NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

TWO BID SYSTEM TENDER FOR

FOR
Interior Works, Electrical, HVAC & Audio Visual Works at the

Conference Room of ICMR, New Delhi.

OWNER

INDIAN COUNCIL OF MEDICAL RESEARCH

V. RAMALINGASWAMI BHAWAN,

ANSARI NAGAR, NEW DELHI-110029

VOLUME-I
(TECHNICAL BID

(PRE QUALIFICATION DOCUMENT)

PROJECT OFFICE **N.P.C.C. Limited** **CRPF UNIT, PLOT NO. 8** **VASANT KUNJ,** **NEW DELHI-110070**	**ZONAL OFFICE** **DELHI ZONAL OFFICE** **148, Sector-44** **Gurgaon,** **Harvana.**

Issued to: -
……

……
……

……..

NATIONAL POJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

Ref. No:-338101/949 Dated:- **17th** October, 2012

CORRIGENDIUM-1

Sealed item rate tenders in CPWD form no.-8 in two bids system are invited by Project Manger, NPCC Ltd. from eligible firm having capacity for Design Engineering and Execution and enlisted in State PWD/MES/PSU/Central Govt./Corporate Bodies/International Organization appropriate category for the of following work.

Sl. No.	Name of Work	Estimated Cost (Lacs)	Earnest money	Period of Completion
1.	Design cum Execution of interior Works, comprising of Electrical, HVAC, Audio Visual & Furniture Works at the Conference Room of ICMR, New Delhi	163 Lacs	2% of Estimated cost	120 Days

The tender documents consisting of pre-qualification documents/eligibility criteria (Volume-I) general terms and conditions, detailed technical specifications, schedule of quantities, (Volume-II) etc can be obtained **Either** from Office of the Project Manager, NPCC Ltd. CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070 on any working day from 09/10/12 to 30/10/2012 on payment of non refundable Rs.1000.00 per set **OR** the tender documents (Volume-I & II) could be downloaded from NPCC Website www.npcc.gov.in for which tender cost of Rs. 1000/- per set is required to be paid. Filled up tender documents along with all details and earnest money and tender cost (if downloaded from the Website) in the form of Demand Draft or Deposit-Call receipt or Banker's cheque in favour of NPCC Ltd shall be submitted in the above mentioned office on or before 31/10/12 by 3.30PM. Envelope-I(Qualification Bid for stage-I) of tender shall be opened the same day at 4.00 PM in presence of authorized representative of tenderer who choose to be present. **2ND** stage pre-qualification will be initiated among successful stage-I pre qualified bidders. Thereafter Envelope-II (Price Bid) shall be opened subsequently for those bidders who have been qualified for the work in pre qualification bids in stage-I and II. For details visit NPCC WEBSITE www.npcc.gov.in NPCC reserves right to cancel any or all the tenders without assigning any reason.

Project Manager

CC :-

1. The Director General, ICMR, Ansari Nagar, New Delhi for kind information.
2. The Zonal Manager, Delhi Zonal Office, NPCC Ltd., Delhi for information please
3. General Manager (PMC) Corporate Office Faridabad for publication in NPCC Web Site and uploading pre-qualification documents (Volume-I) and general terms and conditions, specifications, price bid etc. (Volume-II) in NPCC Ltd. Website.
4. Account Section, NPCC Ltd., CRPF Unit, Vasant Kunj, New Delhi for information.
5. The Editor Hindustan Times for publication in Classified Column from Delhi.
6. The Editor Navbharat Times, for publication in Classified Column from Delhi.

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

PRESS TENDER NOTICE

Ref. No:-338101/944 Dated:- 08th October, 2012

Two Bid system Pre-qualification cum tender Sealed bids are invited by the Dy. General Manager (Civil) of NPCC Limited having its office CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070 from reputed firm having capacity for Design & Engineering & Execution of Interior, Electrical, HVAC, Audio Visual & Furniture Works, at the Conference Room of ICMR, New Delhi having estimated cost Rs. 163 lacs. Detailed Tender notice can be seen NPCC Website. www.npcc.gov.in and tender document could be obtained and submitted from aforesaid office latest by upto 30/10/2012 by 3.30 p.m.

NATIONAL POJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

Ref. No:-338101/944 Dated:- **8th** October, 2012

TENDER NOTICE

Sealed item rate tenders in CPWD form no.-8 in two bids system are invited by Project Manger, NPCC Ltd. from eligible firm having capacity for Design Engineering and Execution and enlisted in State PWD/MES/PSU/Central Govt./Corporate Bodies/International Organization appropriate category for the of following work.

Sl. No.	Name of Work	Estimated Cost (Lacs)	Earnest money	Period of Completion
1.	Design cum Execution of interior Works, comprising of Electrical, HVAC, Audio Visual & Furniture Works at the Conference Room of ICMR, New Delhi	163 Lacs	2% of Estimated cost	120 Days

The tender documents consisting of eligibility criteria, detailed specifications, schedule of quantities, terms and conditions etc can be obtained from Office of the Project Manager, NPCC Ltd. CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070 on any working day from 09/10/12 to 28/10/2012 on payment of non refundable Rs.1000.00 per set. Filled up tender documents along with all details and earnest money in the form of Demand Draft or Deposit-Call receipt or Banker's cheque in favour of NPCC Ltd shall be submitted in the above mentioned office on or before 30/10/12 by 3.30PM. Envelope-I(Qualification Bid for stage-I) of tender shall be opened the same day at 4.00 PM in presence of authorized representative of tenderer who choose to be present. 2ND stage pre-qualification will be initiated among successful stage-I pre qualified bidders. Thereafter Envelope-II (Price Bid) shall be opened subsequently for those bidders who have been qualified for the work in pre qualification bids in stage-I and II. For details visit NPCC WEBSITE www.npcc.gov.in NPCC reserves right to cancel any or all the tenders without assigning any reason.

Project Manager

CC :-

7. The Director General, ICMR, Ansari Nagar, New Delhi for kind information.
8. The Zonal Manager, Delhi Zonal Office, NPCC Ltd., Delhi for information please
9. General Manager (PMC) Corporate Office Faridabad for publication in NPCC Web Site.
10. Account Section, NPCC Ltd., CRPF Unit, Vasant Kunj, New Delhi for information.
11. The Editor Hindustan Times for publication in Classified Column from Delhi.
12. The Editor Navbharat Times, for publication in Classified Column from Delhi.

MINIMUM PREQUALIFICATION CRITERIA FOR THE TENDER AND DOCUMENTS TO BE SUBMITTED BY TENDERER **FOR FIRST STAGE PRE-QUALIFICATIONS**

Agency must fulfill the following requirement for participation in the tender:-

a) Tenderer must be firm having capacity for Design Engineering and Execution of Interior Works comprising of Interior, Electrical, HVAC, Audio-Visual and Furniture Works and have been completed at least three similar single works of a minimum value of each 40% or two similar works for a minimum value of each 50% or one similar works of 80% of the tendered value of work in the last 7 financial years under Govt./Semi Govt./any Public Sector Undertakings/Corporate bodies/International organizations etc.
b) Total Turnover during the last three financial years excluding current financial year should be a minimum of 150% of advertised tender value.
c) Audited Balance sheet for the last three years. (i.e. 2009-2010, 2010-2011,2011-2012)
d) Valid Sales Tax registration number/TIN number.
e) List of works completed in the last 7 financial years indicating brief description of work, project authority, approx. value of contract, date of award & date of completion.
f) Incase of partnership did, power of attorney duly attested by notary Public authorizing in favour of the person who sign the tender.

NOTE:-

1 **Incase of item a & b above,** supportive documents / certificates from the organizations with whom the worked / are working to be enclosed after attested by a Gazette Officer/Notary Public.

2 **Certificate from private** individuals for whom such works are executed / being executed will not be accepted.

3 **Similar work means here** completion Design cum Execution of interior Works, comprising of Electrical, HVAC & Audio Visual Works/conferencing facilities at Institutional Buildings/ Research Centre/ Institute Office Buildings Conference Rooms & Lobbies etc. of minimum three star Hotels

MODE OF SUBMISSION

The tender is to be submitted in two separate sealed covers marked as under.

ENVELOPE- 1

This ENVELOPE shall contain the following:

1) Acceptance letter in the letter head for un-conditional acceptance of the tender conditions as per Performa given in NIT.
2) Earnest Money.
3) Credential Certificate in support of prequalification criteria as per Serial 1(a & b).
4) Sales Tax/Tin number
5) Audited Balance sheet for the last three years.
6) Partnership Deed/ Memorandum of understanding of the organization if applicable.
7) Volume-I Pre qualification bid duly signed.

This envelope shall be marked as

Envelope: 1 - Design cum Execution of interior Works, comprising of Electrical, HVAC & Audio Visual Works at the Conference Room of ICMR, New Delhi. (Pre qualification bid for stage-I)

NIT NO:

DUE ON:

FROM: (Name of the Company)

ENVELOPE- 2

This ENVELOPE shall contain the following

Tender Document i.e. volume-2 (Price bid) duly filled in signed and stamped on each page by tenderer Cutting or over-writing, if any, shall be signed and stamped by the person signing the tender. All pro-forma forming part of tender documents shall be filled in, signed and stamped by the tenderer. All rates shall be quoted in figures and words.

This envelope shall be marked as ENVELOPE – 2.

Both the envelopes/packets shall be individually sealed and kept in an outer envelope marked as: **Design cum Execution of interior Works, comprising of Electrical, HVAC & Audio Visual Works at the Conference Room of ICMR, New Delhi**

NIT No:-

Due On:

From (Name and address of tenderer)

The outer envelope containing ENVELOP-1 & ENVELOP-2 shall be duly sealed and shall be delivered at place of submission of tender on or before the date and given in the tender. The tenders received after due date and time shall not be considered and shall be returned to the tenderer unopened. NPCC shall not be responsible for any postal or other delays and shall take care to ensure the submission of tender at place of receipt of tender on or before due date and time fixed for tender receipt. All the envelopes shall be addressed to the Project Manager, CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070.

First the envelope – 1 of the tenderer shall be opened. Tenderer who unconditionally accept the tender condition and enclose all the pre-qualification documents as per requirement including Earnest money shall be considered for second stage of pre-qualifications. The opening of their price bid i.e. Enveloped – 2 of such tenderer be opened only after evaluation of pre-qualification **criteria of both the stage i.e. stage-I and Sage-II.** The date and time of opening of the price bid of the qualified agencies will be informed in due course. The tenders not accompanied by unconditional acceptance of tender condition shall be rejected and tenders shall not be allowed to attend price bid opening (Envolope-2).

Once the tenderer has given an unconditional acceptance to the tender 'conditions in its entirety, he is not permitted to put any remark (s)/conditions(s) (except unconditional rebate on price, if any) in/along with the tender documents. In case of conditions mentioned above is found violated at any time after opening of tender, the tender shall be summarily rejected and NPCC shall, without prejudice to any other right remedy, be at liberty to forfeit the Earnest Money.

Lowest bidder will be worked out by adding cost of Civil works & other related works as mentioned in the Volume-2 and principal of lowest will be apply.

ACCEPTANCE LETTER

TO BE ENCLOSE IN ENVELOPE-1

Sir

ACCEPTENCE OF TENDER CONDITION

1. The tender document of the work :

   _____

   have been sold to me/us by National Projects Construction Corporation Ltd. And I/We hereby unconditionally accept the tender condition and the tender documents and its entirety for the above work.

2. The contents of VOL-1 of the tender documents / Pre qualification bid (Notice inviting Tenders and instruction of Tenders) have been noted wherein it is clarified that after unconditionally accepting the tender condition in its entirety , it is not permissible to put any remark(s)/condition(s) (except unconditional rebate on price if any) in the tender enclose and same has been followed in the present case . In case this provision of the tender shall be summarily rejected and NPCC shall, without prejudice to any other right or remedy be at liberty to forfeit the full said earnest money absolutely.

3. The required earnest money for this work enclose herewith.

4. If I/we will not fulfill the minimum qualification criteria of the tender I/we will not-lodge any claim for allotment of work.

Yours faithfully

(Signature of tender with rubber stump)

Dated _____

ENERAL INFORMATION & INSTRUCTIONS FOR APPLICANTS

1.0 General :

1.1 Letter of transmittal and forms for pre-qualifications are given in Section III.

1.2 All information called for in the enclosed forms should be against the relevant columns in the forms. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a 'nil" or "no such case" entry should be made in that column. If any particulars/query is not applicable in case of the applicant, it should be stated as "not applicable". The applicants are cautioned that not giving complete information called for in the application forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing the information may result in the applicant being summarily disqualified. Applications made by telegram or telex and those received late will not be entertained**.**

1.3 The application should be type-written. The applicant should sign each page of the application.

1.4 **Overwriting** should be **avoided.** Correction, if any, should be made by **neatly crossing out,** initialing, dating and rewriting. Pages of the pre-qualification document are numbered. Additional sheets, if any added by the contractor, should also be numbered by him. They should be submitted as a package with signed letter of transmittal.

