN CASE OF FIRE, USE STAIRS UNLESS INSTRUCTED OTHERWISE" of 1.25cm height letters in red with white back ground. The size of the board shall be 25cm x 30 cm and shall be fixed at the height of 2 mts. from finished floor near Manual call points.

5.2. Sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC non-reflective self adhesive vinyl painted foam board. Floor identification signage (ie, GROUND FLOOR …etc.) at each stair enclosure on every floor, indicating the floor number in words, lettering size shall be 7.5 cm with contrasting color from back ground. Size shall be 15cm x 60cm.

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5.3. Sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC non-reflective self adhesive vinyl painted foam board. Signage with the following text "FIRE EXIT" at each stair enclosure on every floor, lettering size shall be 7.5 cm with contrasting color from back ground. Size shall be 15cm x 60cm.

5.4. Sign boards made out of 3mm thick "Opaque" PVC foam board with computer cut, PVC non-reflective self adhesive vinyl painted foam board. Signage with the following text "FIRE EXIT" AND DIRECTION TO SHOW THE EXIT ROUTE, lettering size shall be 7.5 cm with contrasting color from back ground. Size shall be 15cm x 60cm.

5.5. Signage "FIRE ORDER" it should contain the following text on 3mm thick "Opaque" PVC foam board of computerized cut, PVC non-reflective self adhesive vinyl painted foam board of size 3' x 4'.

A) ALERT THE SECURITY AT SECURITY ROOM BY ACTUATING MANUAL CALL POINT LOCATED AT STRATEGIC LOCATIONS.

B) EVACUATE THE OCCUPANTS BY USING FIRE EXITS AND EMERGENCY EXITS ONLY AND ASSEMBLE AT VARIOUS ASSEMBLY POITS.

C) IF POSSIBLE TRY TO EXTINGUISH THE FIRE BY USING NEAREST / SUITABLE PORTABLE EXTINGUISHER OR WATER FROM NEAREST WET RISER.

D) BE CALM AND DO NOT GIVE ANY ROOM FROM PANIC, WALK, DO NOT RUN.

E) IF YOU ENCOUNTER SERIOUS DIFFICULTY IN EVACUATION, LIE DOWN FLAT AND TRY TO ATTRACT ATTENTION OF RESCUE TEAM.

5.6. ACTION BY SECURITY/RECEPTION UPON RECEIPT OF INFORMATION THROUGH FIRE ALARM OR FIRE DETECTORS OR BY USING PUBLIC ADDRESS SYSTEM.

A) ALERT THE OCCUPANTS BY USING PUBLIC ADDRESS SYSTEM.

B) INFORM FIRE CONTROL THROUGH ANY ONE OF THE FOLLOWING PHONE NUMBERS: _____ (Current phone numbers to be provided in this location by the contractor)

C) REFER EVACUATION PLAN FROM EVACUATING STANDARD PEOPLE.

D) GUIDE THE FIRE FORCE, ON THEIR ARRIVAL TO THE SEAT OF FIRE.

E) IN CASE OF THE CASUALTIES, CALL AMBULANCE BY DIALLING NUMBER: _____ (Current phone numbers to be provided in this location by the contractor)

F) FIRE FIGHTING AGENCY:

PHONE :_____ (Current phone numbers to be provided in this location by the contractor)

FAX : _____ (Current fax numbers to be provided in this location by the contractor)

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TECHINICAL SPECIFICATION FOR WI-FI SYSTEM AND LAN NETWORKING

Specification of Wireless Controller
Essential Features
Hardware Features
WLAN Controller should have minimum 4 nos. of Gigabit Ethernet Ports (GBIC or SFP) and Out of Band Management Port And Console port.

System should ready for 64 AP's Support from Day one with future scalability for 600 AP support.

Redundancy Features: Controller Must provide Active: Active . One redundant controller should be provided for redundancy with no point of failure at Controller side.

The controller should support link aggregation protocol.
Should support 4 Gbps Encrypted throughput.
1.General Feature requirements

System should provide air-time fairness between these different speed clients – slower clients should not be starved by the faster clients and faster clients should not adversely affected by slower clients.

Ability to map SSID to VLAN
Auto assignment of VLAN ID and user role, based on user ID

Should support automatic channel selection – interference avoidance (Co-channel management, Adjacent Channel Management, Channel reuse management)

2.Auto Deployment of AP's at different locations

Access points can discover controllers on the same L2 domain without requiring any configuration on the access point.

Access points can discover controllers across Layer-3 network through DHCP or DNS option

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3.Firewall & IPS

Built-in ICSA Certified Wireless Firewall in the Switch

Firewall should support minimum 100000 concurrent sessions.

System should provide L2 / L3 stateful firewall,Role based firewall, DOS attackes and Strom control

The firewall must be able to take action including to allow the traffic, deny the traffic, reject the traffic, route the traffic, destination or source NAT the traffic, modify the QoS level of the traffic, and blacklist (remove from the network) the client for policy matches.

Should include IPS licensing for 5 years from the date of installation.

4.System Architecture

Centralised MAC address filtering.

Should support onboard and external DHCP server

Controller should support Onboard AAA server.

The proposed architecture should be based on controller based Architecture with thick AP deployment. While Encryption / decryption of 802.11 packets should be performed at the AP.

Support roaming between access points deployed on same subnet and different subnets.

5.QoS features

Per user bandwidth Rate Limiting

Self healing (on detection of RF interference or loss of RF coverage)

Should support per user, per device, and per application/TCP-port prioritization

Dynamic load balancing to automatically distribute clients to the least loaded 802.11 channel and AP; load balancing must not require any client specific configurations or software

Adaptive RF management that provides the capability to pause channel scanning / adjust RF scanning intervals based on application and load presence.

Capability to provide preferred access for “fast” clients over “slow” clients (11n vs. 11g) in order to improve overall network performance.

Support advanced multicast features with multicast rate optimization, multi channel use and IGMP snooping

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6.RF Management

Should be able to load balance clients across channels and access points.

Should be able to load balance clients based on client count.

Should be able to load balance clients based on effective throughput on AP

Should be able to use client and throughput as a measure to load balance between bands

7.Inline Security Features

Should allow authenticated client devices to roam securely from one access point to another, within or across subnets, without any perceptible delay during re association.

Controller should support DES, 3DES and AES-128 and AES-256

encryption, with site-to-site and client-to-site

VPN capabilities; should have provision to supports upto 2000 concurrent IPSEC tunnels per switch/controller

8. Indoor Access Points -

8.1 **Standards**

Ethernet IEEE 802.3 / IEEE 802.3u

Power Over Ethernet IEEE 802.3af

Wireless IEEE 802.11a/b/g/n

8.2 **Radio Approvals**

UL/FCC/CE approvals/certifications

9. Category 6UTP Modular Jacks

UTP Jack Modules shall be Category 6. The eight position modules shall terminate unshielded twisted 4 pair, 22 – 26 AWG, 100 ohm cable and shall not require the use of a punchdown tool. Jack module shall use forward motion termination to optimize performance by maintaining cable pair geometry and eliminating conductor untwist. The termination cap shall provide strain relief on the cable jacket, ensure cable twists are maintained to within 1/8" (3.18 mm) and include a wiring scheme label. The blue module base shall signify Category 6 performance and shall include a universal label representing T568A and T568B wiring schemes. The jack modules shall be universal in design, including complying with the intermateability standard IEC 60603-7 for backward compatibility. Category 6 jack modules shall be UL and CSA approved and RoHS compliant.

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The jack modules shall be ETL verified to ANSI/TIA/EIA Category 6 and IEC/ISO 11801Class EA channel performance. The jack modules shall be able to be re-terminated a minimum of 20 times and be available in 11 standard colors for color-coding purposes. All lots and individual jacks shall be serialized for future traceability. Tool less termination.

10. Category 6 UTP Patch Cords

Patch Cords shall be constructed with Category 6, 23-AWG stranded cable. Patch Cords shall be factory terminated with modular plugs featuring a one-piece, tangle-free latch design and black strain-relief boots to support easy moves, adds and changes. Patch cords shall be wired to be compatible with both T568A and T568B wiring schemes. The patch cords shall come in standard lengths of one to 10 Mtrs. The patch cords are available in eight standard colors of White, Blue, Yellow, Green, Black, Red, Violet, and Orange.
The patch cords shall be ETL verified ANSI/TIA/EIA Category 6A and IEC/ISO 11801Class EA channel performance. Each patch cord shall be 100% performance tested at the factory in a channel test to the ANSI/TIA/EIA and IEC/ISO standards. All lots and individual patch cords shall be serialized for traceability.

11. Intelligent ready - Angular 24 port patch panel (unloaded)

The modular patch panel design shall accommodate copper RJ45 jack modules. The front of the panel shall include multi-colored LEDs located above each port that indicate the connectivity status, as well as multi-functional push buttons for diagnostic and configuration navigation. The panel shall offer a “common” method for labeling in compliance with
TIA/EIA 606-A labeling standards. The modular patch panel shall be angular. Accommodates intelligent modules that mount in the rear and utilize no additional rack space (zero RU)

12. Faceplates

Faceplates shall be 3 and 4 port , single gang faceplates with painted combination head screws. The faceplates shall mount to industry standard square back boxes with screw to screw dimensions of 2.28" (60.4mm). Faceplates shall be available with sloped design for improved bend radius control and dust protection. Each faceplate shall accept Jack Modules that can be individually inserted and removed as required.

13. Specification	**Value**
Flame Rating	Riser – NEC type CMR (UL) and FT4 rated Plenum – NEC type CMP (UL) and FT4 rated
Installation Tension	25 lbs. (110N) maximum

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Temperature Rating	32° to 140°F (0° to 60°C) during installation 14° to 167°F (-10° to 75°C) during operation

14. Mechanical Test	**Requirement**
Ultimate Breaking Strength	> 400 N (90 lb. ft.)
Minimum Bed Radius	25.4 mm (1.0 inch)

15. Electrical Test	**Requirement**
DC resistance	<90.38 Ohm per 100M (328 ft.)
DC Resistance Unbalance	<5% at 20°C per ASTM D 4566
Mutual Capacitance	<5.6 nF per 100M (328 ft.) at 1KHz and 20°C per ASTM D 4566
Characteristic Impedance	<5.6 nF per 100M (328 ft.) at 1 kHz and 20°C per ASTM D 4566
Propagation Velocity	>62.1 (at 250 MHz), CMR: 70%, CMP: 72%

16. Overhead Fiber Cable Routing Systems

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. Channel and fittings shall be assembled using pre-assembled couplers. A selection of spillout options shall be available that easily attach using the vertical tee. Fittings maintain a minimum 2" bend radius to protect against signal loss due to excessive cable bends. Available system colors shall be yellow, orange, and black. A full complement of brackets shall be available for attaching system components to ladder rack. UL Compliant

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17. Fiber Cable

6-fiber 9µm (OS1) singlemode Out door armored cable.Used in intrabuilding backbone, building backbone, and horizontal installations for riser (OFNR), and general-purpose environments. Sheath markings provide positive identification, quality traceability, and length verification.

Maximum Loss	3.5db/KM @ 850nm & 1.5db/KM @1300nm
Bend Radius	Installation - 96mm, Longterm - 48mm
Tensile Load	Installation - 660N, Longterm - 200N
Temperature	Installation/Operation: 0°C to +50°C, Storage: -40°C to +75°C

18. Rack Mount Fiber Tray

Rack mount fiber trays shall be constructed of steel material and mount to standard 19" rack rails and be RoHS compliant. Can be used as a back box for Fiber patch panels. The removable top cover provides access to connections, fibers and slack storage in rear of tray. Multiple trunk cable entry locations provided on rear and sides of enclosure. Includes fiber optic cable routing kit (grommets, cable ties, spools, strain relief bracket and ID/caution labels).

19. Fiber Adapter Patch Panels

Fiber adapter patch panels shall be constructed of steel material and mount to standard 19" rack rails and be RoHS compliant. UseD with fiber mount tray to protect fibers and terminations.

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20. Fiber Adapter panels

Fibre adapter panels snap quickly into the front of fibre optic patch panels. Fibre adapter panels contain TIA/EIA-604 FOCIS compliant duplex fibre optic adapters and exceed TIA/EIA-568-B.3 requirements. Loaded with three SC Duplex Multimode Fiber Optic Adapters (Aqua) with zirconia ceramic split sleeves.

Gigabit layer-2 managed poe switch

20.1. The switch shall be a hardware based, reliable, purpose-built SNMP stackable managed switch with concurrent Power-over-Ethernet (PoE) support on all 24 ports and shall support RPS from day one.