1.5 References, information and certificates from the respective clients certifying suitability, technical know how or capability of the applicant should be signed by a Competent Official of the Organization.

1.6 The applicant may furnish any additional information which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. He is, however, advised not to furnish superfluous information. No information shall be entertained after submission of pre-qualification document unless it is called for by the Employer.

1.7 Any information furnished by the applicant found to be incorrect either immediately or at a later date, would render him liable to be **debarred from tendering /taking** up of the work in NPCC/ICMR.

1.8 The pre-qualification document in prescribed form, duly completed and signed along with EMD, should be submitted **in a sealed cover**. The sealed cover superscripted "**Pre-qualification document for Design cum Execution of Interior Works, comprising of Electrical, HVAC & Audio Visual Works at the Conference Room of ICMR, New Delhi**

1.9 Documents submitted in connection with pre-qualification will be treated confidential and will not be returned.

1.10 Prospective applicants may request clarification of the project requirements and pre-qualification document. Any clarification given by the Employer will be forwarded to those who have purchased the pre-qualification document. No request for clarification will be considered after

2.0 Definitions:

2.1 In this document the following words and expressions have the meaning hereby assigned to them.

2.2 **Owner/Employer**: Means the ICMR, acting through the Director General ICMR, New Ansari Nagar, New Delhi.

2.3 **Applicant**: Means the individual, proprietary firm, firm in partnership, limited company private or public or corporation.

2.4 **"Year"** means "Financial Year" unless stated otherwise.

3.0 Method of Application:

3.1 If the applicant is an individual, the application shall be signed by him above his full type- written name and current address.

3.2 If the applicant is a proprietary firm, the application shall be signed by the proprietor above his full typewritten name and the full name of his firm with its current address.

3.3 If the applicant is a firm in partnership, the application shall be signed by all the partners of the firm above their full typewritten names and current addresses or alternatively by a partner holding power of attorney for the firm. In the latter case a **certified copy** of the **power of attorney** should accompany the application. In both cases, a certified copy of the partnership deed and current addresses of all the partners of the firm should accompany the application.

3.4 If the applicant is a limited company or a corporation, the application shall be signed by a duly authorized person holding power of attorney for signing the application. The applicant should also furnish a copy of the Memorandum of Articles of Association duly attested by a Public Notary.

4.0 Final Decision Making Authority.

Zonal Manager, NPCC Ltd., Delhi Zonal Office, Gurgaon reserves the right to accept or reject any application and to annul the pre-qualification process and reject all applications at any time, without assigning any reason or incurring any liability to the applicants.

5.0 Particulars Provisional

The particulars of the work given in Section I are provisional. They are liable to change and must be considered only as advance information to assist the applicant.

6.0 Site Visit

The applicant is advised to visit the site of work at his own cost, and examine it and its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment. Contract person at site is Mr. S.K. Majumder, DGM© 9868828090 and Shri B.S. Malik, Sr. Manager (M) 09467700940 or Shri A.K. Srivastava, Executive Engineer, ICMR, 9818941494.

7 Working drawings

Lowest bidder has to submit at least 2 to 3 alternative drawings of each major component matching with specification of items as stipulated in the BOQ for approval of ICMR/NPCC within a month for which additional **@ 1% of total execution net value** will be paid as extra in addition to quoted rates. It will be the responsibility of the lowest bidder to get approval from ICMR.

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

EVALUATION CRITERIA FOR PRE-QUALIFICATION

1. For the purpose of pre-qualification, applicants will be evaluated in the following manner:

2 The initial criteria prescribed above in respect of experience of similar works completed, financial turn over, bidding capacity, and certifications etc. will first be scrutinized and the applicant's eligibility for pre-qualification for the work be determined for first stage.

3- (a) After the scrutiny made as mentioned above, drawing and design facilities at NCR, executed works of those applicants, manpower etc. who are found eligible for prequalification, will be visited by an Evaluation Committee comprising of official of NPCC from CRPF Unit, Zonal Office and ICMR. Evaluation for drawing / design facility will be done after visit of the Evaluation Committee to the applicant's consultant firm, on the basis of information provided by the applicant firm details & List of manpower to be provided in form E-1& E-2 enclosed with the PQ document),

(b) Similarly, for evaluation of quality of work, the evaluation committee shall visit at least two similar works done by them in the past e.g. **works pertaining to Design cum Execution of Interior Works, comprising of Electrical, HVAC & Audio Visual Works at NCR.**

(c) In final stage applicant will be asked for 3D presentation in front of evaluation committee for conference hall furniture, Interior Work, Electrical Works, HVAC & Audio Visual Works based on BOQ and conceptual drawings and marks will be accessed as per enclosed form H.

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

i. The applicant shall then by evaluated for the following criteria which also includes **a presentation** before the Evaluation Committee.

a)	Permanent Office at NCR including Drawing and Design facilities, Skilled Manpower, completed works of similar nature (FORM-B) & marks will be given as per (Form "F-1" & "F-2") as per assessment	Maximum 30 Marks
b)	Quality of works executed by the applicant in the past (client certificate form – D or similar certificate) and assessment by evaluation committee (Form –G)	Maximum 40 Marks
c)	3D-Presentation by the applicant based on basis conceptual drawing and requirement of the ICMR as per BOQ stipulated in Volume-2. Assessment by Evaluation Committee Members (Form –H)	Maximum 30 Marks
	Total :	**100 Marks**

To pre-qualify, the applicant must secure at least **75%** marks in criteria 'b' and 'c ' and at least **50%** marks in criteria 'a' above and minimum **70%** marks in aggregate.

The NPCC, however, reserves the right to restrict the list of pre-qualified contractors to any number deemed suitable by it.

(b) Even though an applicant may satisfy the above requirements, he would be liable to disqualification if he has:

(a) Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the pre-qualification document.
(b) Record of poor performance such as abandoning work, not properly completing the contract, or financial failures/weakness etc.

2. FINANCIAL INFORMATION

Applicant should furnish the following financial information:

Annual financial statement audited for the last three years **(in Form "A")**

3. EXPERIENCE IN WORKS HIGHLIGHTING EXPERIENCE IN SIMILAR WORKS

10.1 Applicant should furnish the following documents:

(a) List of all works of similar nature successfully completed during the last five years **(in Form "B").**

10.2 Particulars of completed works and performance of the applicant duly authenticated/certified by an officer not below the rank of Executive Engineer or equivalent should be furnished separately for each work completed or in progress **(in Form "D").**

4. ORGANISATION INFORMATION

Applicant is required to submit the following information in respect of his organization **(in Forms "E" & "E-1").**

(a) Name & Postal Address, i/c Telephone, Fax Number, e-mail etc.

(b) Copies of original documents defining the legal status, place of Registration and principal places of business:

(c) Names of Title of Directors and Officers to be concerned with the work, with designation of individuals authorized to act for the organization.

(d) Information on any litigation in which the applicant was involved during the last five years, including any current litigation.

(e) Authorization for employer to seek detailed references.

(f) Number of Technical & Administrative Employees in parent company, subsidiary company and how these would be involved in this work **(in Form – "E-1").**

5. TENDER SUBMISSION

After evaluation of pre-qualification applications, a list of qualified agencies will be prepared. Thereafter, pre-qualified agencies only would be invited to rejoin opening of price bid by a committee comprising of official of NPCC and ICMR.

FORM 'A'

FINANCIAL INFORMATION

I. Financial Analysis – Details to be furnished duly supported by figures in balance sheet/profit & loss account for the last three years duly certified by the Chartered Accountant, as submitted by the applicant to the income Tax Department (Copies to be attached)

		2009-10	2010-11	2011-12

(i) Gross Annual turn over
(ii) Profit/Loss

II. Financial arrangements for carrying out the proposed work.

III. The following certificates are enclosed:

(a) PAN and TIN Nos.

Signature of Applicant (s)

Signature of Chartered Accountant with Seal

FORM 'B'

DETAILS OF ALL WORKS OF SIMILAR NATURE / CLASS COMPLETED DURING THE LAST FIVE YEARS ENDING LAST DAY OF THE MONTH March, 2012.

Sl. No.	Name of Work / project and location	Owner or sponsoring organization	Cost of work in Lacs	Date of commencement as per contract	Stipulated date of completion	Actual date of comp-letion	Litigation/ arbitration pending /in progress with details *	Name and address/ phone number of officer (of the owner) to whom reference may be made	Remark
1.	2.	3	4	5	6	7	8	9	10

*Indicate gross amount claimed and amount awarded by the Arbitrator

NOTE

1. PLEASE MENTION ALL WORKS EXECUTED EQUAL TO OR ABOVE THE QUALIFYING AMOUNT.

NOTE 5
PLEASE CLEARLY INDICATE THE WORKS (IN THE ABOVE FORM) ON THE BASIS OF WHICH PREQUALIFICATION IS BEING SOUGHT.

Signature of Applicant (s)

FORM 'D' or Similar Certificate

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORM "B".

This form must be submitted for the works on the basis of which the applicant is seeking pre-qualification.

1. Name of work/Project & Location
2. Agreement No.
3. Estimated Cost
4. Tendered Cost
5. Date of start
6. Date of completion
   (i) Stipulated date of completion
   (ii) Actual date of completion
7. a) If stipulated date and actual dates are different, list the reasons for delay.

   b) Reasons for Delay (To be specified by the person signing this form)

   (i) Period of delay attributable to Contractor
   (ii) Period of delay attributable to Employer

8. Amount of compensation levied for delayed completion, if any.
9. **Performance report**

a)	Quality of work	Very good/Good/Fair/Poor
b)	Financial soundness	Very good/Good/Fair/Poor
c)	Technical Proficiency	Very good/Good/Fair/Poor
d)	Resourcefulness	Very good/Good/Fair/Poor
e)	General behavior	Very good/Good/Fair/Poor

_ (To be signed by Executive Engineer or equivalent such as Project Manager of the Employer)

Employer's representative is requested to specify the reasons for delay in case stipulated and actual date of completion are different.

NOTE 1: The works for which this form is submitted should be reflected in part 'B' also. If form 'D' is submitted for works, which are not covered in FORM 'B', then it will not be considered for evaluation.

2 Total marks will be awarded **10 for Excellent/very good** and **8 mark for good** certifications of client and than average will be work out and maximum mark will be limited to only 10. No mark will be considered for fair or poor marking.

3 Remaining 30 mark will be rest on evaluation committee for applicant past works **based on Form-G**

FORM " E"

STRUCTURE & ORGANISATION

1. Name & Address of the applicant
2. Telephone No./Telex No./Fax No.
3. Legal status of the applicant (attach copies of original document)
   Defining the legal status)
   (a) An Individual
   (b) A proprietary firm
   (c) A firm in partnership
   (d) A limited company or Corporation
4. Since when the applicant has been in business. Provide documentary proof.
5. Particulars of registration with various Government bodies (attach attested photocopy).

Organization/Place of registration	Registration No.
(a)	
(b)	
(c)	
(d)	

6. Names and Titles of Directors & Officers with designation to be concerned with this work
7. Designation of individuals authorized to act for the organization
8. Was the applicant ever required to suspend the works
   for a period of more than six months continuously after award of work. If so, give the name of the project and reasons of suspension of work.
9. Has the applicant, or any constituent partner in case of partnership firm, ever abandoned the awarded work before its completion If so, give name of the project and reasons for abandonment.

10. Has the applicant, or any constituent partner in case of partnership firm, ever been debarred/black listed for tendering in any organization at any time ? If so, give details
11. Has the applicant or any constituent partner in case of partnership firm, ever been convicted by a court of law? If so, give details.
12. Does the applicant have necessary software for preparation of Architectural Plans. 3D views etc. if so, mention the names of the software's available.
13. Any other information considered necessary but not Included above.

Signature of Applicant (s)

FORM 'E-1'

DETAILS OF TECHNICAL & ADMINISTRATIVE PERSONNEL AVAILABLE WITH THE APPLICANT AND TO BE EMPLOYED FOR THE WORK

S. No.	Desig.	Total Number	Number available for this work	Name	Quali-fications	Professional experience and details of work carried out	How these would be involved in this work	Remarks
1	2	3	4	5	6	7	8	9

Signature of Applicant(s)

1. This should cover the total strength of employees (both technical & Administrative) available with the applicant for co-coordinating the contract job, preparation and study of drawings and supervision of work at site. e.g. Architects and Draftsmen for preparation of drawings and 3D-views, Interior Designers, Engineers / Diploma holders with experience in supervision of interior & furniture works.