20.2. The switch shall support both 802.3af and 802.3at PoE standards as per site requirement on each switch port and shall have a minimum PoE power bidget of 370 watts. The switch shall also support enhancement of the available PoE power budget.

20.3. The switch shall be IPv6 phase 2 certified and shall be a complete package inclusive of hardware, software and required licenses to meet the minimum desired features from day-one.

20.4 The switch shall have at least 20 gigabit copper ports plus at least 4 Combo SFP ports in addition to 2 dedicated 20Gig bi-directional stacking ports.

20.5 The switch shall offer wire speed non-blocking throughput of at least 88Gbps with packet forwarding of at least 65Mpps.

20.6 The switch shall support 16000 MAC address entries and a packet buffer of at least 2MB. The switch shall support at least 4000 VLANs.

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20.7 The switch shall offer network resiliency features per IEEE specifications such as Spanning Tree, Rapid Spanning Tree and Multiple Spanning Tree including the mechanism to ensure normal operations without impacting network convergence time. The switch shall optionally offer resiliency technologies for ring networks such as ERPS or similar.

20.8 The switch shall support advanced traffic management features including flow-based bandwidth control and broadcast/multicast storm control. Also, the switch shall support egress traffic bandwidth control with minimum granularity of 64Kbps.

20.9 The switch shall support QoS, ACL and Security based on both IPv4 as well as IPv6 parameters. The switch shall support sFlow and/or Netflow, LLDP, and ITU-T based OAM features in addition to time based ACL.

20.10 The switch shall support management through Web, CLI, SNMP, Telnet, TFTP and sFlow.

20.11 The switch shall support multiple firm wares as well as multiple configurations.

20. 12. 6U/9U Rack with Accessories UL certified with Power Strip and accessories

20.13. (A)Wifi & Switching: - COre Switch: - Chassis based switch with minimum 12 payload slots and additional 2 management/supervisor slots. Should have minimum 8 x 10G SFP+ ports

(B) DISTRIBUTION SWITCH: Chassis based switch with minimum 12 payload slots and additional 2 management/supervisor slots. Should have minimum 8 x 10G SFP+ ports.

1.1. NMS (NETWORK MANAGEMENT SYSTEM) : Should have perpetual license for management of up to 100 wired-devices. Offered solution should be scalable up to 1000 wired-devices.
Should allow automatic topology discovery and creation of network maps for layer 2 as well as layer 3 networks including all the available VLANs.

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SPECIFICATION FOR ACTIVE NETWORKING

NB:

1. All switches, fibre transceivers and NMS are to be of same OEM make and shall be covered under back-to-back warranty support from the same OEM to ensure full compatibility as well as inter-operability. OEM should meet the following criteria:

   a. Should have a 24x7 TAC based in India accessible through a toll free no.

   b. Should have a customs paid spares depot in eastern India.

   c. Should have presence in India for minimum up to 10 years.

2. OEMs for all active networking devices should have ISO 9001 and ISO 14001 certification.

3. OEM to submit declaration that offered products are not declared end-of-sale and manufacturer's submission in this respect to be submitted.

4. All active networking devices should have manufacturer's warranty and support with maximum 3 next-business-days onsite advance hardware replacement (inclusive of power supply and fans) and 24x7 software updates during the warranty period.

5. OEM should submit declaration for providing spares and support for 5 years from the date of acceptance by original buyer.

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(A) **CORE SWITCH**

Sl. No.	Description
1	Chassis based switch with minimum 12 payload slots and additional 2 management/supervisor slots.
2	Should have minimum 8 x 10G SFP+ ports.
3	Should have 24 x 1G UTP ports equally distributed across 2 payload modules. Should also have 24 x 1G SFP ports equally distributed across 2 payload modules.
4	Should support minimum 64000 MAC address entries and minimum 2000 VLANs.
5	Should be populated with redundant supervisor/management engines.
6	Should have required accessories for rack mounting.
7	Should have fully populated redundant hot-swappable power supplies (N+N configuration) and redundant fans.
8	Should have minimum backplane/fabric capacity of 2Tbps, minimum switching capacity of 1Tbps, and minimum packet forwarding rate of 744Mpps from day 1.
9	Should offer 80Gbps or higher bandwidth per each payload slot.
10	Should support UDLD or equivalent.
11	Should support dynamic routing protocols like OSPF and BGP from day 1.
12	Should support L2, L3 and L4 access control filters and should have complete IPv6 routing and management from day 1
13	Should have non-stop switching and routing or equivalent feature from day 1.
14	Should support MSTP, per-port QoS, minimum eight hardware queues per port, SP queuing or equivalent, cross-module link aggregation.
15	Should support management over GUI, CLI, RMON (minimum 4 groups), SNMP, andc sFlow/equivalent.
16	Should be capable of wire-speed policy enforcement for hardware-based, granular control of access and traffic to

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	protect, detect, and respond to network threats, with no network performance degradation
17	Should have monitoring different types of traffic with warning/alert/trap mechanism upon detection of anomaly caused by malicious attack (required hardware & software are to be provided from day 1).
18	Should be capable of taking advanced services modules for provisioning of Wireless management and BYOD features. Should have future integration support for WAN optimization, security, unified communication etc.
19	Should have RoHS compliance.

(B) DISTRIBUTION SWITCH

Sl. No.	Description
1	Should have 24 x 1G UTP ports with additional 2 x 10G SFP+ ports.
2	Should have required accessories for rack mounting
3	Should have minimum switching capacity of 88Gbps and minimum packet forwarding rate of 65Mpps from day 1.
4	Should have minimum 16000 MAC address entries and minimum 512 VLANs.
5	Should have IPv6 management readiness from day 1.
6	Should support UDLD or equivalent.
7	Should support L2, L3 and L4 access control filters from day 1.
8	Should support MSTP, per-port QoS, minimum eight hardware queues, SP queuing or equivalent, link aggregation.
9	Should support zero-touch configuration, RA guard, DHCPv6 protection, Dynamic IPv6 lockdown and BYOD HTTP redirect.
10	Should support management over GUI, CLI, RMON (minimum 4 groups), SNMP, and sFlow/equivalent.
11	Should have RoHS compliance.

(C) ACCESS POE SWITCH

Sl.	Description

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No.	
1	Should have 24 x 1G UTP PoE+ ports with additional 4 x 1G SFP ports. Should have a minimum PoE power budget of 365 watts.
2	Should have minimum 56Gbps switching capacity & minimum 41Mpps forwarding rate.
3	Should have required accessories for rack mounting.
4	Should have minimum 8000 MAC address entries, minimum 250 VLANs and minimum 8 IP interfaces.
5	Should have IPv6 management and routing readiness from day 1.
6	Should support UDLD or equivalent.
7	Should support L2, L3 and L4 access control filters from day 1.
8	Should support MSTP, per-port QoS, minimum four hardware queues per port, SP queuing or equivalent, and link aggregation.
9	Should support management over GUI, CLI, RMON (minimum 4 groups), and SNMP.
10	Should support power, fan, and temperature alarms
11	Should have RoHS compliance.

(D) NMS

Sl. No.	Description
1	Should have perpetual license for management of up to 100 wired-devices. Offered solution should be scalable up to 1000 wired-devices.
2	Should allow automatic topology discovery and creation of network maps for layer 2 as well as layer 3 networks including all the available VLANs.
3	Should have network inventory polling capability for IP network nodes, available line cards, modules, ports, physical

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	links, VLAN interfaces and all the other SNMP capable devices in the network.
4	Should allow extensive fault management with real time event and alarm notifications including system logs.
5	Should allow centralized creation and management of VLAN, QoS, and ACL policies.
6	Should have scheduled device configuration back-up and restore functionality.
7	Should have automatic detection of configuration changes for easy trouble shooting and isolation.
8	Should allow monitoring and management of 3rd party devices and end points.
9	Should have the functionality of scheduled configuration roll out.
10	Should have the functionality to perform scheduled or unscheduled network wide software or firmware upgrades.
11	Should have the ability to customize NMS dash board.
12	Should allow grouping of devices for applying any particular change/task.
13	Should include suitable service operation management flexibility for the network administrator to assign task to an Individual network engineer and assign ownership / track the status of the issue resolution in adherence to ITILv3.0. Should have service flow management from ticket creation, status checks, and execution to resolution, close, and after-audit operations
14	Should have 64-bit support.
15	Should support extending the NMS deployment to HA mode in 1+N redundancy configuration through optional add-on license/software in future.
16	Should support virtualization management
17	Should support role based access control
18	Should be FCAPS compliant.

1.2. **IP PBX WITH 50 EXTENSIONS**

04 Fxo & 100 SIP Extn features:
i) 04 Ports Fxo

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ii) 02 Ports FXs
iii) 100 SIP Extns
iv) 150 hrs voice mail
v) 12 party confrensing
Vi) Unified Messaging
V) All std features of PBX

1.3. IPPhone sets with PoE capable and with all slandered features like conferencing, call waiting etc. (Phone competable with Grandstream Ucm 6104)

1.4. Earthing: Terradyne electrolytic Grounding system/earthing pit 1.5" x 1.5mm x 10 feet deep vertical shaft poly plastic test well and back fill compound (2 bags) and terminating busbars as per specification as required

1.5. Back fill compound/Gel for pit filling or bonding strips (each bag weighs-22.5 Kg) for additional requirement at site as required.

21. TECNICHAL SPECIFICATION 2x15KVA UPS

CONTROL: Double Conversion Technology
Power Rating: 15KVA/ 12KW
Type: True online PWM IGBT based Double Conversion Technology.
Configuration: Parallel redundant load sharing with common battery bank of 01 hour battery bank back up on full load.

	2x15KVA UPS Specification
1.	CONTROL: Double Conversion Technology
2.	Power Rating: 15KVA/ 12KW
3.	Type: True online PWM IGBT based Double Conversion Technology.
4.	Configuration: Parallel redundant load sharing with common battery bank of 01 hour battery bank back up on full load.

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INPUT

5.	Nominal voltage: 380/400/415V (+27%,-15%) AC at 100% load.
6.	Nominal frequency: 50Hz (+/- 10%)
7.	Phase: 3 phase, 4 wire
8.	Current THD: ≤ 5%
9.	Power Factor: 0.9

DC/BATTERY

10.	Voltage: Each battery shall be rated 12V. Total VAH: 54000VAH of battery bank 01hour back up.
11	Voltage regulation:+/-1%
12.	DC RIPPLE VOLTAGE: <=1%
13.	TYPE/MAKE OF BATTERY: SMF VRLA type. Make Exide/Amaraja-Quanta.
14.	BATTERY BACK UP: 01 Hour back up.
15.	AUTO BATTER TEST FACILITY: UPS should have automatic battery test facility to know the health of battery bank, the test result should display in the LCD.

OUTPUT

16.	INVERTER: Sine Wave PWM Technology with IGBT as switching devices.
17.	POWER CAPACITY: 20KVA at 0.8 power

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factor.

18. VOLTAGE: 380/400/415VAC, 3phase+N+PE
19. Regulation: +/-1% for 100% unbalanced load
20 FREQUENCY: 50Hz +/-0.05 % in free running mode
21. WAVE FROM: True sine wave
22. THD:<=3% for 100% liner load
23. DYNMIC RESPONSE: For 0-100% step load changed the output shall remain within +/- 5% & recovery to 100% within 0 sec.
24. CREST FACTOR: 3:1 at 100% non-liner load
25. OVERLOAD CAPACITY: 125% For 10minutes, 150% for 1 minute.
26. Output of UPS should be 1 phases 4wired un balance type.

BYPASS STATIC SWITCH

27. AUTO TRANSFER AND RETRANSFER: Load transfer to bypass in cases of fault is cleared. The transfers automatically once the fault is cleared. The transfer and retransfer takes place in <5 milisec, in sync mode and < 20milisec, in a sync mode.
28. STATIC SWITCH RATING: 14 Times rated current for 10 milisec, 10 times rated for 100 milisec.
29. MAINTENANCE BY PASS SWITCH: 100% rated make before type switch should be used.

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PROTECTION

30. GALVANIC ISOLATION: UPS should have inbuilt double wound heavy duty isolation transformer at output.
31. INPUT: Input single phasing. Input under / over voltage. Negative phase sequence on input and bypass, RC surge suppressor.
32. BATTERY: Battery low, DC over voltage, battery current limit, Battery circuit breaker.
33. OUTPUT; Under / over voltage, overload, short circuit, Inv. Over temp, HRC fuses in control circuit, semiconductor fuse in power devices, and snubber circuit for dv / dt protection.
34. EMI / EMC PROTECTION: UPS Should have EMC / EMI protection.