2. Staff and workers strength of the manufacturing/fabrication facility of the applicant is not to be included here.

(To be filled by Evaluation Committee Member)

DATA SHEET FOR EVALUATION CRITERIA FOR PRE-QUALIFICATION OF BIDDERS

FORM 'F – 1'

Details about Manufacturing/Fabrication facility

1. **Name of the Company:**
2. **Full Address:-**

	Description of items		Total marks given by committee member
1.	Whether applicant's company/firm has its own consultancy office, Design and Drawing facilities etc.	If Yes there will be 20 marks for functional facilities as per following. 1. Excellent -20 Marks. 2. Very good- 14 marks 3. Good- 06 marks 4. Poor – no marks	
2	Whether the applicant has completed similar works comprising of Interior Works, Electrical, HVAC & Audio Visual Works and Conferencing etc. at NCR in last 7 years. (Based on client certificate)	If yes for every good works based on certificate of clients marks will be @ 2 marks for each completed works and maximum marks will be 6 for 3 inspected sites.	

Maximum marks embarked for Form F-1 = 26 marks
Total marks obtained by Agency =

Signature of member of evaluation committee member.

Committee No. 1 Committee No. 2 Committee No. 3

Name with Designation

(To be filled by Evaluation Committee Member)

FORM 'F-2'

STRENGTH OF TECHNICAL STAFF & WORKERS AVAILABLE IN THE MANUFACTURING / FABRICATION FACILITY OF THE APPLICANT.

1. **Name of the Company:**

2. **Full Address:-**

Sl.no.	Total strength of employees	Total marks given by committee member
1	For total strength of employees in consultancy firm more **than 20 there will be 4 marks.**	
2	For total strength of employees in consultancy firm if **less than 10 there will be 2 marks.**	

Maximum marks embarked for Form F-2= 4marks
Total marks obtained by Agency =

Signature of the evaluation committee member.

Signature of member of evaluation committee member.

Committee No. 1 Committee No. 2 Committee No. 3

Name with Designation

(To be filled by Evaluation Committee Member)

FORM-H

1. **Name of the Company:**

2. **Full Address:-**

Sl.No	Description of the items.	Provision for marking	Total marks given by committee member
a)	Does the applicant have the in house facility (software) for producing 3D views for Interior Works of Conference Hall, Electrical & HVAC Works, Audio Visual Works etc.	For available facilities applicant will get 5 marks.	
b)	3D presentation by applicant at a place specified by the evaluation committee for acoustic work of Conference Hall, Interior Works, Electrical Works, HVAC Works, Audio Visual Works etc. based on conceptual drawings and BOQ of Vol-II .	Total marks for 3D presentation will be given as under. 1. Excellent -25 Marks. 2. Very Good- 15 marks. 3. Good- 10 marks. 4. Poor – no marks.	

1. Maximum marks against form –H have been kept 30 marks as illustrated for in House Software facility and 3-D presentation based on the information given in tender documents particularly in Vol-II.
2. The agency who has successfully screened for Interior Works, Electrical, HVAC & Audio Visual Works are require to be making presentation as the case may be.

Maximum marks embarked for Form H = 30 marks

Total marks obtained by Agency =

Signature of the evaluation committee member.

(To be filled by Evaluation Committee Member)

DATA SHEET FOR EVALUATION CRITERIA FOR PRE-QUALIFICATION OF BIDDERS

FORM 'G'

Details about executed works similar to Interior Works, Electrical Works, HVAC & Audio Visual Works etc. at NCR

1 **Name of the Company where applicant executed works**
2. **Full Address:-**
3 **Date of visit:**
4. **Duration of completion:**

	Description of items		Total marks given by committee member
1.	Whether applicant's has completed interior works.	If Yes there will be 10 marks for i.e. interior works as per following. 1. Excellent -10 Marks. 2. Very good- 08 marks 3. Good- 06 marks 4. Poor – no marks	
2	Whether the applicant has completed similar works comprising of HVAC & and Electrical Works at NCR.	If Yes there will be 10 marks for i.e. interior works as per following. 1Excellent -10 Marks. 2 Very good- 08 marks 3Good- 06 marks 4. Poor – no marks	
3	Whether the applicant has Audio Visual Works for conferencing system	If Yes there will be 10 marks for i.e. interior works as per following. 1. Excellent -10 Marks. 2. Very good- 08 marks 3. Good- 06 marks 4. Poor – no marks	
4	Whether the applicant has completed furniture works	If Yes there will be 10 marks for i.e. interior works as per following. 1Excellent -10 Marks. 2Very good- 08 marks 3Good- 06 marks 4. Poor – no marks	

Maximum marks embarked for Form G = 40marks
Total marks obtained by Agency =

Signature of member of evaluation committee member.

Committee No. 1 Committee No. 2 Committee No. 3

Name with Designation

Note: It will be applicant responsibility to facilitate the visit of Committee Member at his executed works at site.

T E N D E R D O C U M E N T S

Interior Works, Electrical, HVAC & Audio Visual Works at the Conference Room of ICMR, New Delhi.

FOR

OWNER

INDIAN COUNCIL OF MEDICAL RESEARCH

V. RAMALINGASWAMI BHAWAN,

ANSARI NAGAR, NEW DELHI-110029

VOL-II
(PRICE BID)
GENERAL TERMS AND CONDITIONS, TECHNICAL SPECIFICATIONS & BOQ

NATIONAL PROJECTS CONSTRUCTION CORPN. LTD.

PROJECT OFFICE
N.P.C.C. Limited
CRPF UNIT, PLOT NO. 8
VASANT KUNJ,
NEW DELHI-110070

ZONAL OFFICE
DELHI ZONAL OFFICE
148, Sector-44
Gurgaon,
Haryana.

Issued to :- ……
……
……
……

NATIONAL POJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

General Terms and Condition

1.o. General

The contract means the document forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of NPCC and the contractor, together with the documents referred to therein including these condition, the specification, drawings and instruction issued from time to time by the Engineer-in-Charge and all these taken together, shall be deemed t o form one contract and shall be complementary to one another.

1.1. In the contract the following expression shall, unless the context otherwise requires, have the meanings, hereby respecti assigned to them.
1.2. National Project Construction Corporation Limited, hereinafter called "NPCC" propose to get the works executed as mentioned in the contract on behalf of Owner/ Client.
1.3. The work will be executed as per drawings approved and released for "CONSTRUCTION "by NPCC unless otherwise specified elsewhere in the tender document.

2. OTHER DEFINITIONS

a. ENGINEER-IN-CHARGE means the Executive Engineer of NPCC who shall supervise and be in-charge of the work from time to time.
b. WORKS OR WORK:- The expression works or work shall unless there be something either in the subject or context repugnant so much construction, be constructed and taken to mean the work by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
c. The site shall mean the land and or other places on into or through which work is to be executed under the contract or any adjacent land, part or street through which work is to be executed under the contractor or any adjacent land, path or street which may allotted or used for the purpose of carrying out the contract.

d. CONTRACTOR:- The contractor shall mean the individual, firm or company, whether incorporated or not, undertaking the and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successor of such firm or company and the permitted assigns of such individual or firm or firms or company.
e. DRAWINGS mean the drawings referred to in the Bill of Quantities, specification and any modification of such drawings or such other drawings as many from time to time being furnished or ed by NPCC.
f. SITE :- Site means lands and other places on under, in or through which the works are to be executed or carried out and any other lands or places provided by NPCC or used for the purpose of the agreement.
g. APPROVAL means approved in writing including subsequent writte confirmation of previous verbal approval.
h. WRITING means any manuscript typed, written or printed statement under or over signature and/ or seal as the case may be.
i. MONTH means English Calendar month 'Day' means a calendar day of 24 Hrs each.
j. CONTRACT VALUE means the sum for which the tender is accepted as per the letter of intent.
k. LANGUAGE all documents and correspondence in respect of this contract shall be in English Language.
l. BILL OF QUANTITIES or SCHEDULE OF QUANTITY means the price and completed BOQ or Schedule of Quantities forming part of the tender.
m. OWNER/CLIENT – Indian Counsel of Medical Research who has awarded the work / and NPCC is acting as agent of them for the purpose of getting the work executed and entering into contract on their behalf.
n. IMPLEMENTING/EXECUTING AGENCY means NPCC.
o. TENDER means the contractor's priced offer to NPCC for the execution and completion of the work and the remedying of any defects therein in accordance with the provision of the Contract, as accepted by the letter of intent or Award letter. The TENDER is synonymous with bid and the word TENDER DOCUMENT with "Bidding Document" or "offer document".
p. The heading in the clause / condition of tender documents is for convenience only and shall not be used for interpretation of the clause / condition.
   Words imparting the singular meaning only also include the plurals and vice versa where the context requires. Words importing persons or parties shall include firms and corporations and organization having legal capacities.

2.0. INSPECTION OF SITE AND COLLECTING LOCAL INFORMATION

Before tendering, the tenderer is advised to visit the site, its surroundings to assess and satisfy themselves about the local conditions such as working and other constrains at site.

3.0. SCOPE OF WORK

3.1. The scope of work covered in this tender shall be as per the BOQ, specifications, drawings, instructions, orders issued to the contractor from time to time during the pendency of work. The drawings for this work, which may be referred for tendering provide general idea only about the work to be performed under the scope of this contract. These may not be the final drawings and may not or indicate the full range of the work under the scope of this contract. The work will be executed according to the drawings to be released as "GOOD FOR CONSTRUCTION" after approval from time to time by the Engineer-in-Charge of NPCC/ICMR and according to any addition / modification / alternation / deletions / deletions made from time to time, as required by any other drawing that would be issued to the contractor progressively during execution of work. It shall be the responsibility of the contractor to incorporated the changes that may be in the scope of work., envisaged the time of tendering and as actually required to be executed.

3.2. The quantity of various items as entered in the BOQ are indicative only and may very depending upon the actual requirement. The contractor shall be bound to carry out and complete the stipulated work irrespective of the variation in individual items specified in the bill of qualities.

4.0. VALIDITY OF TENDER.

The tender for the works shall remain open for acceptance for a period ninety days from the date of opening of price bid of tenders. The money will be forfeited without any prejudice to any right o r remedy, in case the contractor withdraws his tender during the validity period or in case he changes his offer to his which are not acceptable to NPCC. The validity period may be extended on mutual consent.

5.0. ACCEPTENCE OF TENDER

The NPCC reserves to itself the authority to reject any or all the tenders received without assigning any reason. The acceptance of a tender shall be effective w.e.f. the date on which the telegram/ letter of intent of acceptance of the tender is put in the communication by the NPCC. NPCC also reserve the right to Split the work among to or more parties at lowest rate without assigning any reason thereof. The contractor is bound to accept the portion of work as offered by NPCC after Split up at the quoted.

6.0 A. SET OF CONTRACT DOCUMENTS.

The following documents will complete a set of tender document.

i. NIT and instruction to tenderer/Pre qualification bid.
ii. General condition of the contract including special condition of the contract and prescribed formats.
iii. Schedule of rates / Bill of quantities.
iv. Technical specifications (general, additional technical specification).
v. Tender drawings.

B. Signing of Agreement.

Successful Contractor shall purchase one no. non-judicial stump paper of appropriate value as desired by the Engineer-in-Charge and shall complete all formalities and sign the agreement within 15 days of issue of letter of intent. Incase the contractor does not sigh the agreement as above all start the works his earnest money deposited with NPCC as stipulated herein below is liable to be forfeited and LOI consequently will stand withdrawn. Cost of 4 set of agreements @ Rs. 500 per set is to be born by successfully bidder.

7.0 EARNEST MONEY DEPOSIT.

Earnest money deposit of amounting as mentioned in the NIT is required to be submitted along with the tender shall be in the form of Demand Draft or Deposit call payable at place as mentioned in "Notice inviting Tenders in favor of NPCC Limited from any Nationalized / Scheduled Bank of India from a Nationalized bank. The EMD shall be valid for minimum period of 180 days (One hundred eighty days) from last day of submission of tender.

7.1 EMD shall accompany the offer and place in the sealed envelope cover of the offer as detailed in instruction of Tender. Any tender not accompanied with the requisite earnest money deposit along with letter of acceptance shall be rejected and such tenders (s) will not be allowed to attend the opening of bids.
7.2 The EMD of all unsuccessful tenders will be returned within 30 (thirty) days of the Award of the contract to successful bidder.
7.3 Once the tender has given an unconditional acceptance to the tender condition in its entirety, he is not permitted to put any remarks(s condition(s) (except unconditional rebate on price, if any) in / along – with the tender.
7.4 In case the condition 7.3 mentioned above is found violated at any time er opening of tender, the tender shall be summarily rejected and NPCC shall, without prejudice to any other right or remedy, be at liberty forfeited the full said earnest money absolutely.
7.5 No interest will be payable by the NPCC on the said amount covered under EMD/Other Security documents.
7.6 EMD of successful tenderer, if deposited in the form of Demand Draft, shall be treated as part of security deposit.