DISPLAY

35. STANDARDS: SAFETY :EN 50091-1/IEC 62040-1-1 EMC:EN 50091-2/IEC 62040-2 DESIGN/ PERFORMANCE : EN 50091-3/IEC 62040-3

DISPLAY

36. LED DISPLAY: menu drive LCD panel provided or measuring all the parameters, check the status, function, maintenance and set up. Line flow

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diagram with LED indication should be provided.

37. ALARMS: AC failure, DC failure, Load on bypass, Battery test failure, over/under temperature, overload.
38. OPERATING TEMPERATURE: 0-40 deg C
39. COLLING: Forced air Cooling

GENERAL POINTS

40. MANNUAL: One no. of manuals for operation and maintenance in hard copy form.
41. Supplier has to install and commission the equipment at our site.
42. Warranty: 12 months from the date of commissioning against manufacturing defects or faulty workmanship.
43. The manufacturer should have his service center in Cuttack/Bhubaneswar for last 7years with toll free No.
44. User list along with detailed address and contact number of customer and customer's feedback report to whom similar equipment has been supplied to be submitted along with quotation.

22. PRECISION AIRCONDITIONING UNITS FOR SERVER ROOM / PATCH ROOM / NETWORK ROOM

1.0. Scope

- Scope of this section comprises the supply, installation, testing and commissioning of Precision Airconditioning Systems. The units shall be manufactured in a factory/production facility which is into manufacturing such PACs for at least last five years in India.

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1.1 Cabinet Construction

- The frame and panels shall be constructed of heavy gauge corrosion resistant sheet steel and have modular construction with railing and hinged doors. The cabinet shall be powder coated and have a textured finish. The cabinet shall be provided with double skin side panels with inner panel of minimum thickness of 0.8mm and outer panel of thickness of 1.0mm. Insulation in the side panels should be 19 mm thick glass wool. Front & Back panels should be insulated with 25 mm thick special acoustic mineral wool of CRAUSO Gmbh make.

1.2 Refrigeration Circuit

- The refrigeration system shall be of the direct expansion type and each unit must incorporate hermetic scroll compressors having independent evaporator coil circuit. Compressors will be with necessary protection devices and valves complete. The system shall include a manual reset HP control and an auto reset LP switch, filter drier and charging port. A thermal expansion valve, sight glass and filter drier shall be provided in each circuit. Additionally the system must be provided with vibration absorbers (MAKE) on the suction & discharge lines of compressor piping to minimize chances of any leaks due to compressor vibrations during start / stop cycle; this must be in addition to the anti -vibration mounts provided for the compressors.

1.3 Evaporator Coil (Dx)

- The evaporator coil shall be constructed of rifled bore copper tubes and louvred aluminium fins, with the aluminum/ GI frame. The A/V type of Coils shall not be provided due to their low Heat Transfer efficiency and difficulty in Servicing. The coil should be straight/ slant coil configuration and drip tray should be fabricated from heavy gauge steel with powder coating to avoid corrosion. The drip trays must be double angled for condensate flow and easily removable for

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cleaning. The cooling coil shall be of suitable rows deep and designed for high sensible cooling. The distance between the fins should not be less than 1.8 mm and the face velocity shall not be more than 2.75 m/sec.

1.4 Compressor

- The compressor shall be of the high efficiency complaint fixed scroll design with an E E R of not less than 11.1 BTUH/watt (C O P of not less than 3.25) at ARI rating conditions and of Copeland, Godrej or LG Make only. Each compressor shall have in-built overloads, HP and LP controllers and mounted on vibration isolators. Compressor can be single / double of the required capacity as per manufacturer standard. Crankcase heaters are not required as the compressor is mounted in the indoor unit. Compressors should be without Rota lock valves as Ball valves are provided in the refrigerant circuit for service purpose. The variable Speed compressors like Digital Scroll Compressors, used of Comfort Air Conditioning shall not be provided.

1.5. Vibration Absorber

- All units must have Vibration Absorbers in compressor suction & discharge lines to prevent cracks on high pressure copper pipe lines during start/stop cycle of the compressor.

1.6. Power Monitoring Switch

- All units must be provided with CE certified main power line supervisor switch to monitor under voltage / over voltage / phase reversal of incoming power supply. Provision of one common power monitoring device in electrical panel will not be acceptable. The switch provided must be of reputed make and complying with EU norms.

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1.7 Fan and Motor: ELECTRONICALLY COMMUTATED DRIVES

Fans: Unit must be provided with direct drive backward curved fans each running with DC drive electronically communicated motors, the fans should be aligned and balance statically and dynamically. Low efficient front curved fans which can generate only lower static pressures shall not provided. The EC Motors shall be with step less speed control. The fan speed must be controlled based on the room return air temperatures and also must have automatic speed control without manual intervention. The fans can be one /two/ three no's as per the manufacturer's standard. Units with latest innovative EC fan technology with "COMPOSITE "Blade material (Radical Fans) is required to have power saving. Composite blade EC fan saves more energy compared to Standard EC fan with aluminum blade. Units shall be factory balanced in accordance with Section 15071, Mechanical Sound and Vibration Control. Only direct drive fans to be provided in offered units and centrifugal fans with belt drive is strictly not acceptable. Noise Level: 70 db from 1 MT of unit in free filed conditions.

1.8 Accessibility: Service Area:

- The unit shall be accessed from front which will be enabling to access all the main components of the machine from the front for installation purposes and routine servicing. The unit shall be serviceable from the front with a maximum service space required of 1 mtr.

1.9 Elecrical Heating

- The electric heating elements shall operate at a level not exceeding 60 KW / sqm. The low watt density elements shall be of finned tubular nickel plated steel construction. The heating circuit shall include dual safety protection through loss of air and high temperature controls.

2.0 Humidification

- Humidity shall be achieved by using Immersed-electrode type humidifier by which steam shall be produced and the steam shall be distributed evenly into the bypass air-stream of the process cooling unit. The Humidifier operation should have periodic flushing cycle. The Humidifier should guarantee a perfect efficiency with low energy consumption and greater durability of components. The humidifier shall be fully serviceable with replaceable electrodes. Steam

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humidifier capacity 5 kg/hr with 3 phase electrodes having function of auto drain and proportional control for capacity complete with steam supply and water drain hose pipe.

2.1 De-Humidification

- De- Humidification to be achieved by controlling the evaporator fan speed.
  De- humidification done via split coil and solenoid valve is an out dated practice and not recommended for the latest generation Precision units.

2.2 Filtration

- Filtration level should be of 90% - 10 microns. Filter should be of HDPE media & washable type. Filters with combustible/dry disposable media are strictly not accepted.

2.3 Electrical Panel

Control cabinet to be provided with Type 2 enclosure, with grounding lug, combination magnetic starters with overload relays, circuit breakers and cover interlock, and fusible control circuit transformer.

- The electric panel provided for the unit must be equipped with main incoming power isolation switch, additionally the unit must be provided with under voltage / over voltage / phase reversal / single phasing protection, all three phase motors must be operated only via 24V coil voltage contactors and MPCB's, additionally step down transformer must be provided for power supply to the unit controller. The electrical panel must also be providing with relay block for common alarm.

2.4 Air Cooled Condenser

- The condensers shall be factory matched to provide an operating range of (-) 5 °C to 45°C ambient. Condensers shall be suitable for 24 hour operation and be capable of providing vertical or horizontal discharge. The condenser frame shall be constructed from heavy duty steel with powder coating to avoid corrosion and incorporate a copper tube and aluminium fin coil. The coil shall be a maximum of 6 rows deep, with a minimum fin spacing of 2.0 mm with a

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maximum face velocity of 3.6 m/s. The condenser fans shall be direct drive axial type operating at not more than 1440 rpm variable voltage electric motors. 6 pole 900 rpm fan motors will be used for low noise level applications. The Condenser fan speed control shall be based on head pressure of the refrigerant and not on ambient temp. The weight of the Condenser Shall not be more than 50 Kgs.

2.5 Electronic Fan Speed Controller for Condenser fans

The condensers must be provided with electronically controlled fan speed controllers, the speed of fans must be controlled based on Head Pressure. Pressure monitoring electronic switch must be suitable for application up to 12 Amps to take care of high motor amps.

2.6 Weight of the Indoor Units

The floor of the Server Room shall not be subjected to very high load due to the Precision ACs. The weight of the Indoor units shall not be more than 200 Kgs, keeping in mind the strength of the floor in the DC.

2.7 Micro Processor Controller

- Each Air conditioners should have single microprocessor with following controls :

2.8 Control Type

The controls shall be a microprocessor programmable logic controller. the controls shall have separate indication of operating modes (cooling, heating, humidifying and dehumidifying), alarm conditions (temperature high, loss of sensor, compressor hp & lp, wet floor, no air flow and low humidifier water). the display and indication shall be visible on the front without removing any external panels. local and remote alarms will be triggered if an alarm condition is reached. each unit must be provided with large screen graphical display and additionally the controller must have feature of dual set point programming.

- The control should have an auto-restart feature which will return the unit to normal operation resumption of mains power.
- Automatic load / time and alarm sequencing function to be performed by the unit.
- Microprocessor must have output point for ON/OFF of motorized damper and must be suitable to be integrated with fire point for unit shut off incase receiving signal from fire panel or fire detectors.

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- The unit controller must have option of { DUAL SET } point for energy saving i.e. customer must have the option to set two independent set points for the unit based on operational requirements and energy saving concepts.

2.9 Display:

In normal operating mode the screen should display unit number, temperature and relative humidity set points and actual, operating status. The unit must have a large screen LCD display on controller with user friendly menus and minimum two level password protections.

RS485 interface port for BMS compatibility with Mod Bus RTU protocol is required.

3.0 Alarms:

Following alarms should be available:

1. Temperature High / Loss of Sensor
2. Compressor 1 High / Low Pressure
3. Compressor 2 High / Low Pressure
4. Wet floor
5. No Air flow
6. Low Humidifier Water.
7. Temperature high / low
8. Humidity high / low

3.1 Safety Protections:

The unit shall also incorporate the following protections:

a) Single phasing preventers.
b) Reverse phasing
c) Phase unbalancing
d) Phase failure
e) Overload tripping (MPCB) of all components
f) Wet Floor Sensor

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3.2 Safety Interlocks:
Operation of heaters & humidifiers shall be possible only when blower fan is in operation.

3.3 Sequencing:
The sequencing should be feature of the PAC units. The units shall be designed to work for equal no of run hours also in case of fault the stand by unit should start.

Microprocessor Controls:
3.4 Following information shall be available on the display on the units:
a) Room temperature and humidity.
b) Supply fan working status.
c) Current date and time.
d) Electric heaters working status.
e) Manual / Auto unit status.
f) Temperature set point.
g) Humidity set point.
h) Working hours of main component i.e. fan, heater, humidifier
i) Unit working hours.
j) Modes of operation (cooling, heating, humidification, de-humidification,).
k) The last 10 intervened alarms.

3.5. The Microprocessor shall be able to perform following functions:
a) Password for unit calibration values modification.
c) Automatic reset of program.
d) Cooling capacity control.
e) Compressor starting timer
f) Date & time of last 10 intervened alarms.
g) Start / Stop status storage by switch

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Technical specification of Audio Visual System

1.0 Audio System

Flush Mountable Microphone Delegate Unit 50 cm or more

Digital signal processing, Flush mount Delegate unit should be Stylish, unobtrusive, low profile design Hygienic touch sensor technology, Shielded, GSM immune microphone, High quality integrated loudspeaker, Headphone output, Headphone volume adjustment, Loop-through, daisy chain cabling, Patent pending fail-safe redundancy feature, Concealed conference bus connections, Microphone LED ring, Bi-color bar indicator, Audio quality 16 bit digital Headphone load impedance > 32 ohm < 1k ohm ,Headphone Output power 16.5 mW / 32 ohm, Power Supply 48V, over Cat5 cable, Length microphone (mm) : 500 or more Color Black. (Make: Sennheiser / Televic /Apart)

1.1 Flush Mountable Microphone Chairman unit 50 cm and more.

Stylish, unobtrusive, low profile design,Hygienic touch sensor technology, Shielded, GSM immune microphone, High quality integrated loudspeaker,Headphone output,Headphone volume adjustment Loop-through, daisy chain cabling Patent pending fail-safe redundancy feature Concealed conference bus connections Microphone LED ring Bi-color bar indicator The chairman version comes with a priority and next-in-line function,Audio quality 16 bit digital Headphone load impedance > 32 ohm < 1k ohm Headphone Output power 16.5 mW / 32 ohm Power Supply 48V, over Cat5 cable), Lenght microphone (mm) : 500 or more Weight (g) 620 Color Black Weight (g) 620 Color Black The chairman version should be with a priority and next-in-line function.(Make: Sennheiser/Televic/Apart)

1.2 The Central Unit (Controller)

The Central Unit for Powering, configuring and Controlling connected Chairman, Delegate units, Stylish design, matching the contribution equipment Touch sensor button technology
Digital signal processing, Fanless, silent operation, Eco standy-by mode, Selectable voice activation (VOX),Fail-safe redundancy technology (Patent Pending), Default digital acoustic feedback reduction, For systems up to 50 units,

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Master/slave function to expand the system upto 3 units. It can take upto 150 delegate and chriaman units., Menus and integrated LCD System volume, On/Off button, Inbuilt USB Recording., Audio quality 16 bit digital Headphone load impedance > 32 ohm < 1k ohm, Headphone output power,16.5 mW / 32 ohm, Color Black (Make: Sennheiser/Televic/Apart)

1.3 Flush Mount for Chairman & Delegate Unit

Appropriate flush mount for above mentioned chairman & delegate microphones (Make: Sennheiser/Televic/Apart/Customized)

1.4 Wireless Handheld microphone with 12 frequencies.

Wireless handheld microphone with condenser Capsule offers brillant sound,High feedback rejection ,Mute button for full speech control, Synchronization via RF remote, channel ,Frequencies tunable in steps of 25 kHz,24 MHz bandwidth (13 MHz for the E band) 8 frequency banks with each max 12 presets. (Make: Sennheiser/Beyerdynamic/Shure).

1.5 Wireless Lapel microphone with 12 frequencies.

Wireless lapel microphone with Condenser Capsule offers brillant sound,High feedback rejection, Mute button for full speech control,Synchronization via RF remote channel,Frequencies tunable in steps of 25 kHz,24 MHz bandwidth (13 MHz for the E band) 8 frequency banks with each max 12 presets (Make: Sennheiser/Beyerdynamic/Shure)

1.6 Audio DSP

Audio DSP with 8 AEC mic/line inputs, 2 line inputs or more, 8 line output, USB port, unit shall be controllable through Ipad. (Make: Sennheiser/ Clearone/Biamp).

1.7 Wall Mount Speaker

4" small design cabinet loudspeaker, 8ohm/ 70watt, wall bracket and safety chain included, black (Make: Apart/JBL/Tannoy)

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1.8 Dual Channel Power Amplifier

Dual channel power amplifier with 215 watt @ 8 ohm or more per channel.(Make: Apart/Crown/ Labgruppen)

1.9 Video System

4000 lumens WUXGA Projector

Projector should have following features Display system 3 LCD system,Display device Size of effective display area 0.64” (16.3 mm) × 3, Aspect ratio: 16:10,Number of pixels 6,912,000 (1920 × 1200 × 3) pixelsAspect ratio 16: 10, Projection lens,Zoom Manual (Ratio: Approx. x 1.45),Focus Manual Lens shift Manual (Vertical: +/- 5%, Horizontal: +/- 4%),Throw Ratio 1.5:1 to 2.2:1, Screen size. Screen size 40” to 300” (1.02 m to 7.62 m)(measured diagonally),Light output (Mode: High / Standard / Low),Light output (Mode: High / Standard / Low) 4000 lm / 3200 lm / 2600 lm,Color light output (Mode: High / Standard / Low),Color light output (Mode: High / Standard / Low) 4000 lm / 3200 lm / 2600 lm. Contrast ratio (full white / full black),Contrast ratio (full white / full black) 2500: 1, Keystone correction Vertical: Max. +/- 30 degrees, Horizontal: Max. +/- 20 degrees, INPUT OUTPUT (Computer/Video/Control) INPUT A RGB / YPbPr input connector: Mini D-sub 15 pin female, Audio input connector: Stereo mini jack INPUT B / INPUT C HDMI input connector: HDMI 19-pin, HDCP support. S-VIDEO IN S-video input connector: Mini DIN 4-pin,VIDEO IN Video input connector: Phono jack
OUTPUT Monitor output connector*2: Mini D-sub 15-pin (female), Audio output connector*2: Stereo mini jack,REMOTE D-sub 9-pin (male),LAN RJ45,10BASE-T/100BASE-TX,USB Type-A, Type-B,MICROPHONE IN Mini jack.(Make: Sony, Barco, Christie)

2.0 Ceiling mount for above projector

Ceiling mount for above projector (Make: Customized)

2.1 65-inch Touch Display

65" touch screen display should have following features Native Aspect Ratio 16:9,Technology W-LED LCD, Resolution 1080p(1920x1080),Diagonal Size 65",Touchscreen Edge-to-edge IR multi-touch system with support for Windows 7/8

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gestures (PC only, single-point touch only for Mac). Glass protection, overlay for LCD surface. Picture in Picture Not Available,Refresh Rate 120 Hz,Speakers Integrated: Stereo 20W (2 x 10W),Connections HDMI, DVI, VGA (HD15 VESA), USB Type-A x 4, 3.5mm stereo audio in, 3.5mm stereo audio out, USB Type-B port for touch screen control. (Make: Infocus, LG, Samsung)

2.2 Wall Mount for above Display

Wall mount for above display (Make: Custom)

2.3 Interactive Software

Interactive Software for above display

2.4 Full HD video conference unit

Video Coference unit having following features, PC images up to 1080p resolution is supported PC images up to SXGA resolution is supported,Communication Protocol Standards H.261*2, H.263, H.263+, H.263++, H.264, H.264 High profile, MPEG-4 SP@L3 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 Input External video inputs (HDMI x 1, DVI-I x 2) Video Output HDMI x 2, DVI-I x 1,Control Input RS-232C x 1,Audio Input External analog microphone input Mini-jack (Plug in power) x 6 (L/R),HDMI (video, audio) x 1,Audio Input (MIC/AUX) x 2 (Phono jack, stereo) Audio Output HDMI (video, audio) x 1, Line Output (Phono jack, stereo) x 1, REC Output (Phono jack, stereo) x 1 Network Port 10BASE-T/100BASE TX/1000BASE-T x 2, ISDN Unit Interface x 1 USB Slots 2 (Pen Tablet, USB Memory),Maintenance Interface RS-232C x 1.(Make: Sony, Polycom, Lifesize)

2.5 Camera for VC with mounts

Camera having Image Sensor 1/2.8 Exmor CMOS, Image Sensor (Number of Effective Pixels) Approx. 2.1 Megapixels or more, Signal System 1080/59.94p,50p,29.97p,25p,1080/59.94i,50i 720/59.94p,50p,29.97p,25p,Minimum Illumination (50IRE) 1.8 lx (50IRE, F1.8, 30fps) S/N Ratio 50 dB or better, Gain Auto/Manual (0 to +43 dB),Shutter Speed 1/1 to 1/10000 sec(59.94 Hz system) or better,1/1 to 1/10000 sec(50Hz system),Optical Zoom 12x Digital Zoom 12x or more, Focusing System Auto/Manual, Horizontal Viewing Angle 71 degree(Wide),Focal Length f=3.9mm(wide) to 46.8 mm(Tele),F1.8 to 2.0,Minimum Object Distance 10 mm(Wide)~,1500 mm(Tele),Pan/Tilt Angle Pan: ±100° Tilt:

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±25°,Pan/Tilt Speed (Max.) Pan 300°/sec Tilt 126°/sec, Preset Position 100 (saved in codec unit) or better.(Make: Sony,Polycom,LifeSize)

2.6 Motorized Screen

Motorized Screen 137" inch, 16:10 aspect ratio, with LVC (Make: Custom)

2.7 Switching System

Cable Cubby

Cable cubby having one HDMI,one VGA, Audio, One Data, one power & PSTN connectivity. (Make: Extron/Kramer/JBE)

2.8. 4x4 HDMI Matrix Switcher

HDMI matrix switcher having 4 HDMI inputs & 4 Outputs, Supports computer video up to 1920x1200, including HDTV 1080p/60 or more, supported HDMI specification features include data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, and HD lossless audio formats or more, Speed Switch® Technology provides exceptional switching speed for HDCP-encrypted content, Key Minder® continuously verifies HDCP compliance for quick, reliable switching, EDID Minder® automatically manages EDID communication between connected devices, Includes LockIt® HDMI cable lacing brackets, RS-232 and RS-422 control port. (Make: Extron/Kramer/Crestron)

2.9 HDMI Audio De embedder

HDMI audio de embedder having HDMI audio de-embedding with analog stereo and digital S/PDIF audio outputs,Supported HDMI features include data rates up to 6.75 Gbps, Deep Color up to 12-bit or more,HDCP compliant,EDID Minder®,Automatic input cable equalization Comprehensive, real-time status LED indicators for troubleshooting and monitoring. (Make: Extron/Kramer/Crestron)

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3.0 VGA, Audio to HDMI Scaler

Scaler should have the following feature, RGB and HDTV component video scaling to HDMI, HDMI audio embedding, Selectable output rates up to 1920x1200, including HDTV 1080p/60 and 2K, Auto Input Format Detection. (Make: Extron/Kramer/Crestron)

3.0 Control System

Control Processor

Control processor with following specification SDRAM 512 MB ,Flash 4 GB, Memory Card supports SD™ and SDHC™ cards up to 32 GB, External Storage support USB mass storage devices up to 1 TB, 3 com port, 8 relay, 8 IR & 8 IO ports. (Crestron/AMX/Extron)

3.1. IR Probes
IR emitter probes (Crestron/AMX/Extron)

3.2 Wireless access point

Wireless access point with speed 300 Mbps and external Antenna(Motorola/Cisco/ Allied Telesis)

3.3 Lighting Controller

Lighting Controller should have following features four zone, capacity 2300W/VA, Dimmed light output 800W/VA (Lutron/Crestron)

3.4 Touch Panel with Control App & Sleeve

IPAD , 16 GB wifi , control app and sleeve (Make: Apple + Crestron/AMX/Extron)

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3.5 Other System

AV Equipment Rack

24 U , 19" rack with rack plate, fan & casters (Make: MTS/Valrack/President)

3.6. Cables& Connectors

Cables and connectors for above equipment (Make: Extron/Kramer/MX/Flacon)

Implementation, Designing & Programming

3.7. Power Backup

10 KVA Online UPS with Isolation Transformer. Single phase input / single output with 30 min backup (Make: APC / UNILINE/ Paradyne/Emerson)

TECHNICAL SPECIFICATION FOR ELECTRICAL WIRING

1. GENERAL REQUIREMENTS :

The installation shall generally be carried out in conforming with the requirements of the Indian Electricity Act, 1910 as amended up to date and the Indian Electricity Rules, 1965 framed there under, the relevant regulation of the Electric Supply Authority concerned, and also with the specifications laid down in the Indian Standard I.S. 732-1963 Code of practice (revised for Electrical Wiring Installations (system voltage not exceeding 650 volts) and I.S. 2309-1962 Code of Practice for the protection of buildings and Allied Structure against Lighting and IS 3043 - Indian Code of practice for Earthling. The wiring shall also be according to the specifications of P.W.D. of the Local Government.

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2. MATERIALS :

All materials, fittings, appliances, used in electrical installations, shall conform to Indian Standard Specifications wherever these exist. A list of approved materials is attached afterwards. Materials not included in the list shall be got approved by the Architects / Engineer-in-charge / Owner prior to actual use.

3. MAIN SWITCH GEAR :

Iron clad switch fuse and isolator units should conform to B.S. 861 (I.S. 2510-1954). The quick made and break mechanism shall be self interlocked with the cover. In “Off” position there must be two breaks per pole.

Main switch gear shall be properly earthed with two numbers conductors if M.V. and one number of L.V.

4. BUSBAR CHAMBER (BBC) :

This shall be totally enclosed, metal clad type fabricated from rust proofed 14 SWG sheet steel on angle iron frame and provided with sheet or cast iron cover and undrilled detachable and plates, suitable for mounting angle iron floor stand and painted with high quality enamel paint. G.I. bolts and nuts shall be used for assembly with suitable packing materials to ensure dust proof finish. Meters shall be provided on suitable sheet steel boxes. Switch shall be provided with cable and boxes as required.

The depth of B.B.C. shall be 150 mm (minimum). Minimum clearance of phase bars to earth shall be 25 mm and between bus bars shall be minimum 32 mm.