8.0. MOBILIZATION ADVANCE

No Mobilization advance will be paid.

9.0 INITIAL SECURITY DEPOSIT /PERFORMANCE GUARANTEE

Within 15 (fifteen) of after receiving LOI , the contractor shall submit to NPCC as performance Bank Guarantee in he form appended, from any Nationalized Bank, equivalent to 5% (five percent only) of contract value for the due and proper execution of the contract including already deposited earnest money. This bank Guarantee shall remain valid up- to completion of the work or preparation of final bill which ever is later.

Further security deposit or retention money shall be deducted from each running bill of the contractor @ 5% of the gross value of running account bill till it reaches 10% of the contract value including 5% initial security.
The security deposit or retention money shall be refunded to the contractor after expiry of defects liability period or on payment of the amount of the final bill whichever is later.
If the amount of Security Deposit Deduction incase more than 5.00 lacs (Rupees Five lacs only), the excess amount i.e. beyond 5 lacs. can be refunded to contractor against submission of Bank Guarantee of equivalent amount from a Nationalized ban in the prescribed pro-forma of NPCC.

However after successfully completion of work and preparation of final bill 50% of the security deposit can be released against Bank Guarantee from any Nationalized as per approved format of NPCC.

10.0 MOBILIZATION OF MEN, MATERIALS AND MACHINERY:

10.1 All expenses towards mobilization at site and de-mobilization including bringing in equipment, work force, materials, dismantling e equipments, clearing the site etc. shall be deemed to be included in price quoted and no separate payment on account of such expenses shall be entertained.

10.2 It shall be entirely the Contractor's responsibility to provide, operate and maintain all necessary construction equipments, scaffolding and safety, gadget, lifting tackles, tools and appliance to perform the work in a workman like and efficient manner and complete all jobs as per the specifications and within the schedule time of completion of work. Further contractor shall also be responsible for obtaining temporary electric and water connection for all purpose. The contractor shall also make standby arrangement for water and electricity to ensure un-interrupted supply.

10.3 It shall be responsibility of the contractor to obtain the approval for any revision and / or modification desired by him from NPCC before implementation. Also such revision and/or modifications if accepted /approved by the NPCC shall be carried at no extra cost to NPCC.

10.4 The procurement and supply in sequence and at the appropriate time of all materials and consumable shall be entirely the contractor's responsibilities and his rates for execution of work shall be inclusive of supply all these items.

10.5 It is mandatory for the contractor to provide safety equipments and gadgets to its all workers, supervisory and Technical engaged in the execution of the work while working. The minimum requirement (but not limited to) shall be gum boots, safety helmets, Rubber hand gloves, face masks ,safety nets, belts, go ogles etc. as per work requirements. The cost of above equipments/gadgets are deemed to be included the rates quoted by the contractor for the time and work as per Bill of Quantities and contractor shall not be entitled for any extra cost in these regard. The above norm is to be strictly complied with at site. In case the contractor is found to be deficient in providing safety equipments / gadgets in the opinion of Engineer-in-Charge, the Engineer-in-Charge at his option can procure the same t the risk & cost of contractor and provide the same for the use of work site and shall make the recoveries from the bills of the contractor for the same. The decision of the Engineer-in-Charge shall be final and binding on contract in this regard.

10.6 All design, drawings, BOQ, etc. except bar bending schedule, shop & fabrication drawings, for all works shall be supplied to the contractor for all buildings services and development work by NPCC in phase manner as the work progress. However it shall be the duty and responsibility of the contractor to bring to the notice of the NPCC in writi as to any variation, discrepancy or any other changes required and obtain revised drawings and designs and/ or approval of the NPCC in writing for the same.

10.7 One copy of contract documents including drawing furnished to the contractor shall be kept at the site and the same shall at all responsible times be available for inspection.

10.8 All materials, construction plants and equipments etc. once bought by the contractor within the project area, will not be allowed to be removed from the premises without the written permission of th NPCC. Similarly all enabling works built by the contractor for the main construction undertaken by hi\m, shall not be dismantled and removed without the written authority of the NPCC.

10.9 Contractor shall have to prepare the bar bending schedule, shop and fabrication drawings free of cost, if required for any of the items of work. Five copies of these drawings each including for revision will be submitted to NPCC for approval. Before executing the item, shop wings should be approved by NPCC.

11.0 INCOME TAX DEDUCTION

Income tax deductions shall be made from all payment made to the contractor including advances against work done, as per the rules and regulation in force, in accordance with the income tax act prevailing from time to time.

12.0. TAXES AND DUTIES.

12.1. The contractor shall responsible for the payment, wherever payable, at his own cost of all taxes such as excise duty, custom duty , sales tax, including the purchases tax, consignment tax, work contract tax or any other similar tax in the state concerned, turnover tax, toll tax, octroi charges, royalty. Cess, levy and other tax(es) or duty(ies) which may be specified by local/state/central govt. from time to time on all materials, articles which may be used for his work. The rate quoted by him in the tender in shall be inclusive of all such taxes, duties etc. The imposition of any new and / or increase in the aforesaid taxes, duties, levis (including fresh imposition of]work contract tax, turnover, sale tax, on work contract on any other similar tax)etc. during the currency of the contract shall be borne by contractor and shall not be paid or reimbursed to the contractor by NPCC. In the event of non-payment / defaults in payment of any octroi, royalty, cess, turnover tax, sale tax, including the purchases tax, consignment tax, work contract tax or any other similar tax in the sate concerned, customs, excise or any other levy/tax including labor dues etc. by contractor/supplier, NPCC reserve the right to with-hold the dues/ payments of contract and make payment to local/state/ central Government authorities or to labourers as may be applicable. The contract should submit along with the tender registration certificate with sale tax on work contract authority etc. other wise appropriate recovery shall be made from his bills

12.2. The rate quoted by the contractor shall be deemed to be inclusive of sale tax, Turnover Tax on works contract or any similar tax as per sales tax act applicable in the state and it shall not be reimbursed by NPCC. Tax deduction at source shall be made as per laws prevalent in the state.

12.3. It will be incumbent upon the contractor to obtain a registration certificates as a dealer under the local tax act and the central sale tax act and necessary evidence to this effect shall be furnished by the contractor to NPCC. Sale tax on the transaction between the contractor and his sub-contractor /vendors etc. shall not be reimbursed by NPCC. The contractor shall be responsible for any taxes that may be levied hereunder on the transaction betwee contractor and NPCC.

12.4. The bidder shall quote his rate inclusive of Turnover Tax/ale Tax on works contract payable to state Govt. along with other taxes, duties, levies etc. in conjunction with other terms and conditions. In case, the turnover tax/ Sale tax on works contract on execution of work s is waiver off by the State Govt. at later stage for this project, the equivalent amount from the date waiver of such tax (as per prevailing rate as on the date of waiver of such tax (as per prevailing rates as on the date of waiver of Turnover tax/Sale Tax on works contract) shall be deducted from the amount payable to the contractor for subsequent RA bill.

12.5. Service Tax – Service Tax will be reimbursed on production of valid Challan as per latest norms of the Govt. of India.

13.0. RATES TO BE FIRM.

14.1 The rates quoted by the tenderer shall be firm and fixed for the entire period of completion and till handing over of the work. No revision to rates or any escalation shall be allowed on account of any increase in price of materials, labor, POL and overheads etc or any other statutory increase during the entire contract period.

14.2 The contractor shall be deemed to have inspected the site, its surrounding and acquainted itself with the nature of the ground, accessibility of the site and full extent and nature of all operations necessary for the full and proper execution of the contract, space for storage of materials, constructional plant, temporary works, restrictions on the playing of heavy vehicles in area, supply and use f labor, materials, plant, equipment and laws, rules and regulation, if any imposed by the local authorities.

14.0. ESCALATION / PRICE VARIATION.

No claim on account of any price variation / Escalation on whatsoever ground shall be entertained at any stage of works. All rate as per BOQ quoted by contractor shall be firm and fixed for entire contract period as well as extended period for completion of the works. No escalation price variation clause shall be applicable on this contract.

15.0. INSURANCE OF WORKS ETC.

Contract is required to take contractor's all risk policy (as the case may be) from the approved insurance company in the name of NPCC and bear all cost towards the same for the full period of of works including the defect liability period for the full amount of contract against all loss of damage from whatever cause arising other than expected risks for which he is responsible under the terms of the contract and in such manner that the NPCC and the contractor are covered during the period of construction of works and/ or also covered during the period of defect liability for loss or damage:

a. The work and the temporary works to the full value of such works.
b. The materials, constructional plant, centering, shutte and scaffolding materials and other things brought to the site for their full value.
c. Whenever required by NPCC, the contractor shall produce the policy or the policies of insurance and the receipts for payment of the current premiums.

20 No labor below the age of 18 years shall be employed on the work.

21. LABOR SAFETY PROVISION

The contractor shall be fully responsible to observe the labor safety provisions.

23.0. LAW GOVERNING THE CONTRACT

This contract shall be governed by the Indian Laws for the time being in force.

26. TECHNICAL STAFF FOR WORK

26.1. The contractor shall employ at t his cost the adequate number of technical and other staff during the execution of this work depending upon the requirement of work. For this purpose the numbers to deployed, their qualification, experience as decided by NPCC shall be final and binding on contractor. The contractor shall be entitled for any extra payment in this regard. The technical staff should be available at site, whenever required by NPCC to take instruction.

26.2 In case the contractor fails to employ the staff as aforesaid he shall be liable to pay a reasonable amount of not exceeding a s of Rs. 5,000.00 (Rs. five thousand only) for each month of defaults in the case of each person. The decision of the Engineer-in-Charge as to number of Technical staff to be adequate for the project and the period for which the required technical staff was not employed by the contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the contractor as to the amount and the contractor's liability to pay the said amount.

28. WATCHING AND LIGHTING :-

The contractor shall at his own cost take all precautions to ensure safety of life and property by providing necessary barriers, watchmen etc. during the progress of work as directed by Engineer-in-Charge.

29. HEALTH & SANITARY ARRANGEMENT

In case of all labor directly or indirectly employed in work for the performance on the contractor's part of this contract, the contractor shall comply with all rules framed by Govt. from time to time for the protection of health and sanitary arrangement for workers.

31. MINIMUM WAGES ACT.

The contractor shall comply with all the provision of the minimum wages Act, 1948, contract labor Act (R&A) 1970, and rules framed there under and other labor laws / local laws affecting contract labor that may be brought into force from time to time.

33. SECURED ADVANCE AGAINST NON- PERISHABLE MATERIALS.

Interest free secured advance up-to a maximum of 75% (seventy FIVE percent) of the market value of the materials or the cost of materials as delivered from the tendered item rate of the contractor, whichever is less, required for incorporation in the permanent works and brought to site and duly certificate by NPCC site Engineer shall be paid to the contractor for all non-perishable items as per NPCC/MOST norms. The advance will be paid only on submission of Bank Guarantee in the prescribed pro-forma. The advance shall be recovered in full from next running account bill and fresh advance paid for the balance quantities of materials. The contractor shall construct suitable go-down at the site of work for safe storing the materials against any possible against due to sun, rain, dampness, fire, theft etc. at his own cost. He shall also employ necessary watch and ward establishment for the at his own cost and risk.

34. MEASUREMENT OF WORKS.

Unless otherwise mentioned in the bill of quantities t measurement of works shall be done as per technical specifications (as specified in Technical Specification of the tender) and if the same is not given in the technical specification, the same shall be measured as pre latest BIS codes in force. The quantity of steel reinforcement/sheet and the structural steel sections incorporated in the work shall be measured & paid on the basis of standard coefficient of sections per BIS codes of practice.

35. PAYMENT

35.1 The bill shall be submitted by contractor each month on or before the Date fixed by the Engineer-in-Charge for all works executed in previous months. The contractor shall prepare computerized bills using the program as approved by Engineer-in-Charge as per prescribe format/pro-forma. The contractor shall submit five numbers of hard copies and one soft copies of floppy/ CD for all bills. Subject to clause 35.3 herein below, due of the contractor shall be made within fifteen days of the payment getting the measurement verified from the Engineer-in-Charge or his subordinate / representative and certification of bill by the Engineer-in-Charge.

35.1. A Payments Terms:-

Monthly Running Account Bill (R.A Bill) shall be Prepared by the contractor based on executed quantity as per BOQ and presented before the NPCC for payment.

35.2 All running payment shall be regarded as payment by way of advance against the final payment only and not as payments for work actually done and completed and/ or accepted by NPCC and shall not preclude the recovery for bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the contract, or any part thereof, in this respect, or the accruing of any claim, nor shall it conclude, determine or affect in any way the powers of the NPCC under these]condition or any them as to the final settlement and adjustments of then accounts or otherwise, or in any other way vary/ affect the contract. The final bill shall be submitted by the contractor within three months of the completion of work, otherwise NPCC's certificate to be measur t and of the total amount payable for the work accordingly shall be final and binding on contractor.

35.3 All payment shall be released by NPCC by payee's Account cheque. In case of payment is made by Demand Draft at the request of the contractor, Bank commission charges shall be debited to the account of contractor.

36.0 WORK ON SUNDAYS, HOLIDAYS AND DURING NIGHT.

For carrying out work on Sunday and holidays or during night, the contractor will approach the Engineer-in-Charge or his representative at least two days in advance and obtain his permission. T Engineer-in-Charge at his discretion can refuse such permission. The contractor shall have no claim on hid account whatsoever. If work demand, the contractor shall make arrangement to carry out the work on Sundays, Holidays and in two, Three shifts with the approval of Engineer-in-Charge at no extra cost to NPCC.

37. NO IDLE CHARGES TOWARDS LABOUR OR P & M ETC.

No idle charges or compensation shall be paid for idling of the contractor's labor, staff or P&M etc. on any ground or due to any reason whatsoever. NPCC will not entertain any claim in the respect.

38. WORK TO BE EXECUTED IN ACCORDANCE WITH SPECIFICATIONS, DRAWINGS, ORDERS ETC.

The contractor shall executed the whole and every part of work in the most substantial and workman like manner both as regard materials and otherwise in every respect in strict accordance with the specification. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instruction of writing in respect of the work assigned by the Engineer-in-Charge and the contractor shall be furnished free of charges one copy of the contract document together with specification, design, drawings.

The contractor shall comply with the provisions of the contract and execute the works with care and diligence and maintain the works and provide all labor and materials, tool and plants including for measurement and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these is specified or is reasonable inferred from the contract. The contractors shall take full responsibility for adequacy, suitability and safety o all the works and methods of construction.

39. DIRECTION FOR WORKS

39.1 All works to be executed under the contract shall be executed under the direction and subject to approval in all respect of the Engineer-in-Charge of NPCC who shall be entitled to direct at what point or points and in what manner works are to be commenced and executed.

39.2 The Engineer-in-Charge and his representative shall communicate or confirm their instruction to the contractor in respect of the execution of work during their site inspection in a 'Works Site Order Book' maintained at the site office of Engineer-in-Charge. The contractor or his authorized representative shall confirm receipt of such instruction by signing against the relevant orders in the book.

40. ORDER OF PRECEDENCE OF DOCUMENTS.

In case difference contradiction, dispensary, dispute regard to conditions of contract, specification, drawings, bill quantities and rates quoted by the contractor and other documents forming part of the contract, the following shall prevail in order of preference.

i. Fax, telegram or letter of Intent, details letter of work order along with statement of agreed variation and its enclosures.
ii. Bill of Quantities / Schedule of Quantities.
iii. Special Condition of Contract.
iv. Technical specification (General, Additional and technical Specification) as given in tender documents.
v. General Condition of Contract.
vi. Drawings.
vii. Technical specifications (as specified in Technical Specification of the tender) updated with correction slips issued up to last date or receipts of tender.
viii. Relevant BIS codes.

42.0. WATER AND ELECTRICITY – Power and Water Supply are available at site.

46. SCHEDULE OF RATES .

46.1. The quantities shown against the various items of work only approximate quantities which may vary as per the actual requirement at site.

46.2. All items of work in the bill of quantities / schedule of quantities shall be carried out as per the CNPCC/ MOST (as the case may be) specification, drawings and instructions of the Engineer-in-Charge of NPCC and the rate shall include for supply of required materials including proper storage, consumables, skilled and unskilled labor, supervision and tools, tackles, plant & machinery complete as called for in the detailed specifications and condition of the contract. No item which is not covered in the bill of quantities shall be executed by the contractor without the approval of the NPCC. In case ant Extra/substituted item is carried out without specific – approval, the same will not be paid.

47. ANTI – TERMITE TREATMENT - All material should be termite resistance.

48.0 INDIAN STANDARDS

Wherever any reference is made any IS in any particular specification, drawings or bill of quantities, it mean the Indian standards edition with the amendments current at the last date of receipt of r documents.

52.0 MATERIALS AND SAMPLES

52.1 The materials / products used on the work shall be one of the approved make/ brands out of list of manufacturers/ s en in the tender documents. The contractor shall submit samples/ specimens out of approved makes of materials / products to the Engineer-in-Charge for prior approval. In exceptional circumstances Engineer-in-Charge may allow alternate equivalent makes / brands of products / materials at his sole direction. The final choice of brand/ make shall remain with the engineer-in-Charge, whose decision in the matter shall be final and binding and nothing extra on this account shall be payable to the contractor.

In case single band / make is mentioned, other equivalent makes/ considered by the Engineer-in-Charge with prior approval. In case of variance in NPCC/IS/BIS specifications from approved products/makes specification, the specificati of approved product /make shall prevail for which nothing shall be paid extra to the contractor.

In case no make or band of any materials, articles, fittings and accessories etc. is specified, the same shall comply with the relevant Indian Standard Specifications and shall bear the ISI/BIS mark. The Engineer of NPCC and the owner shall have discretion

to check quality of materials and equipments to be incorporated in the work, at source of supply or site and even the incorporation in the work. They also have the discretion to check the workmanship of various items of work to be executed in this work. The contractor shall provided the necessary facilities and assistance for the purpose.

52.2 The above provisions shall not absolve the contractor the quality of final product and in getting the materials and workmanship quality checked and approved from the Engineer-in-Charge of NPCC.

52.3 The contractor shall well in advance, produce samples of materials, articles, fittings. Accessories etc. that he proposes to use and get them approved in writing by NPCC. The materials articles etc. as approved shall be labeled as such shall be signed by NPCC and the Contractor's representative.

52.4. The approval samples shall be kept in the custody of the Engineer-in-Charge of NPCC till completion of the work. Thereafter the samples except those destroyed during testing shall be returned to the contractor. No payment will be made to the contractor for the samples or samples destroyed in ng.

52.5 The brands of all materials, articles fittings etc. approved together with the name of manufacturers and firm from supplies have been arranged shall be recorded in the site order book.

53.0 TESTS AND INSPECTION

53.1. The contractor shall carry out the various mandatory tests as per specifications and the technical documents that will be nished to him during the performance of the work.

All the test on materials, as recommended by NPCC. MOST and relevant Indian Standard codes or other standard specifications (including all amendment current at the last date of submission of tender documents) shall be got carried out by the contractor at the field testing laboratory or any other recognized institution/ laboratory, at the direction of the NPCC. All testing charges, expenses etc. shall be borne by the contractor.

All the tests, either on the field or outside laboratories concerning the execution of the work and supply of materials shall be got carried out by the contractor or NPCC at the cost of the contractor.

53.2. WORKS TO BE OPEN TO INSPECTION

All works executed or under the course of execution in pursuance of this contract shall at all times be open to inspection and supervision of the NPCC. The work during its progress or after its completion may also be inspected, by Chief technical Examiner a of government of India (CTE) and/ or an inspecting authority of state govt. of state in which work is executed and/or by third party checks by owner / clients. The compliance of observations / improvement as suggested the inspecting officers of NPCC/CTE /State authorities/ owners shall be obligatory on the part of the contractor at the cost of the contractor

56.0 CARE OF WORKS. :- From the commencement to the completion of the works handing over to the NPCC and contractor shall take full responsibility for the care thereof and all temporary works and in case any damage loss or injury shall happen to the works or to any part thereof or to any temporary works due to lack of precaution / negligence on part of contractor, the same shall be made good at his own cost.

57.0. NO COMPENSATION FOR CANCELLATION / REDUCTION OF WORKS

If at any time after the commencement of the work the CC shall for any reason whatsoever is required to abandon the work is not require the whole work thereof as specified in the tender to be carried out, the Engineer-in-Charge shall give notice in writing of the fact the contractor, who shall have no claim to any payment of compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full, but which he did not derived in consequence of the full amount of the work not having n carried out or fore-closure, neither shall he have may claim for compensation by reason of any alterations having been made in the original specifications, drawings and instructions which shall any curtailment of the work as originally contemplated.

Provided that the contractor shall be paid the charges of the cartage only of materials actually and bonafide brought to the site of the work by the contractor and rendered surplus as a result of abandonment or curtailment of the work or any portion thereof and then taken back by the contractor, provided however, that the Engineer-in-Charge shall have in all such cases the option of taking over the case of such stores having been issued by NPCC and return by the contractor to NPCC, credit will be given to him by the Engineer-in-Charge at rate not exceeding those at which they were originally issued to him after taking into consideration any deduction for claim on account of any deterioration or damage while in the custody of the contractor and in hid respect the decision of the Engineer-in-Charge shall be final.

59.0 PROHIBITION ON SUBLETTING

59.1. The contractor shall not sublet or assign the whole or part of the works except where otherwise provided, by the contract and even then only with the prior written consent of the NPCC and such consent if given shall not relive the contractor from ant liability or under the contract and he shall be responsible for the acts, defaults or neglects of any sub-contractor, his agent, servants or workman as full as they were the acts, the defaults or neglects of the contractor, his agent servants or workman provided always that the provision of labor on piece work basis shall not be deemed to be a subletting under this clause.

59.2. The contractor may entrust specialist items of works to the agencies specialized in the specific trade. The contractor shall give the names and details of such firm whom it is going to employ for approval of NPCC. These details shall include the expertise, financial status, technical manpower, equipment, resources and list of works executed and on hand of the specialist agency.

60.0 SETTING OUT OF THE WORKS.

The contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the work. If at any time during the progress of works, shall any error appear or arise in the position, levels, dimensions or alignment of any part of the work, the contractor shall at his own expenses rectify such error to the satisfaction of Engineer-in-Charge. The checking of any setting out or of any line or level by the engineers of NPCC shall not in any way relieve the contractor of his responsibility for the correctness.

61.0 NOTICE BEFORE COVERING UP THE WORK.

The contractor shall give not less then seven days notice before covering up or otherwise placing beyond the reach of measurement any work, to the Engineer-in-Charge in order that the same may be inspected and measured. If any work is covered up or placed beyond t reach of inspection/measurement without such notice or his consent being obtained the same shall be uncovered at the contractors expenses and he shall have to make it good at his own expenses.

64.0. SITE CLEARAING.

64.1. The contractor shall ensure that the working site is kept clean and free obstructions for easy access to job site and also from safety point of view. Before handing over the work to the NPCC the contractor shall removed all temporary structures like the site offices, cement go-down, stores, labour, hutments etc. scaffolding rubbish, left over materials tools and plants, equipments etc., clean and grade the site to the entire satisfaction of the Engineer-in-Charge. If this is not done the same will be got done by NPCC at his risk and cost.

64.2 The Contractor shall clean all floors, remove cement/lime/paint / drops and deposits, clean joinery, glass panes etc. touching all printer's works and carry out all other necessary items of works to make the premises clean and tidy before handing over the building, and the rate quoted by the contractor shall be deemed to have include the same.

65.0. SET-OFF CONTRACTOR;S LIABILITY

NPCC shall have the right to deduct or set of the expenses incurred or likely to be incurred by it in rectifying the defects as aforesaid from any or against any amount payable to the contractor under agreement including security deposit and proceeds of performance guarantee.

70.0 ACTTION AND COMPENSATION PAYABLE IN CASE OF BAD WORK.

It shall appear to the Engineer-in-Charge or his authorized subordinate in change of the work or to the Chief Technical Examiner or to any other inspecting agency of Government/ State Government / wner where the work is being executed, that any work has been executed with unsound, imperfect, or unskillful workmanship or with materials of any inferior description, or that any materials or article provided by him for the execution of the work are unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract, the contractor shall on demand in writing which shall be made within six month of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part as the case may required or as the case may be, remov e materials or articles so specified in whole or in part of the case may required or as the case may be, removed the materials or article sat his own proper charge and cost, and in the event of his failing to do so within a period to be specified by the Engineer-in-Charge in hid demand aforesaid, then the

contractor shall be liable to pay compensation at the of one percent on the estimate amount put to tender for every day no exceeding ten days, while his failure to do so shall continue and in the case of any such failure, the Engineer-in-Charge may rectify or remove and re-executed the work or remove and replace with others, the materials or articles complied of as the case may be at the risk and expenses in all respects of the contract.