H.C. (High Conductivity) copper bus bars properly tinned are to be rated at 1000 amps. per sq. in and aluminum bus bars (wrought aluminum alloy strip) conforming to relevant I.S. specification at 800 amps per sq. in.

Neutral Bus bars are to be rated to carry 60% of phase current. These shall be carried on glazed porcelain supports of proper dielectric and mechanical strength and shall be appropriately colour coded for identification of phase.

Lettering shall be done for identification of switches as directed. The contractor shall submit fully dimensioned Tendered Drawing of the board with the physical position of the switches and other components to the Architects for their approval before the same is fabricated.

There shall be two numbers of Earth Terminals Suitable Danger Board shall be provided.

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5. INTERCONNECTION B.B.C. & SWITCH FUSE, METERS :

For ratings above 150 Amps these shall consist of insulated copper strips to adequate section. For ratings below 150 Amps PVC copper cable tails of appropriate size, terminating in tinned copper sockets may be used. The above are to be enclosed either in sheet metal trunking or conduits so that no part is exposed.

6. DISTRIBUTION BOARDS :

These totally enclosed metal clad type Distribution Boards with hinged lids shall be in accordance with I.S. 2147-1952 and 2675-1966 and B.S. 214 and shall be welded construction and fabricated from rust proofed sheet steel and finished with anticorrosive stove enamel paint and have provision for fixing on wall and having earthing terminals. Main Power DB shall be free standing floor mounting type and branch DB shall be wall mounting type.

Power Distribution Boards (400 volts TPN) shall be constructed from 14 SWG sheet steel and Branch Distribution Board (230 volts SPN from 16 SWG sheet steel).

The minimum ratings of phase and neutral bus bars shall be 67% of the total ratings of fuse ways. Above 32 Amps Neutral Busbars may be half the size of the phase Bus Bars.

The fuses shall be mounted on glazed porcelain supports of proper dielectric and mechanical strength. TPN suits should have phase separation barriers between fuse N.L.U.Os.

Cables shall be connected to a terminal by crimped lugs.

Where two or more B.D.B.'s feeding low voltage circuits are fed from different phases of a medium voltage supply there B.D.B.'s shall be installed at least two meters apart.

All three phase power distribution boards shall be properly earthed with two number 10 S.W.G. galvanized iron wires and provided with suitable Danger Boards. All SPN B.D.B.'s shall be properly earthed with one number 10 SWG galvanized iron wire each.

Branch DB (LDB) :

- The incomer to the LDB shall be terminated in a suitable rated TB (not directly on ELCB/MCB).
- The size of the DB shall have space for comfortable accommodate all MSBs, ELCB, TB and have space for minimum 2 no's of spare MCBs.

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- All MCB shall be min 9KA rating and ‘C’ curve type.

7. SWITCHES :

All switches for lights, fans and plug points shall be Modular type switches, unless specified otherwise.

8. CABLES AND CONDUCTORS :

All cables shall conform to relevant Indian Standard. Conductors of all cables except for flexible cables, shall be of aluminum, unless specified otherwise. All LT cable shall be FRLS type PVC insulated and 1000 V grade.

9. FLEXIBLE CABLES :

Conductors of flexible cables shall be of PVC insulated FRLS copper the minimum size of core acceptable is 1.5 sqm. (other than telephone cable). The maximum weight to which the following twin flexible cords may be subjected are as follows :

Twin 16 / 0.20 mm	:	3.3 Ibs (1.5 Kgs.)
Twin 23 / 0.0076 inch	:	5.0 Ibs (2.3 Kgs.)

10. INSTALLATION OF MAIN SWITCH BOARDS, BDB’S MAINS, SUBMAINS, DISTRIBUTION WIRING TO INDIVIDUAL POINTS :

The exact positions of all main switch boards, BDB’s and all funds of mains and sub-mains, and distribution wirings to individual points including the exact position of all light fittings and switch boards shall be first marked on the buildings and shall be approved by the Engineer in charge before actual commencement of the work.

The D.B.’s shall be generally be installed at a height of 2.13 m (7 ft) from floor level.

11. INSTALLATION OF SWITCH BOARDS :

These shall be installed at a height of 1.3 mtrs. (4’ - 3”) and above the floor level.

12. INSTALLATION OF CEILING FANS :

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Unless otherwise specified all ceiling fans shall be hung not less than 2.75 M (9 ft.) above floor. The suspension and clamp shall be painted with approved paint without involving extra cost.

13. INSTALLATION OF FLUORESCENT LIGHT FITTINGS :

Where these are suspended from ceiling by two down rods, or fixed to ceiling / beam directly, at least one fixing to the ceiling / beam shall be made with Mechanical / Metal fasteners. Electrical drill only shall be used while making holes for the fasteners which shall be capable of sustaining at least 11 kg. of dead weight.

The down rods and accessories shall be painted with approved paint without involving extra cost.

Unless otherwise specified these should be suspended 2.60 m (8'-6") above the floor.

The Fluorescent light point/ Ceiling fan point and exhaust fan point shall be terminated in a ceiling rose and at the time of equipment/ fitting installation it is to be connected with the ceiling rose. The connection (supply and erection) is in the scope of contractor installing the light/fan fittings.

14. INSTALLATION OF EXHAUST FANS :

Exhaust fans shall be fitted by means of rag bolts embedded in the wall. The required holes in the wall shall be made and finished neatly with cement plaster and brought to the original finish of the wall. All exhaust fan shall be fitted with GI Louvers at the outer side.

15. INSTALLATION OF SOCKET OUTLETS :

No socket outlet shall be provided in the bath room at the height less than 130 cms. (4'-3") from the floor.

No switches shall be provided inside the bath rooms, unless approved by the Engineer in charge.

Socket outlet at locations other than bath rooms shall be either 25 cm (10") or 130 cms (4'-3") from the floor.

16. INSTALLATION OF ELECTRIC MOTORS :

Electric Motors shall be earthed with 2 numbers of earthing in opposite side. Earth flat is to be brought near the equipment and then connected by wire rope socketed at the ends.

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17. TESTING OF INSTALLATION :

Before a completed installation or an addition to an existing installation is put into service, the following tests shall be carried out by the contractor in presence of the Engineer-in-charge.

(a) Polarity of switches :

It must be ensured by test that all single pole switches have been fitted on the live side of the circuits they control.

(b) Insulation test :

(i) By applying a 500 volt megger between earth and the whole system of conductors or any section thereof, with all fuses in place and all switches closed, all lamps in position or both poles of installation otherwise electrically connected together. The result in meghom shall not be less than 50 divided by the number of points on the circuit, and should not be less than 1 meghom.

(ii) Between all conductors connected to one phase and all conductors connected to the neutral or to the other phase conductors of the supply after removing all metallic connections between the two poles of the installation and switches on all switches. The insulation resistance shall be as in (I) above.

(c) Earth Continuity Test :

The earth continuity conductor including metal conduits, and metal sheaths of cables in all cases shall be tested for electrical continuity. Electrical resistance of the above along with the earthing leas cut excluding any resistance of earth leakage circuit breaker, measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

(d) Earth Resistance Test :

To ensure effectiveness of installation earth, the value of earth resistance shall within 5 0hm for installation capacity upto 5 KW and one ohm for installation of higher capacity.

18. The completed work will be taken over only if the result obtained in above tests are within the limits mentioned above and in accordance with I.E. Rules.

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On completion of the installation work, a certificate shall be furnished by the contractor, countersigned by the certified supervisor under whose direct supervision the installation was carried out. This certificate shall be in a prescribed form as required by the local Electric Supply Authority.

19. SPECIAL SPECIFICATIONS :

(a) Before fixing all switches, fittings etc. should be produced before Engineer in Charge and get approved.

(b) All metal switch boards and switch / regulator boxes to be used in work shall be painted with two coats of anti rust primer (red oxide paint) prior to erection. After erection they shall be again painted with two coats of enamel paint of approved quality.

(c) Before execution of any portion of conduit work for wiring neat proper layout should be made out by the contractor and got approved from the Engineer-in-charge. For this purpose contractor is advised to get acquainted with the layout Tendered Drawings of the Consultant / Architect.

(d) While laying the conduits for concealed wiring in the ceiling or in the beams and columns and before casting the contractor must ensure that all the inlets and both ends of the conduits are plugged by means of dead end socket so that no foreign matter can enter the conduits and choke them.

(e) Damage to any fitting during erection and before handing over the installation by contractor shall be set right or replaced by the contractor at his own cost.

(f) Caution Board or proper size wherever required, shall be provided, as per I.E.E. regulations for which no extra payment will be admissible.

(g) Any repairs done to wall etc. should match with the surrounding surface otherwise same will be got done through Building Contractor at the cost of the Electrical Contractor.

(h) Earthing installation shall be done in the presence of Engineer-in-charge or his representative.

(i) The installation should not be enertized without adequate earthing.

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(j) The I.C. switches and Distribution Fuse Boards shall be provided with neat lettering in block letters with paint for identification of the I.C. switches and for the points connected to each fuse way of the D.B.'s for which no extra payment will be admissible.

(k) Completion Tendered Drawings.

The contractor shall be required to submit along with Final bill, the under noted Tendered Drawings on tracing papers, along with three copies of Ammonia print each.

(l) Plan (as per structural Tendered Drawing) of each floor (not less than 1 : 100 metric scale) showing :

(i) Locations of Main Switch Board, Distribution boards (with the circuit numbers controlled by them).

(ii) The runs of mains and sub-mains.

(iii) Location of lights, fans wall sockets, other power consuming devices together with type of fittings and fixtures including circuit numbers.

(iv) Position of lighting conductors and route of running conductor.

(v) Position of Earthing Stations for light and power and Lighting conductor installation.

and giving the following information's on the plans :

(a) Name of work with job no. Accepted Tender No.

(b) Date of completion.

(c) Name of the place.

(d) Name and signature of the Contractor.

(e) Scale of Tendered Drawings.

2. Schematic line layout diagram of each floor showing (i) layout and connections of Main and Sub-board, B.D.B. having descriptions of the size, capacity, type and their numbers the system and the source of supply, (ii) Location, size, type, length of main and sub main cables (iii) Loading of each B.D.B indications of phases, Departmental mark in each B.D.B. and switchgear.

The Tendered Drawings shall be very neatly drawn and submitted properly without folding them.

3. Cable route should be marked on site plan with measurements from permanent structures.

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TECHNICAL SPECIFICATION FOR CONDUIT WIRING SYSTEM

1. Type and size of conduit :

All conduit pipe shall be screwed type, solid drawn or welded and with black stove enameled surface or galvanised and of thickness conforming to IS : 9537 part II of 1981 (or latest revision) in all respects. The conduits are to be free from burrs and internal roughness. No conduits less than 20 mm in dia shall be used, unless specified.

2. Accessories :

Only screwed type of accessories are to be used.

3. Conduit Joints :

The conduit shall be properly earthed. In long distance straight runs of conduit either inspection type screwed couplers are to be provided at reasonable intervals on running threads with couplers and jam nuts. Threads on conduit pipes in all cases shall be between 13 mm to 27 mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut end of conduit pipes shall have no sharp edges or any burrs left to avoid damage to insulation of conductor while pulling them through such pipes.

4. Protection against dampness and rust :

In order to minimize condensation and sweating inside the tube, all outlets of pipes system shall be properly drained and ventilated, but in such a manner as to prevent entry to insects inside the conduit.

To protect against rust the outer surface of the conduit and accessories shall be painted and the bare thread portion is to be portions with anti corrosive preservative.

5. Fixing of Conduits :

conduits pipes shall be fixed by heavy gauge saddles and h.w. or metal bars, secured to wall / ceiling by screws driven into wood plugs or rawl plug or phil plugs at an interval or not more than 76 cm apart for vertical run and 60 cm apart for

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horizontal run, but on other side of couplers or bend or similar fitting saddles shall be fixed at distance of 30 cm from the center of such fittings. The minimum thickness for saddles shall be 24 SWG, for conduits upto 25 mm dia and 20 SWG for larger sizes.

6. Bends in conduits :

All necessary bends in the system including diversion shall be done bending the pipes, or by inserting suitable inspection type bends, elbows or similar fittings, or by fixing cast iron inspection boxes whichever is most suitable.

7. Outlets :

All outlets for fittings, switches etc. shall be fixed on boxes of suitable metal for either surface mounting system or flush mounting system. In case of cast iron boxes the wall thickness shall be at least 3 mm and in case of welded mild steel sheet box of wall thickness shall not be less than 16 gauge. Except where otherwise stated 3 mm thick insulated laminated sheets shall be fixed on the front with screws. Where conduits are terminated. Special care shall be taken in employing double jamnuts, special care shall be taken in employed double jamnuts, for securely fixing conduits to outlets so as to prevent any possibility of damages to cables when drawn.

8. Cables to be used :

Unless stated otherwise only single core PVC insulated cables of approved manufacturers shall be used for wiring in conduit shall not be greater than maximum set out in Table II of Indian Standard (I.S. 732-1963) code or practice (revised) for electrical wiring installation (system voltage not exceeding 650 volts).

9. Looping in system :

Distribution wiring in conduit to light, fan plug points etc. shall be done in looping system. In this system no joints or connections shall be made anywhere of the system except at terminating points such as at terminals of switches, ceiling roses, etc. and in case of socket outlets at the socket terminals.

10. Earthing continuity wires :

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All three pin 5 Amps plug points and metallic fan regulator cover should be provided with earthing attachment by No. 14 S.W.G. wires, unless specified otherwise.

Three pin 15 Amp power plug point should be provided with earthing attachment by No. 14 SWG G.I. wire, unless specified otherwise.

For conduits and accessories for distribution wiring should be provided with earthing attachment by number 14 SWG G.I. wire, unless specified otherwise.

For looping earthing G.I. wire shall be run conduits being fixed with saddles, this wire shall not be normally visible after installation when run with the conduit. Where the wire has to be ;taken without ;the conduits this will be fixed with “U” nails at 2’-0” intervals.

11. Painting :

Conduit and all conduit fittings and accessories shall be painted with two coats matt paint. Painting of conduits shall be done to harmonize with colour bearing surface, i.e. wall, joints, trusses etc. after installation and as approved by the Engineer-in-charge.

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TECHNICAL SPECIFICATION FOR
CONCEALED CONDUIT WIRING SYSTEM

1. Concealed conduit wiring system shall comply with all requirements for surface conduit wiring system as specified above and in addition conform to the requirements specified below :

2. Making of Chase :

   The chase in the wall shall be neatly made and be of ample dimensions to permit the conduit to be fixed in the manner desired.

3. Fixing of Conduit in Chase :

   The conduit pipes shall be fixed by means of staples, J-Hooks or by means of saddles not more than 60 cm apart. Fixing of standard bends or elbows shall be avoided as far as pipes with a long radius which will permit easy Tendered Drawing in of conductor. All threaded joints of metallic conduits shall be treated with some approved preservative to secure protection against rust.

4. Inspection Boxes :

   Suitable inspection boxes shall be provided when necessary to permit periodical inspection and to facilitate removal of wires. These shall be mounted flush with wall.

5. Types of accessories to be used :

   All outlets such as switches, socket outlets, shall be flush mounting type with cast iron or M.S. boxes with a cover of approved insulating materials. The switches and other outlets shall be mounted inside such boxes as would be approved. The metal box shall be efficiently earthed with conduit by means of earthing attachment with No. 14 SWG G.I. wire, running inside the conduit.

6. Conduits :

   (i) Steel-Black enameled screw type M.S. conduits with thickness conforming to IS : 9537 part II or 1981 (or latest revision)

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(ii) PVC / Polythene-Medium gauge pipes of reputed make having 3 mm wall thickness shall be used.

For roof slabs - These shall be prelaid during casting of floor / roof slab. No. of wires drawn through the same shall not exceed the number of specified I.S. code.

For vertical drops in wall to switch boards-Minimum size shall be 13 mm bore through which not more 2 Nos. 1/1-40 and G.I. earth wire shall be drawn.

(iii) Maximum capacity of conduits for Tendered Drawing in of PVC insulated cables shall be as follows :

650 / 1100 V PVC Copper wire.	In 20 mm dia. Conduits.	In 25 mm dia. Conduits.
1.5 Sqm.	4 Nos.	10 Nos.
2.5 Sqm.	4 Nos.	10 Nos.
4.0 Sqm.	3 Nos.	8 Nos.
6.0 Sqm.	2 Nos.	6 Nos.
10 Sqm.	-	4 Nos.
16 Sqm.	-	2 Nos.

7. Fish wire - 18 SWG G.I. wire shall be used and it shall protrude the conduit ends by 9 inches.

8. Conduit laying in floor / roof slabs before casting :

PVC / Ploythene / G.I. conduit shall be laid straight as far as practicable and properly placed including binding with the steel reinforcement rods with 22 SWG G.I. wire so that proper positions of conduits are maintained.

While laying the conduits for concealed wiring in the ceiling or in the beams and columns and before casting, the contractor shall ensure that both ends of the conduit are plugged by means of dead-end socket or otherwise so that any foreign matter cannot enter the conduit and choke them.

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All precaution must be taken while laying the conduits on the slabs, R.C. walls, columns etc. and the contractor shall rectify at his own cost if any defects are found during process of Tendered Drawing cables through the concealed pre laid conduits.

Each PVC / Polythene conduit shall be provided with protruding length of not less than 9 inches on free end of the conduits.

There shall be no intermediate joints in one straight run of conduit.

All ceiling outlets shall be terminated in a round C.I. / G.I. circular box / deep box to suit standard size ceiling rose or / and rectangular C.I. / M.S. junction box or fan hook box as the case may be.

It will be mandatory for the contractor to get the layouts approved by the Engineer-in-charge / Architect when the conduits are laid and bound to steel reinforcement rods, before he can release the work for casting of floor / roof.

9. Connector Boxes, Draw-in-Boxes, junction Boxes :

These shall be constructed from 16 SWG M.S. sheet and have M.S. cover. Minimum size for connector boxes in 6" x 4" and for Draw in Boxes 4" x 4".

10. Fan Hook Boxes :

These shall be 100 mm (4") dia x 75 mm (3") deep, constructed from 16 SWG M.S. sheet, and provided with one 12 mm dia M.S. rod 300 mm (12" long).

11. Painting :

outside of wall switch boards, connector boxes and draw-in-boxes and other C.I. / M.S. accessories shall be painted with two coats of anti-rust paint in addition to other painting instruction given elsewhere.

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TECHNICAL SPECIFICATION FOR CABLE INSTALLATIONS

1. General :

All HV cables (up to 33 KV earthed system) shall be XLPE insulated aluminium conductor cable conforming to I.S. 692 and I.S. 7098 respectively.

All medium voltage and Low Voltage PVC insulated FRLS type and armoured / unarmoured cables shall conform to I.S. 1554 Part-I-1964 and of 1100 volt grade.

Old and used cables must not be used for installation. Only one make of cable shall be used. All cables brought to site must be tested and got approved by the Engineer-in-charge before these can be laid. The cables shall be dispatched to site on wooden drums with ends sealed. Exact lengths shall be determined by the Contractor after measurement at site.

The underground installation of cables shall be generally conforming to I.S. 1255-1967, Code of practice for installation and maintenance of underground cables (upto including 33 KV).

2. Laying of cables :

(a) Direct in Ground :

Trenches shall be 750 mm deep (minimum) for LT cables and 1.2 M (4'-0") deep minimum for HT Cables from ground level and trenching work shall including all pumping and bailing out water. These trenches shall be wide enough to accommodate all the cables with brick separations as per the requirements specified in the relevant I.S.

When more than one multicore cable is to be laid in the same trench, a minimum horizontal interaxial spacing between cables will be as per relevant I.S.

After excavation of the trench of proper size, the bottom of the trench shall be dressed and leveled and filled with 75 mm layer of fine sand. The cable shall then be laid with bricks on both sides of the cable continuously. After having the space within the bricks, filled and packed up to a level of 75 mm (3") above top of cable with fine sand, the top layer of bricks shall be placed side by side in continuous series as protective cover. Total No. of bricks required being 16 per metre run. The remainder of the

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trench shall be filled with riddles soil, well rammed and watered to a level of 75 mm (3'-0") above surrounding ground level. The ground level surface of the whole trench route shall be restored properly after completion of cable laying.

(b) Inside Building :

Cables shall be laid on walls / ceilings / structure, unless specified otherwise with M.S. brackets and suitable clamps or over claw type aluminum cleats fixed on M.S. brackets, spaced not more than 450 mm apart. G.I. Bolts of suitable sizes are to be grouted on the wall properly for fixing the brackets.

(c) Minimum bending radius permissible in 120 for MV cables and 20d for HV cables. At joints and terminations the individuals core of multicore cables should never be bent so that the radius is less than 15 times the diameters over the insulation.

No cable jointing is allowed between two terminals points.

3. Cable Jointing :

All cable joints shall be carried out by experiences and Licensed jointers under strict supervision. Electro plated brass cable glands, aluminum / tinned copper cable sockets and approved jointing materials must be used. The price for cable jointing and finishing the ends of the cable shall include all materials and shall also provide for tools and plants for the work. The cable accessories and other associated materials shall conform to Indian Standard Specification where applicable. Proper earthing of cable glands and armoured shall be included in the job.

4. Testing of Cables :

All cables shall be tested for insulation resistance with megger - 5000 V constant pressure meter insulation tester for HT cables and 1000 V constant pressure megger for LV cables, before installation.

After installation and end termination, cables shall be again subjected to the above test. Insulation value for HT Cables shall not be less than 100 mega ohms and for MV Cables 1.0 mega ohm.

After laying and jointing, the HV cables shall be subjected to high voltage pressure test before commissioning the test voltage being as specified in I.S. 1225-1967 or latest.

5. Testing of Installation :

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Before the completed installation is put into service or handed over to owner, the installation is to be subjected to the above tests to the satisfaction of the Engineer-in-charge. The completed work will be taken over only if the results are acceptable to the Architects / Owner.

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TECHNICAL SPECIFICATION FOR EARTHING INSTALLATION

The installation shall generally conform to I.S. 3043-Indian Standard Code of practice for Earthing, as amended upto date.

1. Earthing Electrode :

The earthing electrode shall be galvanized steel pipe of class B medium quality 50 mm (2") dia bore and 3.04 M (10") long. A hole shall be provided at 100 mm (4") from the top end to receive a 13 mm (1/2") dia galvanized bolt and the bottom end shall be chisel cut for easy penetration into soil.

A suitable trench shall be excavated about 0.45 M (1"-6") deep and the pipe electrode driven to an average depth of 3.35 M (1"-0") below ground level. The top end of the electrode shall be at an average depth of 3.30 M (1") below the ground surface. Alternate layers of Charcoal or Salt and coke to be provided for Electrode as per I.S. code of Practice unless specified otherwise.

One No. SWG G.I. wire (unless otherwise specified) shall be connected securely on the properly cleaned surface at the top end of pipe electrode by means of a 100 mm (4") long x 13 mm (1/2") dia G.I. bolt nut and double washers. The earth lead conductor shall be protected mechanically be means of a continuous length of G.I. pipe (Class A) having 13 mm (1/2") inside diameter upto a height of 0.60 M (2') above ground and the same shall be completely filled with bitumen compound and topped upto overflowing.

2. Masonry Inspection Pit :

The inspection pit for the earth station shall be approx 0.56 M x 0.56 M (1'-10" x 1'-10") outside dimensions and approx. 0.45 M (1'-6") deep when completed, having 5" thick cement brick work with 1st class bricks in cement mortar (6 : 1) both inside and outside plastering 19 mm (3 / 4") thick and neatly cemented 1.60 mm (1 / 16") thick, both inside, outside and top. The opening on top shall be provided with a C.I. ring with lockable cover fixed flush with ground surface.

All the excavations shall be duly back filled, dressed and rammed.

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3. Locations for Earth Electrodes :

Electrodes shall be buried at least 2 M (6'-6") away from the building pole or object to be earthed. However, earthing electrodes for L.C. installations should be as clode to the down conductors as possible.

Electrodes when installed in parallel, shall not be placed less than 2 M (6"-6") apart and preferably placed at distances greater then twice their lengths.

4. Earth Bus bar :

(a) Galvanized M.S. Flat :

The Bus bar shall be of suitable size and length, as specified in the Schedule of items, heavily galvanized and having adequate number of drilled and tapped holes 30 mm apart, completed with G.I. bolts, nuts, washers for securely connecting the earth leads and earth continuity conductors. The bus bar shall be fixed on wall, having clearance of 6 mm from wall with spacing insulators with at least the numbers 13 mm (1/2') G.I. rag bolts spaced about 0.46 M (1'6") apart.

(b) Copper Flats :

To be used, as specified, in the Schedule of Items, where earthing requirement are more stringent. Brass bolts, nuts washers shall be used for connections.

5. Value of Earth Resistance :

In case of installations where the load does not exceed 5 K.W. the resistance to earth shall on no account exceed 5 Ohm for other cases the resistance shall not exceed 1 ohm.