72.0 COMPENSATION FOR DELAY AND REMEDIES.

72.1. If the contractor fails to maintain the required progr in terms of relevant clause of contract, to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the low to the Govt. on account of such breach, pay as agreed the amount calculated at the rate stipulated below or smaller amount as the Engineer-in-Charge (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every complete day /week (as applicable) that the progress work remains incomplete.

i. Completion period (as originally stipulated) @1% per day
Not exceeding 3 month.

ii. Completion period (as originally stipulated)
Exceeding 3 month. @ 1% per week

Provided always that the total amount of compensation for delay to be paid under the condition shall not exceed 10% of the tendered value.

The amount of compensation may be adjusted or set-off-against any sum payable to the contractor under this or any other contract with NPCC.

72.2 CANCELLATION / DETERMINATION CONTRACT IN FULL OR PART.

Subject to other provision contained in this clause the Engineer-in-Charge may, without prejudice to his any other rights e contractor in respect of any delay, interior workmanship, any claims or damage for damage and / or any other provision of his contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases.

i. If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an in an inefficient or otherwise improper o or un-workmanlike manner shall omit to comply with the requirement of such notice for a period of seven days thereafter ;or.

ii. If the contractor has, without reasonable cause, s ed the progress of the work or has failed to process with the work with due diligence so that the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date from completion and continues to do so after notice in writing of seven days from the Engineer-in-Charge ;or.

iii. If the contractor fails to complete the works within the stipulated date or items of work with individual date or completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge ;or.

iv. If the contractor persistently neglects to carry out his obligations under the contract and / or commits default in complying with any of the terms and conditions of the contract and does not emedy it or take effective step to remedy it within 7 days after a notice in writing is given to him in that behalf of the Engineer-in-Charge ; or.

v. If the contractor shall offer to give or agree to give to any person in NPCC service or to any other person on behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any action relation to the obtaining or execution of this or any other contract for NPCC ; or.

vi. If the contractor shall enter into a contract with NPCC in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge; or,

vii. If the contractor shall obtained a contract with NPCC as a result of wrong tendering or other non-bona-fide methods of competitive tendering; or.

viii. If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administrative of his estate made against him or shall take any proceeding for liquidation or composition (other a voluntary liquidation for the purpose of amalgamation or reconstruction) under any insolvency act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any insolvency act for the time being in force for the sequestration on his estate or if a trust deed be executed by him for benefit o f his creditors; or.

ix. If the contractor being a company, shall pass resolution or the court shall make an order for the winding up of the company, or a receiver or manage on behalf of the debenture holders or otherwise shall be

appointed or circumstances shall arise which entitled e court of debenture holders to appoint a receiver or manager; or.

x. If the contractor shall suffer an execution being levied on his goods and allow it to be continue for a period of 21 days; or.

xi. If the contractor assigns, transfers, sublets (engagement of labor on a piece-work basis or of the labor with materials not to be incorporated in the work parts with the entire works or any portion thereof without and prior written approval of the Engineer-in-Charge.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge may without prejudice to any other right or remedy which shall have accrued or shall accrue hereafter to NPCC, by a notice in writing to cancel the contract as a whole or any such items of work is default from the contract.

The Engineer-in-Charge shall on such cancellation by the NPCC have powers to:

a. take possession of site and materials, constructional plant, implements, stores, etc. thereon; and/or.

b. Carry out the in completed work by any means at the risk and cost of the contractor ; and/or.

c. To determine or rescind the contract as aforesaid (which termination or rescission notice in writing to the contract under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such deter or rescission the full security deposit recoverable under the contract shall be liable to be forfeited and un-used materials, constructions plants, implements, temporary buildings, etc. shall be taken over and shall be absolutely at the disposal of the NPCC. If any portion of the Security Deposit has not b paid or received it would be called for and forfeited ; and/or.

d. The employee labor paid by the department and to supply materials to carry out the work or any part of the work debiting the contractor with the cost of the labor and the price of the materials (of the amount of which) cost and price certificate by the Engineer-in-Charge 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 rates as if it had been carried out by the contractor under the terms of this contract. The certificate of the Engineer-in-Charge as to the value of the work done shall be final and conclusive against the contractor provided always that action under the sub-clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be paid to the contractor; and/or.

e. After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance part thereof as shall be un-executed or delayed with reference to the General Condition of Contract Relevant clause of special condition of contract, out of his hands and to give it to another contract 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 the account of which excess the certificate in writing of the Engineer-in-Charge shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by NPCC under his contract or on any other account whatsoever or from his security deposit the proceeds of sale of unused materials, construction plants implements temporary building etc. thereof of a sufficient part thereof as the case may be. If the expenses incurred by the NPCC are less than the amount payable to the contractor at his agreement rates, the difference shall not be paid to the contractor; and/or.

f. By a notice in writing to withdraw from the contract items or items of work as the Engineer-in-Charge may determine in his absolute discretion and get the same executed at the risk and cost of the contractor.

Any excess expenditure incurred or to be incurred by in completing the works or part of the works or the excess loss or damages suffered or may be suffered by NPCC as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to NPCC in law recovered from any moneys due to the contractor on any account, and if such moneys are not sufficient the contractor shall be called upon in writing and shall be the liable to pay the same with in 30 days.

If the contractor shall fail to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors unused materials, constructional plant, implements, temporary buildings, etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the contractor under the contract and if thereafter there be any balance outstanding from the contractor, it shall be recovered in accordance with the provisions of the contract and low.

Any sums in excess in the amounts due to NPCC and unsold materials, constructional plant etc. shall be returned to the contractor, provided always that if cost or anticipated cost of completion by NPCC the works is less than the amount which the contractor would have been paid had he completed the works or part of the works, such benefits shall not accrue to the contractor.

In the event of anyone or more of the above course being adopted by the Engineer-in-Charge the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procure any materials or entered in to any engagement or made in advances on account or with a view of the execution of the work of the performance of the contract. And in case action is taken under any of the provision aforesaid the contractor shall not be entitled to recover or to be paid any sum for any work thereof or actual per[formed under this contract unless and until the Engineer-in-Charge has 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.

Provided further that if of the recoveries to be made, while taking action as per (d) and / or (e) above, are in excess cost incurred by the department exceeds the security deposit]so forfeited.

72.3 CONTRACTOR LIABLE TO PAY COMPENSATION EVEN IF ACTION NOT TAKEN:-

In any cases in which any of the powers conferred upon the Engineer-in-Charge by relevant clause thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such power shall not be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he do desires after giving a notice in writing to the contractor take procession of (or the sole discretion of the Engineer-in-Charge which shall be final and binding in the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plants, materials and stores in or upon the works, or the site thereof belonging to the or any tools, plant, materials and stores, in or upon the wor e site

thereof belonging to the contractor, or procured by the contract and intended to the use for the execution of the work or any part therof, paying or allowing for the same in account at the contract rates, or in the case of these not being applicable , at current market rates to be certifies by the Engineer-in-charge m whose certificate there of shall be final, and binding on the contractor and /or direct the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-charge may remove them at the contractor's expenses or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

72.4. THE ESSENCE OF CONTRACT & EXTENSION FOR DELAY

The item allowed for execution of the works as specified in the terms of contract of the extended time in accordance with these condition shall be essence of the contract. The execution of the work commence from the 10^{th} day or such time period as mentioned in letter of award after the date on which the Engineer-in-Charge issued written orders to commence the work of from the date of handing over the site whichever is later. If the contractor commits default in commencing the execution of the work as aforesaid, the execution agency shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money absolutely.

72.4.1 Within 10 (ten) days of letter of intent, the contractor shall submit a time and progress chart (CPM/PERT/ quantified bar chart). And get it approved by the Engineer-in-Charge. The chart shall be prepared in direct relation to the same stated in the contracts documents for completion of items of the works. It shall indicate the forecast (mile-stone) of the date of commencement and completion of various items, trades, sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work exceeds one month (save for special jobs for which a separate programme has been agreed upon) complete $1/8^{th}$ of the whole of work $1/4^{th}$ of the whole item allowed in the contractor has elapsed $3/8^{th}$ of the work before]one half of such time has elapsed and $3/8^{th}$ of the work before $3/4^{th}$ of such time has elapsed. The physical report including photograph shall be submitted by the contractor on the prescribed

format & the intervals (not later than one month) as by the Engineer-in-Charge. The compensation for delay as per clause 72.1 be leviable at intermediate stage also, in case the require is not achieved to meet the above time deadlines of the completion period and/ or milestone of time and progress chart provided always that the total amount of compensation for delay to be paid unde this condition shall not exceeds 10% of the tendered value of work.

72.4.2 if the work (s) be delayed by:

i) force-majeure or
ii) abnormally bad weather, or
iii) Serious loss or damage by fire, or
iv) Civil commotion of workmen, strike or lockout, affecting any or the trades employed on the work , or.
v) Delay on the part of other contractor or trades man en ed by Engineer-in-Charge in executing work not forming part of the contractor, or.
vi) Non-availability or stores, which are responsibility of the NPCC or,
vii) Non availability or breaks down of tools and plant to be supplied by NPCC or.
viii) Any other causes which, in the absolute discretion of the NPCC, is beyond the contractor's control.

Then upon the happening of any such event causing delay, the contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall all the may reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

72.4.3 Request for extension of time, to be eligible for consideration, shall be made by the contractor in writing wi0thin fourteen days of the happening of the even causing delay on the prescribe form. The contractor may also , if practicable, indicate in such a request the period for which extension is desired.

In any such case NPCC may give a fair and reasonable e of time for completion of work. Such extension shall be communicated to the contractor by the Engineer-in-Charge in writing, within 3 month of the date of receipt of such request. No application by the contractor for extension o f time shall not be a bar for giving a fair and reasonable extension by the Engineer-in-Charge and this shall be binding on the contractor.

73.0 WITHHOLDING AND LEIN OF PAYMENT.

Whether any claim o r claims for payment of money arises out of or under the contract against the contractor, the Engineer – in- Charge of NPCC shall be entitled to withhold and also to have a lien to retain in whole or in part, the security deposit, performance guarantee and or to withhold and have a lien to retain in part or full the payment due to the contractor or any claims of the contractor for any contract with NPCC ltd. So as to cover the claimed amount till the claim arising out of or under the contract is determined by the arbitrator /competent court / competent authority.

74.0 DEFECTS LIABILITY PERIOD

The contractor shall be responsible for the rectification of defects in the works for a period twelve months from the date of taking over of the works by the Owner / Client. Any defects discovered and brought to the notice of the contractor forthwith shall be attended to and rectified by him at his own cost and expense. In case the contractor fails to carry out these rectifications, the same may without prejudice to any other right or remedy available, be rectified by NPCC at the cost and expense of the contractor.

75.0 FORCE MAJEURE

Any delay in or failure of the performance of either party hereto shall not constitute default hereunder to give rise to any claims for damages, if any to the Extent such delay or failure of performance ences such as acts of God or the public enemy , expropriation, compliance with any order or request of Government authorities, acts of war, rebellions, sabotage fire, floods, illegal strikes, or riots (otherwise than among the contractors employees). Only extension of time shall be considered for Force Majure conditions as accepted by NPCC. No adjustment in contract price shall be allowed for reasons of force majeure.

76.0 ARBITRATION –

Both the parties shall make efforts to settle the disputes or differences amicably. If amicable settlement is not possible the same shall be referred to the sole arbitrator of Chairman and managing Director of NPCC or the person appointed by CMD, NPCC and the decision of the arbitrator shall be final and binding on both the parties. Arbitration shall be accorded in Indian arbitration and conciliation Act. 1996.

77. JURIDICTION

The agreement is deemed to be executed at Jodhpur and the Courts in Jodhpur alone will have jurisdiction to deal with matters arising there from.

78. SUSPENSION OF WORKS

(a) The contractor shall, on receipt of the order in writing of the Engineer-in-charge, suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-charge may consider necessary for any of the following reasons:

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

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

iii) 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 Engineer-in-charge.

(b) If the suspension is ordered for reasons (ii) and (iii) in sub-para (a) above

i) The contractor shall be entitled to an extension of the time equal to the period of every such suspension plus 25%. No adjustment of contract price will be allowed for reasons of such suspension.

ii) In the event of the Contractor treating the suspension as an abandonment of the Contract by NPCC , he shall have no claim to payment of any compensation on account of any profit or advantage which he may derived from the execution of the work in full.

79. TERMINATION OF CONTRACT ON DEATH OF CONTRACTOR

Without prejudice to any of the right or remedies under this contract if the contractor dies, the Engineer-in-charge shall have the option of terminating the contract without compensation to the contractor.

If the contractor will not executed the works as per the construction programme or time scheduled entered the agreement including time extension if any due to the reasons attributable to him, NPCC reserves the right to terminate or reduce his contract at any stage of contract period and got executed the work at the risk and cost the contractor.

80. CLARIFICATION AFTER TENDER SUBMISSIION

Tenderers attention is drawn to the fact that during the period, the bids are under consideration, the bidders are advised to refrain from contacting by any means, the NPCC and/or his employees/representatives on matters related to the bid under consideration and that if necessary, NPCC will obtain clarifications in writing or as may be necessary. The tender evaluation process of award of works is done by duly authorized Tender Security Committee and this committee is authorized to discuss and get clarification from the tenderers.

81. ADDENDA / CORRIENDA.

Addenda/Corrigenda to the tender documents may be issued prior to the date of opening of the tender to clarify or effect modification in specification and / or contract terms included in various tender documents. The tenderer shall suitably take into consideration such Addenda/Corrigenda while submitting his tender. The te er shall return such Addenda/Corrigenda duly signed and stamped as confirmation of its receipt and submit along with the r document. All addenda/Corrigenda shall be signed and stamped as confirmation of its receipt and submit along with the tender documents. All addenda / corrigenda shall be signed and stamped on each page by the tenderer and shall become part of the tender and documents.

82. QUALITY ASSURANCE PROGRAMME

To ensure that the services under the scope of this contract are in accordance with the specifications, the Contractor shall adopt Quality Assurance Programme to control such activities at the necessary points.

The contractor shall prepare and finalize such Quality Assurance Programme within 15 days from letter of intent. NPCC shall also carryout quality audit and quality surveillance of systems and procedures of Contractor's quality control activities. A Quality Assurance Programme of Contractor shall generally cover the following:

a) His organization structure for the management and implementation of the proposed Quality Assurance Programme.

b) Documentation control system.

c) The procedure for purpose of materials and source inspection.

d) System for site controls including process controls.

e) Control of non conforming items and systems for corrective action.

f) Inspection and test procedure for site activities.

g) System for indication and appraisal of inspection status.

h) System for maintenance of records.

i) System for handling, storage and delivery.

j) A quality plan detailing out quality practices and procedures, relevant standards and acceptance levels for all types of work under the scope of this contract.
The entire cost associate with all testing of materials required as per technical specifications or by the Engineer-in-Charge shall be included in the contractors provision in his quoted rates in the schedule of quantity.

83. APPROVAL OF TEMPORARY /ENABLING WORKS

The setting and nature of all offices, huts, access road to the work areas, and all other temporary works as may be required for the proper execution of the works shall be subject to approval of the Engineer-in-charge.
All the equipments , labour, material including cement, reinforcement and the structural steel required for the enabling/temporary works associated with the entire Contract-shall have to be arranged by the Contractor only. Nothing extra shall be paid to the Contractor on this account and th unit rates quoted by Contractor for various items in the Bill of Quantities shall deemed to include the cost of enabling works.

84. CONTRACT COORDINATON PROCEDURES, COORDINATION MEETINGS AND PROGRESS REPORTING
The Contractor shall prepare and finalize in consultation with NPCC, a detailed contract coordination procedure within 15 days from the date of issue of Letter of Intent for the purpose of execution of the Contract.

The Contractor shall have to attend all the meetings at any place in India at his own cost with NPCC, Owners/Clients or Consultants of NPCC /Owner/Client during the currency of the Contract, as and when required and fully cooperate with such persona and agencies involved during these discussions. The Contractor shall not deal in any way directly with the Clients/owners or Consultants of NPCC/Owner/Clients and any dealing/correspondence if required at any time with Clients/Owners/Consultants shall be through NPCC only.

During the execution of the work , Contractor shall submit at his own cost a detailed Monthly progress report to the Engineer-in-charge of NBCC by 5th of every month. The format of monthly progress report shall be as approved by Engineer-in-charge of NPCC.

85. MANNER OF EXECUTION OF CONTRACT AGREEMENT

The Contractor shall enter into a Contract Agreement with the NPCC within 15 days from the date of Letter of Intent or within such extended time, as may be granted by the NPCC. The cost of stamp papers, stamp duty, registration, if applicable on the contract, shall be borne by the Contractor. In case , the contractor does not sign the agreement as above or sta the work within 15 days of the issue of letter/telegram of intent, his earnest money is liable to be forfeited and letter of intent consequently will stand withdrawn.

86. MANAGER OF EXECUTION OF AGREEMENT

I) The agreement as per prescribed Performa enclosed to the Special Conditions of Contract shall be signed at the office of the NPCC n 15 days from the date of issue of letter of intent. The Contractor shall provide for signing of the Contract, appropriate Power of Attorney and the requisite documents /materials. Unless and until a formal contract is prepared and executed, the Letter of intent read in conjunction with the Bidding documents will constitute a binding contract.
ii) The agreement will be signed in three originals and the Contract shall be provided with one signed original and the other two originals will be retained by NPCC.

87. CHANGE IN FIRM'S CONSTITUTION TO BE INTMATED
Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-charge shall be obtained before any change is made in e constitution of the firms. Where the contractor is an or a Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by e contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 59.1 hereof and NPCC shall be entitled to take action under Clause of the agreement.

88. CONSULTANCY CHARGES/DRAWING AND DESIGN – Lowest bidder has to submit at least two to three alternative drawings of major components matching with specifications of items as stipulated with the BOQ for approval of ICMR/NPCC within a month for which additional payment @ 1% of total executed net value will be paid as extra in additional to quoted rates. It will be sole responsibility of the lowest bidder to get approval of all working drawings from ICMR and other statutory bodies.

90. INSPECTION VEHICLES/TELEPHONE/OFFICE/STATIONARY.

An amount of Rs. 20,000.00 (Twenty thousand) for vehicle, and Rs. 1000.00 (one thousand) for stationary all together Rs. 21,000.00 per month per month will be recovered from the agency for inspection vehicle /stationary during the whole contract period including extended period of the contract if any.

91. RECOVERY FOR CESS - Labour cess will be recovered as per Govt. Notifications.

92. RECOVERY FOR LABROTARY TEST :- As per approved rates for Different tests on Building Materials in the department of Civil Engineering of the NIT or IIT Delhi will be made if required and agency fail to submit test reports as per requirement or recovery will be made accordingly.

93. COST OF OUT SOURCING: For outsourcing BOQ and conceptual drawings recovery will be made from the agency @ 1.06% of estimated cost.

APPLICATION FOR EXTENSION OF TIME

(To be completed by the contract)

P A R T – 1

1. Name of the contractor.

2. Name of the work as given in the Agreement.

2. Agreement No.

3. Estimated amount put to tender.

4. Date of commencement work as per agreement.

5. Period allowed for completion of work as per agreement

6. Date of completion stipulated as per agreement.

7. Period for which extension of time
Has been give previously.

a) First extension vide Engineer-in-Charge letter No. …….date	Month	Days
b) 2nd extension vide Engineer-in-Charge letter No. …….date	Month	Days
c) 3rd extension vide Engineer-in-Charge letter No. …….date	Month	Days
d) 4th extension vide Engineer-in-Charge letter No. …….date	Month	Days
Total extension previously given		

8. Reasons for which extension have been previously given (copies of the previous application should be attached).
9. Period for which extension is applied for:
10. Hindrance on account of which extension is applied for with dates on which hindrance occurred, and the period for which these are likely to last.

a. Serial no.
b. Nature of Hindrance
c. Date of Occurrence
d. Period for which it is likely to last.
e. Period for which extension required for this particular hindrance.
f. Over lapping period, if any, with reference to item.
g. Net extension applied for.
h. Remarks, if any

Total period for which extension is now applied for an account of hindrances mentioned above…….. month/ days.

11. Extension of time required for extra work.

12. Detail of Extra work and on the amount involved :

a) Total value of extra work.
b) Proportionate period of extension of time based on estimated amount put to tender on account of extra work. .

13. Total Extension of time required for 11 & 12

Submitted to the Engineer-in-Charge

SIGNATURE OF CONTRACTOR

APPLICATION FOR EXTENSION OF TIME

(PART – II)

1. Date of receipt of application from the contractor for the work in the Engineer-in-Charge.

2. Acknowledgement issued by Engineer-in-Charge His letter NO the.

3. Engineer-in-Charge remarks regarding hindrances Mentioned by the contractor.

I. Serial No.

ii. Nature of hindrances.

iii. Date of occurrence of hindrances.

iv. Period for which hindrances, is likely to last.

v. Extension of time period applied for by the contractor.

vi. Over lapping period, if any giving reference to items which over lap.

vii. Net period for which extension is recommended.

viii. Remarks as to why the hindrance occurred and justification for extension recommended.

4. Engineer-in-Charge recommendation

(The present progress of the work should be stated and whether the work is likely to be completed by the date up to which extension has been applied for. If extension of time is not recommended, what compensation is proposed to be levied under the agreement.)

SIGNATURE OF ENGINEER-IN-CHARGE

APPROVAL OF ZONAL HEAD

PROFORMA FOR EXTENSION OF TIME

P A R T – III

To

NAME

ADDRESS OF THE CONTRACTOR

SUBJECT

Dear Sir (s)

Reference your letter no. _____ date _____ in connection with the grant of extension of time for of the work ……

The date of completion for the above mentioned work, is …… as stipulated in the agreement, dated ……..

Extension of time for completion of the above mentioned work is granted up to _____ without prejudice to the right of the NPCC to recover compensation for delay compensation for delay in accordance with the provision made in clause of the said agreement dated the _____2001. I t is also clearly understood that the NPCC shall not consider any revision in contract price or any other compensation whatsoever due to grant of this extension.

Provided that notwithstanding the extension hereby granted, time is and shall still continue to be the essence not the said agreement.

Yours faithfully

FOR NPCC LTD.

PROFORMA OF BANK GURANTEE FOR
(ISD/PERFORMANCE)

NPCC Ltd.
Plot No. 67-68
Sector – 25
Faridabad – 121004

"NPCC which expression shall include its successors and assigns / supply order no dated (hereinafter called the contract) to s …….. (hereinafter called the contractor / shpplier) at a total price of Rs. ……..subject to the terms and in the contract.

WHEREAS. the terms and conditions of the contract require the contractor to furnish a bank guarantee for Rs. ……..(Rupees ……..) being ……..% of the total value of the contract for proper execution and due fulfillment of the terms and conditions contained in the contract.

We the ……..Bank, (hereafter called the "BANK") do hereby unconditionally and irrevocably undertake to pay to NPCC immediately on demand in writing and without protest / or execution / supply of and performance of the works / equipment. Inclusive of any loss, damages, charges, expenses and coats caused to or suffered by or which would be caused to or suffered by NPCC by reason of any breach by the contractor /supplier of any of the terms and conditions contained in the contract as specified in the notice of demand made by to the bank. Any such demand made by NPCC on the bank shall be conclusive evidence of the amount due and payment by the bank under this guarantee. However, the Banker's liability under this guarantee, shall be limited to Rs. …….. In the aggregate and the bank hereby agrees to the following terms and condition:-

i) This guarantee shall be continuing guarantee and irrevocable for all claims of NPCC as specified above and small be valid during the period specified above the small be valid during the during specified for the performance of the contract including the period of maintenance / warranty . i.e. up to ……..

ii) We, the said bank further agree with NPCC and NPCC shall have the fullest liberty without our consent and without affecting in any manner our obligations and liabilities hereunder to vary any of the terms and conditions of the said contract or to extend time for mance of contract by the contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by or any indulgence by NPCC to the contractor or by any such matter or thing whatsoever, which under the low relating to the sureties would, but for this provision, have effect of so relieving us.

iii) This guarantee / undertake shall be in addition to any other guarantee or security whatsoever NPCC may now or not any time have in relation to the performance of the works /equipment and the company shall have full re-course to or enforce this security in performance to any other security or guarantee which the NPCC may have obtained and there shall be no forbearance on the part of the company in or requiring enforcement of any other security which shal have the effect of the releasing Bank from its full liability. It shall not be necessary for NPCC to proceed against the said contractor / supplier before proceeding against the Bank.

iv) This guarantee / undertaking shall not be determined or affected by the liguidation or winding up, dissolution or change of constitution or insolvency of the supplier/ contractor, but shall in al respect and for all purpose be binding and operative until payment of all payable to NPCC in terms thereof are paid by the Bank.

v) The bank hereby waives all rights at any time inconsistent with the terms of this Guarantee and the obligations of the bank in terms hereof, shall not be otherwise effected on suspended by reason of any dispute or dispute having been raised by the supplier contractor (whether or not pending before any Arbitrator, Tribunal or Court) or any denial of liability by the bank to NPCC in terms thereof.

We, the said Bank lastly undertake not to revoke this rantee during its currency except with the previous consent of NPCC in writing. Unless a claim is made in writing within three months from the of expiry of this guarantee i.e. ..... we shall be relieved from all liabilities under this guarantee thereafter.