For sub-station, the value is 1 ohm.

For L.C. installations the value is 1 ohm.

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SECTION - XIV

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LIST OF MATERIALS OF APPROVED BRAND AND / OR MANUFACTURERS

SL. NO	PRODUCTS	BRAND	GRADE	TECHNICAL SPECIFICATION
1	PLYWOOD	HIPPO/TRUWOOD/ GREEN CLUB/CENTURY ARCHITECT/TAJ	IS 710	Plywood should be phenol bonded with 11 layers of core veneer of gurjan timber and two layers of face veneers with thickness of 0.5mm confirming to IS 710.
2	FLUSH DOOR	HIPPO/TRUWOOD/VISHAL /CENTURY	IS 2202	Flush doors frames should be of pine timber without any joint and filler should be of red miranti hardwood all seasoned and chemical vacumm treated and core, face veneer bonded with phenol formaldehyde confirming to IS 2202 part I
3	LAMINATES	ROYAL TOUCH/ MERINO/SONEA/ASIS	IS 2046	Laminates should be of 1mm/1.25mm thick confirming IS 2046
4	PRE LAMINATED BOARD	ACTION TESA/ NOVANPAN/BHUTAN BOARD/CROSS BAND/ASIS	IS 12823	Particles should be of wood based and of uniform structure bonded with urea formaldehyde.
5	BLOCK BOARD	HIPPO/TRUWOOD/GREEN CLUB/CENTURY ARCHITECT/TAJ	IS 1659	Frames and all the filler should be of pine wood, seasoned and chemically treated and the core veneer should be of gurjan timber and bonded with phenol formaldehyde confirming to IS 1659
6	DECORATIVE VEENER	TRUWOOD/GREEN/CENTURY/ARIN	IS 1328	The decorative veneer on top surface should be min 0.6mm thickness and uniformly sanded and the base ply should be of gurjan timber and all face veneers bonded with phenol formaldehyde confirming to IS 1328
7	ADHESIVES	ROYAL BOAD AND EQUIVALENT	IS 4835	Polyvenyle Acetate dispersion based adhesive.
8	GYPSUM FALSE CEILING	USG-BORAL/SAINT GOBIN		12.5mm thick Gypsum board
9	GRID CEILING	ARMSTRONG/USG/EQUIV ALENT		

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10	METAL CEILING	ARMSTRONG/ TECHNO/EQUIVALENT		
11	WOODEN/ LAMINATED FLOORING	ACTION TESA/EURO/PERGO/ARMS TRONG		8mm thick laminated HDF flooring of AC4 grade
12	WATER ROOF CEILING	HILUX/ EVERST/SHERA	IS 14862	
13	ACCESSES FLOORING	EVEREST /LABAN/EQUIVALENT		
14	METAL CEILING SECTION	USG-BORAL/SAINT GOBIN/DIAMOND		Ceiling section, perimeter channel, ceiling section should be of .55mm thickness GI frame and intermediate channel should be of 0.8mm thickness.

SL.NO.	DESCRIPTION	MAKES
2.	ALUMINIUM DOOR FRAME	JINDAL/OEL / HINDALCO
3.	FLOOR SPRING	DORMA/ DOORSET/LINK
4.	SS HANDLE	GODREJ/ DOORSET/LINK/OZONE
5.	SS 304 MORTICE LOCK	GODREJ/ DOORSET/LINK/DORMA
6.	DEAD LOCK	GODREJ/ DOORSET/LINK
7.	SS 304 CONCEALED TOWER BOLT	GODREJ/ DOORSET/LINK/ARK/OZONE
8.	SS 304 DOORS STOPPER	SS 304 ISI MARKED
9.	DOOR SILENCER	P.V.C OF APPROVED MAKE
10.	GLASS	MODIGUARD / SAINT GOBIN / AIS FLOAT/ SARAF
11.	SS 304 BALL BEARING HINGE	HAFLE/ DOORSET/ AKS
12.	SS SCREW	H.F. BRAND
13.	LEAPING	1ST QUALITY TEAK WOOD
14.	FASTNER	HILTI / FISHER/ EQUIVALENT
15.	SYNTHETIC ENAMEL PAINTS	BERGER / NEROLAC / ASIAN
21.	ACRYLIC EMULSION PAINTS	BERGER / NEROLAC / ASIAN
22.	AUTO HINGES	HETICH/HAFLE/OZONE/DOORSET

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23.	MAGNETIC CATCHER	GP/POWER/PALO
24	WARDROBE LOCK	GODREJ/LINK/DOORSET
25	S.S HANGER HOOK	HETIC/HAFLE/JAQGUAR
26.	ENAMEL PAINT	ICI DULUX / BERGER / NEROLAC / ASIAN
27	PUTTY	ASIAN/BIRLA WHITE/PERMA /ALLETK
28	ANTI TERMITE	BIFLEX/ LENTRC/PIDLITE
29	CHOWKATH	WELL SEASONED SAL WOOD CHOWKATH
31	CALCIUM SILICATE BOARD FALSE CEILING	HILUX/EQUIVALENT
33	FURNITURE	MARRYFARE/GODREJ/WIPRO/GREEKEN.
34	BLINDS	HUNTER DOUGLAS /MARVEL
35	WATER COOLER SYSTEM	USHA/VOLTAS/EQUIVALENT
36	WATER PURIFIER SYSTEM	KENT/EUREKA FORBES
37	GEYSER	JACQUAR/RACOLD/BAJAJ
38	CARPET	TRANSASIA/BIRLA/EQUIVALENT

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SL.NO	ITEM/ DESCRIPTION	REMARK
1	FURNITURES	
(a)(i)	TABLE	SHADE TO BE APPROVED BY PMC
(ii)	SIDE TABLE	SHADE TO BE APPROVED BY PMC
(iii)	BACK CRENDENZA	SHADE TO BE APPROVED BY PMC
		SHADE TO BE APPROVED BY PMC
(iv)	BACK CRENDENZA	
(b)	CONFERENCE TABLE	SHADE TO BE APPROVED BY PMC
(c)	CHAMBER TABLE	SHADE TO BE APPROVED BY PMC
(d)	RECEPTION TABLE	SHADE TO BE APPROVED BY PMC
SL.NO	ITEM DESCRIPTION	REMARK
15	FILE CABINET	SHADE TO BE APPROVED BY PMC

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16	**SOFA**	SHADE TO BE APPROVED BY PMC
17(i)	**LAMINATE FINISH STORAGE CABINET**	SHADE TO BE APPROVED BY PMC
(ii)	**VENEER FINISH STORAGE CABINET**	SHADE TO BE APPROVED BY PMC
18	**ROLLER BLINDS**	SHADE TO BE APPROVED BY PMC
19	**SOFT BOARD**	SHADE TO BE APPROVED BY PMC
SL.NO	**ITEM DESCRIPTION**	**REMARK**
20	**SERVER ROOM TABLE**	SHADE TO BE APPROVED BY PMC

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21(i)	**CABIN ROOM**	SHADE TO BE APPROVED BY PMC
(ii)	**SIDE TABLE**	SHADE TO BE APPROVED BY PMC
22	**XEROX AND STORE ROOM TABLE**	SHADE TO BE APPROVED BY PMC

NOTE:- 1. Refer B.O.Q to quote the rate.
2.Refer Tendered Drawing and design to execute the work.

				ANNEXURE -II
MAKE LIST FOR CHAIRS				
SL. NO	**ITEM DESCRIPTION**		**MAKE**	
1	CHAIR		Godrej, Featherlite , Geeken.	

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LIST OF APPROVED MATERIALS / FIRE FIGHTING AGENCY

The contractor shall use materials in their works subject to inspection prior to dispatch, by owner or his authorized representative of any materials, as deemed necessary in accordance with the following list, all materials not otherwise specified shall be in accordance with the latest Indian Standard Specification or equivalent , where such exists and prior approval of NLUO / PMC. The contractor shall be bound to offer sample of materials. Which are claimed to be conforming to I.S. specifications, for testing at an approved Test Laboratory.

FIRE FIGHTING EXECUTIVE AGENCY : CEASEFIRE / TYCO / MX SYSTEM INTERNATIONAL (P) LTD
The executing agency should have their office and necessary infrastructure in the state of Odisha, at least for a minimum period of 10 years or above with all necessary statutory registrations. The Technicians (Welders, Fitters & Electrical) being deployed in the project must be trained, skillful, experienced with necessary proof / certifications and must be employed by the company directly on their payrolls with necessary statutory requirements like ESIC, PF and insurance

APPROVED MAKE LIST OF FIRE EXTINGUISHER & ESCAPE SIGNAGES

1.	Fire Extinguisher (Powder type)	CEASEFIRE/ EQUIVALENT
2.	Fire Extinguisher (Water type)	CEASEFIRE/ EQUIVALENT
3.	Fire Extinguisher (CO2 type)	CEASEFIRE/ EQUIVALENT
4.	First Aid box	CEASEFIRE/ EQUIVALENT
5.	Escape Signage's	CEASEFIRE/ EQUIVALENT

APPROVED MAKE LIST OF PUBLIC ADDRESSABLE SYSTEM

1.	CONTROLLER	:	BOSCH / EQUIVALENT
2.	CALL STATION	:	BOSCH / EQUIVALENT
3.	AMPLIFIER	:	BOSCH / EQUIVALENT
4.	SPEAKER	:	BOSCH / EQUIVALENT
5.	DIGITAL MESSAGE PLAYER	:	BOSCH / EQUIVALENT
6.	DVD PLAYER	:	LG / EQUIVALENT

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7. CABLE	:	POLYCAB / UNIVERSAL / VARSHA / EQUIVALENT

APPROVED MAKE LIST OF ADDRESSABLE FIRE ALARM SYSTEM

1. PANEL	:	CEASEFIRE-HOCHIKI / EQUIVALENT
2. MULTI SENSOR DETECTOR	:	CEASEFIRE-HOCHIKI / EQUIVALENT
3. MANUAL CALL POINT	:	CEASEFIRE-HOCHIKI / EQUIVALENT
4. LOOP POWERED WALL SOUNDER	:	CEASEFIRE-HOCHIKI / EQUIVALENT
5. ISOLATOR BASE	:	CEASEFIRE-HOCHIKI / EQUIVALENT
6. CABLE	:	POLYCAB / UNIVERSAL / VARSHA / EQUIVALENT

APPROVED MAKE LST OF EMERGENCY EVACUATION SYSTEM

1. PANEL	:	CEASEFIRE-HOCHIKI / EQUIVALENT
2. TRANSFORMER	:	CEASEFIRE-HOCHIKI / EQUIVALENT
3. KEY PAD	:	CEASEFIRE-HOCHIKI / EQUIVALENT
4. CLOSED AREA LED DOWN LIGHTER	:	CEASEFIRE-HOCHIKI / EQUIVALENT
5. OPEN AREA LED DOWN LIGHTER	:	CEASEFIRE-HOCHIKI / EQUIVALENT
6. EXIT SIGNAGE	:	CEASEFIRE-HOCHIKI / EQUIVALENT
7. MOUNTING BASE	:	CEASEFIRE-HOCHIKI / EQUIVALENT
8. STEP LIGHTING UNIT	:	CEASEFIRE-HOCHIKI / EQUIVALENT
9. FLEXIBLE CABLE	:	POLYCAB / UNIVERSAL / VARSHA / EQUIVALENT
10. CONDUIT	:	VIP / EQUIVALENT

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LIST OF APPROVED MATERIALS/FIRE FIGHTING AGENCY

The contractor shall use materials in their works subject to inspection prior to dispatch, by owner or his authorized representative of any materials, as deemed necessary in accordance with the following list, all materials not otherwise specified shall be in accordance with the latest Indian Standard Specification or equivalent , where such exists and prior approval of NLUO / PMC. The contractor shall be bound to offer sample of materials. Which are claimed to be conforming to I.S. specifications, for testing at an approved Test Laboratory.

FIRE FIGHTING EXECUTING AGENCY : CEASEFIRE / TYCO / MX SYSTEM INTERNATIONAL (P) LTD
The executing agency should have their office and necessary infrastructure in the state of Odisha, at least for a minimum period of 10 years or above with all necessary statutory registrations. The Technicians (Welders, Fitters & Electrical) being deployed in the project must be trained, skillful, experienced with necessary proof / certifications and must be employed by the company directly on their payrolls with necessary statutory requirements like ESIC, PF and insurance

APPROVED MAKE LIST OF FIRE EXTINGUISHER & ESCAPE SIGNAGES

1.	Fire Extinguisher (Powder type)	CEASEFIRE/ EQUIVALENT
2.	Fire Extinguisher (Water type)	CEASEFIRE/ EQUIVALENT
3.	Fire Extinguisher (CO2 type)	CEASEFIRE/ EQUIVALENT
4.	First Aid box	CEASEFIRE/ EQUIVALENT
5.	Escape Signage's	CEASEFIRE/ EQUIVALENT

APPROVED MAKE LIST OF PUBLIC ADDRESSABLE SYSTEM

6. CONTROLLER	:	BOSCH / EQUIVALENT
7. CALL STATION	:	BOSCH / EQUIVALENT
8. AMPLIFIER	:	BOSCH / EQUIVALENT
9. SPEAKER	:	BOSCH / EQUIVALENT
10. DIGITAL MESSAGE PLAYER	:	BOSCH / EQUIVALENT

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11. DVD PLAYER	:	LG / EQUIVALENT
12. CABLE	:	POLYCAB / UNIVERSAL / VARSHA / EQUIVALENT

APPROVED MAKE LIST OF ADDRESSABLE FIRE ALARM SYSTEM

7. PANEL	:	CEASEFIRE-HOCHIKI / EQUIVALENT
8. MULTI SENSOR DETECTOR	:	CEASEFIRE-HOCHIKI / EQUIVALENT
9. MANUAL CALL POINT	:	CEASEFIRE-HOCHIKI / EQUIVALENT
10. LOOP POWERED WALL SOUNDER	:	CEASEFIRE-HOCHIKI / EQUIVALENT
11. ISOLATOR BASE	:	CEASEFIRE-HOCHIKI / EQUIVALENT
12. CABLE	:	POLYCAB / UNIVERSAL / VARSHA / EQUIVALENT

APPROVED MAKE LST OF ADDRESSABLE LED BASED EMERGENCY EVACUATION SYSTEM

11. PANEL		:CEASEFIRE-HOCHIKI / EQUIVALENT
12. TRANSFORMER	:	CEASEFIRE-HOCHIKI / EQUIVALENT
13. KEY PAD	:	CEASEFIRE-HOCHIKI / EQUIVALENT
14. CLOSED AREA LED DOWN LIGHTER	:	CEASEFIRE-HOCHIKI / EQUIVALENT
15. OPEN AREA LED DOWN LIGHTER		:CEASEFIRE-HOCHIKI / EQUIVALENT
16. EXIT SIGNAGE	:	CEASEFIRE-HOCHIKI / EQUIVALENT
17. MOUNTING BASE	:	CEASEFIRE-HOCHIKI / EQUIVALENT
18. STEP LIGHTING UNIT	:	CEASEFIRE-HOCHIKI / EQUIVALENT
19. FLEXIBLE CABLE	:	POLYCAB / UNIVERSAL / VARSHA
20. CONDUIT	:	VIP / EQUIVALENT

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APPROVED MAKE LIST OF FM 200 GAS FIRE SUPPRESSION SYSTEM

1. FM 200 FIRE SUPPRESSION SYSTEM	:	CEASEFIRE / EQUIVALENT
2. FLEXIBLE CABLE	:	POLYCAB / UNIVERSAL / VARSHA / EQUIVALENT
3. CONDUIT	:	VIP / EQUIVALENT

LIST OF APPROVED MATERIALS

The contractor shall use materials in their works subject to inspection prior to dispatch, by owner or his authorized representative of any materials, as deemed necessary in accordance with the following list, all materials not otherwise specified shall be in accordance with the latest Indian Standard Specification or equivalent , where such exists and prior approval of NLUO / PMC. The contractor shall be bound to offer sample of materials. Which are claimed to be conforming to I.S. specifications, for testing at an approved Test Laboratory.

Contractor shall purchase all materials from the makers or their authorized stockists only. Necessary documentary evidences must be produced to the Owner or their authorized representative on demand. Contractor shall be bound to supply items of any make of the items as per the choice of the Owner / PMC.

1. Acceptable Materials List (Internal)

1.1 Conduits - P.V.C.

a)	Make	:	ISI Marked.
b)	Accessories	:	Same make as that of conduit.

1.2 Wiring Cables - PVC Insulated Copper

a)	Make	:	Finolex./ Havell's / Polycab/R.R Kable
b)	Voltage Grade	:	1100 Volts & as per IS 694 / 1990

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1.3 Distribution Boards

a)	Make	:	Schneider (protect) / Legrand / Havell's
b)	Make of MCB's	:	Schneider (Protect) / Legrand / Havell's

1.4 Wiring Accessories

a)	5A / 15A switches sockets, antenna sockets & telephone sockets	:	Schneider (Clipsal - Opale) / Legrand / Havell's / Crabtree (Athena)
b)	Ceiling roses / Angle holders	:	Cona / Anchor
c)	Switch plates / Covers	:	Schneider (Clipsal - Opale) / Legrand / Havell's / Crabtree (Athena)
(d)	Switch box	:	Schneider (Clipsal-Opale) / Legrand / Havell's

1.5 Fitting & Fixtures :

a)	Light fittings	:	Goldwyn / Decolux/Schreder /Philips
b)	Bulb	:	Philips / Bajaj / CG /Orpat
c)	Fan	:	Crompton Greaves / Bajaj / USHA / Havell's
d)	Exhaust fan	:	Crompton Greaves / GE / Almonard / Havell's

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1.6 Telephone Wiring :

a) Telephone Cable : Finolex / Havell's

1.7 Conduit Pipe (PVC) : ISIMark

EQUIPMENT SCHEDULE AND LIST OF ACCEPTABLE MATERIALS MEDIUM VOLTAGE SWITCHES GEAR AND TRANSFORMER

1. List of Acceptable Materials

1.1. The following makes of equipment / materials shall be acceptable under this contract.

(A) Medium Voltage Switch-gear

i)	Air circuit breakers	:	Larsen & Toubro / Schneider
ii)	Switch-fuse units	:	Larsen & Toubro / G.E. / SCHNEIDER / SIEMENS
iii)	HRC fuses	:	G.E. / Larsen & Toubro / SIEMENS / Schneider
iv)	Change over switch	:	Schneider / Larsen & Toubro / G.E. /SCHNEIDER
v)	M.C.C.B.	:	Larsen & Toubro / Schneider / G.E.

(B) Cables

i)	H.T. Cable	:	ICC / CCI / Gloster / Nicco / Universal / INCAB / RPG/ Havells /

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ii) L.T. Cable : ICC / CCI / Gloster / NICCO / Universal / Torrent / Havells / INCAB / RPG

(C) Meters & Indicators

i) Ammeter / Voltmeter / P.F. Meters : AEP / UE / IMP / Automatic Elect.

ii) Kwh Meter : REMCO / GEC / SEMS / HPL / ALTHOM / SECURE

iii) Frequency Meter : AEP / NIPPON / UE

iv) Indicating Lamps : Siemens / Larsen & Toubro / Binay / Concord.

(D) Instrument Transformers

i) H.T. Current Transformers : VE / EMS / KAPPA / AUTOMATIC ELECTRIC.

ii) H.T. Potential Transformers : Jyothi / VE / ESM.

iii) D.T. Current Transformers : ANP / KAPPA / ESM.

iv) Selector Switches : Larsen & Toubro / Kaycee / Thakoor.

(E) Relays

i) Over current and earth fault relay : AREVA / Siemens / Larsen & Toubro.

ii) Power factor correction relay : NIPPO / MSIL / AVMACO / Siemens.

iii) AX relay : AREVA / ABB

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(F) Miscellaneous

i)	Cable gland	:	APT / ELECTROMAG
ii)	Lugs	:	Dowels.
iii)	Connectors	:	Indian Engineering Company / ELMEC / Schneider
iv)	Capacitors	:	Khatau Junker / Voltas / BSES / MSIL / Powercap / Crompton Greaves.
v)	Contactors	:	Larsen & Toubro / Siemens / BCH / Schneider
vi)	Starters	:	Larsen & Toubro / Siemens / BCH

N.B.: 1. All material to be used should be of standard / make / specification as specified in the Tender and only after approval of the Concerned Consultant/ NLUO.

2. The various items to be used in the interior and furnishing work shall be of ISI Standards. Wherever the item/product will not come under ISI mark/standard, shall be got tested/approved for its quality etc ,however the necessary testing charges shall be borne by the contractor.

MATERIAL LIST OF APPROVED MAKE OF WI-FI SYSTEM AND LAN NETWORKING

1.	CABLE	:	SYSTIMAX /PANDUIT/SEIMON
2.	OFC	:	SYSTIMAX /PANDUIT/SEIMON
3.	WIRELESS ACCESS POINT	:	CISCO/ALLIED TELSIS/MOTOROLA
4.	WIRELESS CONTROLLER	:	CISCO/MOTOROLA/ALLIED TELESIS
5.	INDOOR ACCESS POINT	:	CISCO/MOTOROLA/ALLIED TELESIS
6.	POE	:	CISCO/D-LINK/ALLIED TELESIS/HP

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7. RACK	:	VAL RACK/HCL/APW PRESIDENT
8. PATCH PANEL	:	SYSTIMAX /PANDUIT/SEIMON
9. MODULAR JACK	:	SYSTIMAX /PANDUIT/SEIMON
10. PATCH CORD	:	SYSTIMAX /PANDUIT/SEIMON
11. 6U/9U Rack	:	APW / NETRACK/PRESIDENT
12. WIFI & SWITCHING	:	CISCO / DLINK / ALLIED TELESIS/ HP
13. DISTRIBUTION SWITCH	:	CISCO / DLINK / ALLIED TELESIS/ HP
14. IP PBX WITH 50 EXTENSIONS	:	CISCO/PANASONIC/GRANDSTREAM
15. IPPHONE	:	CISCO/PANASONIC/GRANDSTREAM

MATERIAL LIST OF APPROVED MAKE OF VRV/VRF AC SYSTEM

1	VRF/VRV UNITS	LG/MITSUBISHI/DAIKIN/TOSHIBA
2	COPPER PIPE	RAJCO/MANDEV/TOTALINE
3	INSULATION (NITRILE RUBBER)	SUPERLON /ARMAFLEX/A FLEX
4	CONTROL CABLE	FINOLEX/ASIAN/EQUIVALENT
5	COOLING COILS	OWN MAKE
6	DRAIN PIPING	SUPREME/HARI PLAST/ORIPLAST/FINOLEX
7	GI SHEET	TATA/SAIL/JINDAL/VSP

MATERIAL LIST OF APPROVED MAKE OF AUDIO VISUAL SYSTEM

1. Flush Mountable Microphone Delegate Unit 50 cm	Sennheiser/Televic/Apart
2. Flush Mountable Microphone Chairman unit 50 cm	Sennheiser/Televic/Apart
3. The Central Unit (Controller)	Sennheiser/Televic/Apart

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4. Flush Mount for Chairman & Delegate Unit	Sennheiser/Televic/Apart/Customized
5. Wireless Handheld microphone with 12 frequencies.	Sennheiser/Beyerdynamic/Shure
6. Wireless Lapel microphone with 12 frequencies.	Sennheiser/Beyerdynamic/Shure
7. Audio DSP	Sennheiser/Clearone/Biamp
8. Wall Mount Speaker	Apart/JBL/Tannoy
9. Dual Channel Power Amplifier	Apart/Crown/Labgruppen
10. 4000 lumens WUXGA Projector	Sony,Barco,Christie
11. Ceiling mount for above projector	Customized/Equivalent
12. 65-inch Touch Display	Infocus, LG, Samsung
13. Wall Mount for above Display	Custom
15. Full HD video conference unit	Sony,Polycom, Lifesize
16. Camera for VC with mounts	Sony,Polycom,LifeSize
17. Motorized Screen	Custom
18. Cable Cubby	Extron/Kramer/JBE
19. 4x4 HDMI Matrix Switcher	Extron/Kramer/Crestron
20. HDMI Audio De embedder	Extron/Kramer/Crestron
21. VGA, Audio to HDMI Scaler	Extron/Kramer/Crestron
22. Control Processor	Crestron/AMX/Extron
23. IR Probes	Crestron/AMX/Extron
24. Wireless access point	Motorola/Cisco/ Allied Telesis
25. Lighting Controller	Lutron/Crestron
26. AV Equipment Rack	MTS/Valrack/President
27. Cables& Connectors	Extron/Kramer/MX/Flacon
28. 10 KVA Online UPS	APC / UNILINE/ Paradyne/Emerson

Note: All approved makes shall be ISI Marked

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