Signed .....day of .....at.....

WITNESS For and behalf of Bank.

1. _____
2. _____

GUARANTEE TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DIFFECTS AFTER COMPLETION IN RESPECT OF WATER PROFFING WORK.

The agreement made this ……day of …… Two thousand One and …….. between ……. (Hereinafter called Guarantor of the one part) and the NPCC (hereinafter called the execution agency of the other part.)

WHEREAS this agreement is supplementary to a contract hereinafter called the contract), dated…… and made between the GUARANTEE OF THE ONE part and the NPCC of the other part, whereby the contractor, inter-alia, undertook to render the buildings and the structures i the said contract recited completely water and leak proof.

AND WHEREAS the Guarantor agreed to give guarantee to effect that the said structures will remain water and leak proof for ten years from the date of handing over o the structure of water proofing treatment.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date after the maintenance period prescribe in the contract.

Provided that the guarantees will not be responsible for leakage by earthquake or structural defects of misuse of roof or and for such purpose.

a) Misuse of roof shall mean any operation, which will damage proofing treatment, like chopping of fire wood and things of the same nature which might cause damage to the roof.

b)Alternation shall mean construction of an additional storey or a part of the roof or construction adjoining to exiting roof whereby proofing treatment is removal in parts.

c) The decision of the engineer-in-charge with regard to cause of leakage shall be final.

During this period of guarantee, the guarantee shall make good all defects and incase of any defects being found render the building r proof to the satisfaction of an Engineer-in-Charge at his cost and shall remain the work for such rectification within seven days from the date of of notice from the Engineer-in-Charge calling upon him to rectify the defects failing which the work shall be got done by the NPCC by some other contractor at the guarantor's cost and risk. The decision of Engineer-in-Charge as to the cost, payable by the guarantor shall be final and binding.

That if the guarantor fails to execute the water proofing or commits breach there – under. Then the guarantee will indemnify the principle and his successors against all law damage, cost expense and otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of his supplementary agreement As to the amount of loss and / or damage and/ or cost incurred by the NPCC, the decision of the Engineer-in-Charge will final and binding of the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator …… and by …….. and for and on behalf of the NPCC on the day, month and year first above write.

Signed, sealed and delivered by obligation in the presence of-

1.

2.

Signed for and on behalf of the NPCC by ……..

In presence of

1.

2.

TABLE OF CONTENTS

PART – B – PRICE BID

A - INTERIOR WORK

1. GENERAL

In addition to the technical specifications covered in the tender under various clauses, following guidelines/ specifications shall also be considered during execution of work (rates are inclusive in terms of additional material, labour, tools, plant etc. required to follow the specifications stated below):

2. SETTING OUT

2.1 The contractor shall establish, maintain and assume responsibility for grades, lines, levels and benchmarks. He shall report any errors or inconsistencies regarding grades, lines, levels, dimensions to the Owner/PMCs before commencement of work. Commencement of work shall be regarded as the contractor's acceptance of such grades, lines, levels and dimensions and no claim shall be entertained at a later date for any errors found. If at any time, any error in this respect should appear during the progress of the work, the contractor shall, at his own expense rectify such error if so required to the satisfaction of the Owner/PMCs

2.2 Though the site levels are indicated in the drawings the contractor shall ascertained himself and confirm the site levels with respect to existing floor levels.

2.3 The approval by the Owner/PMC of the setting out by the contractor shall not relieve the contractor of any of his responsibilities.

2.4 The contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignment, the correctness of and levels of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the contractor at his own cost to the satisfaction of the Owner/PMCs. The rates quoted by the contractor in the tender shall be inclusive of site clearance, setting out work, profile, establishment of reference bench mark, spot levels, safety arrangement of all protection devices barriers, preparatory works, all testing of materials, working during monsoon, working at all depths, etc.

3. CONDITIONS FOR STACKING OF MATERIALS

All material brought at site for the work shall be stacked properly as specified in various related CPWD specifications / BIS code or as desired by the Owner/PMC.

4. WATER :

Clean fresh water from an approved source only shall be used for the work confirm to relevant clauses of IS : 3025.

5. COMPLETION DRAWINGS

After completion of works and before issuance of physical completion certificate the contractor shall submit as built completion drawings in the form of one complete set of originals on sepia cloth with tow sets of blue prints as also on the computer floppies and CD-ROM and manufacturer technical documents and warranties etc.

6. DRAWINGS AND DIMENSIONS

6.1 Drawings shall not be scaled. Figured dimensions shall be strictly followed: large-scale drawings/ details shall supersede small –scale drawings.

6.2 The contractor shall verify all dimensions and information given in the drawings for existing conditions of site.

6.3 The contractor shall be fully responsible for any error, difficulty in execution/ damage incurred owing to discrepancy in drawings, which may have been overlooked by him and has not been brought to the notice of the Owner/PMCs.

7. DAMAGE TO STRUCTURE

Any damage caused to the existing work including finished work by the contractor while executing the work shall be got rectified by the contractor at his own cost.

8. WOOD WORK

8.1 Frames where asked for shall be of specified wood and planed to obtain the required size as described in item. Sawing shall be true straight and square and in the directions of the grains and a scantling shall be accurately planed to the required dimensions before the same is fixed in position.

8.2 Joints shall be simple, neat and strong. All mortise and tenon joints, mitered joints, scarves etc. shall fit in fully accurately and without wedging or filling. The contact surfaces of all joints shall be treated with bulk type synthetic resin adhesive.

8.3 Wood shall be well seasoned and of good quality. All wood shall be uniform in texture, free from large, loose, dead or cluster knots, veins, injurious open shakes ,bore holes, rot, decay, discoloration, soft and spongy spots, hollow, pockets, pits or center heart and all other defects and blemishes.

8.4 Wood shall mean specified wood of approved quality. The wood shall have uniform color straight grained and free from knots, cracks, shakes, sapwood etc. wherever specified in nomenclature of item and drawings

9. Samples & Shop Drawings

The contractor shall before proceeding with the work, submit to the Owner/PMC complete samples of the various materials including hardware and fastening devices and shop drawings and large scale details covering all Steel & Aluminum work. The procurement works shall be carried out in accordance with the samples duly approved by Owner/PMC.

10. Rough Carpentry: Material

All framing and other concealed wood members shall be d quality of timber as shown in drawings and as per the directions of Owner/PMC. It shall be seasoned to moisture content as per provision of the I.S. codes.

11. Workmanship

Skilled workmen using proper tools shall do all Carpenters work. All joints shall be as far as possible mortised and tenoned and glued with best quality approved waterproof glue. Where mortise and tenon joints are not possible, the joints shall be securely nailed or screwed as called for with the longest nails or screws that may be used without splitting the wood. Wherever nailing of members cannot form an ad equate joint shall be lapped or joined by G.I. straps or extra wood blocks. All joints shall be done with neatness and as approved and directed by Owner/PMC. Cross bracing, solid blocking and bracing shall be provided according to the best practice. Workmanship shall generally conform to I.S. 4021

12. Joinery: Materials

13.1 Finished woodwork and joinery including frames for doors, paneling etc. shall be with straight-grained best quality teak wood unless noted otherwise, free from knots and other blemishes and imperfection. All joinery work shall be securely mortised and tenoned and glued with best quality waterproof glue. All sections and dimensions to be shown and appropriate size and woodwork screws of approved make shall be used Wherever practicable means of fastening the various parts together shall be concealed. All work (both carpentry and joinery) shall be to the dimensions shown on drawings.

13.2 All Interior/furniture wood finish, doors and cabinetwork shall be smoothly treated and sanded after erection, until all defects are entirely removed. Any works showing splits, saw sand paper or other defecting marks or other defects shall be rejected. All exposed wood and plywood shall be straight grained of matched grain and color and shall be approved by the Owner/PMC before being fabricated.

13. Installation

Doors and cabinetwork shall be installed in position after the plaster in the section for which it is intended is sufficiently dry. All Interior/furniture and exterior doors, paneling, glazing cabinetwork and other fixed wooden equivalent shall be properly installed level, plumb and true. Butt joints shall be avoided wherever possible if unavoidable the joint shall be leveled. All exterior angles shall be mitered. Adjoining Interior/furniture wood me h and harmonize.

14. Wood preservative treatment : (Anti-termite)

15.1 Wood preservative of specified quality and approved make shall be used for all woodwork done by the Contractor. Treatment shall be done after the surface is made free from dirt, dust, any foreign matter and all rough spots sand papered and cleaned. The surface must be perfectly dry before treatment is commenced. In addition to above, all portions of woodwork, joinery, timber abutting against or embedded in masonry or concrete shall be painted with boiling coal tar before being placed in position.

15.2 The rates filed in BOQ against items using wood base products shall be considered with the coating of wood preservatives as per manufacturer’s specifications & the direction of Owner/PMC.

15.3 Framing shall be as specified of required size and at required spacing as indicated in the drawings and all described specifications for any frames of paneling shall apply. The frames shall be fixed to the ceiling & floor with dash fasteners only. The frames when fixed in position shall be fairly and truly leveled.

15. Hardware

All hardware shall be of the approved quality and conforming to relevant I.S. specification. Samples of all hardware shall be got approved from the Owner/PMC before placing order for bulk procurement. Aluminum hardware where asked for shall be silver anodized aluminum with a minimum of 40 microns anodizing or as specified. All hardware shall function smoothly without any friction or crack when fixed in position. The approved samples shall be kept in the custody of Owner/PMC for checking the correctness of materials procured in comparison with approved sample.

16. Floor Spring and Pivot

Hydraulically regulated floor spring and pivot shall conform to I.S. for heavy duty performance; suitable adjustments shall be made such that the closing time can be raised five seconds to twenty five seconds. The oil filling shall work well in all seasons and shall not show any signs of leakage's of oil under working conditions. Payments shall be made per number and shall be inclusive of all accessories. Fixing the door pivot/ floor spring, anodizing / painting etc. complete as per directions of Owner/PMC.

17. Finishes

All finishing items like paints, polish shall be of the approved quality. All colours /shades or pattern of all the finishing items shall be got approved from the Owner/PMC before execution of the item. All steel members shall be painted with 2 or more coats of synthetic enamel of approved make unless specified otherwise. Necessary brushes/rollers shall be used for applying paint and polish work. All finishing works shall be executed to the satisfaction of the Owner/PMC. Finished surface shall be free from dust, specks, hair, marks, clogging of paint puddles, cement slurry marks etc. and joints where required shall be straight and form neat straight grooves where required.

18. Laminate /Teak Veneer

(a) Decorative laminated veneer sheeting shall be of the brand, catalogue, number and color indicated. The laminate shall be 1.5 mm thick on flat surfaces and 1 mm thick on curved surfaces unless otherwise approved.
(b) Laminates/ veneers shall be veneered to mounting surface with an approved adhesive used in strict accordance with the manufacturer's instructions. Rubber based adhesive shall not be used unless specified.
(c) No surface standing of laminates/ veneers will be allo .
(d) Unless otherwise specified, all veneers shall not have figures shall be light in grain and of matching sets.
(e) Sample of veneers showing the surfaces texture, shade and pattern shall be submitted for approval before fixing.

19. Storage of sheet materials

Sheet materials shall be transported and stored flat, with sufficient support to prevent bowing and warping and to prevent damage to edges and corners. Sheet materials shall be protected from weather and kept off the ground and in dry. Well – ventilated.

20. Samples

The contractor shall submit samples of all materials including samples of veneer assemblies for approval. All fabricated, delivered and assembled shall be in accordance with the approved sample.

21. Delivery and Storage – Shop fabricated items

Shop fabricated items shall be delivered to the site of the work and installed / fixed/ placed in position, and shall be properly protected whilst in transit. Installed work shall be adequately protected against soiling or damage. Damaged or soiled goods shall be replaced at the contractor's own expense and to the satisfaction of the Owner/PMC.

22. Joinery: General

23.1 Joinery shall be carried out strictly in accordance with the drawings. Where joints are not specifically indicated recognized forms of joints shall be used. Joinery shall conform to relevant IS specifications.

23.2 Where no dimensions are specified or shown on drawings the contractor shall space fixing battens, fillets, and the like in accordance with the recommendations of the manufacturer of the sheets being fixed or as approved by the Owner/PMC.

23. Carpeting Work

24.1 The carpet shall be fixed such that it is evenly stretched without any folds or slump.

24.2 Effort shall be made to put a single piece of carpet in a particular space to be carpeted. However if more than one piece is to be fixed then the direction of all the pieces used shall be similar. Prior approval of any joints shall be sought from the Owner/PMC before commencement of the work.

24.3 The edge of the carpet shall be protected either by inserting the carpet under the skirting or by providing a protection strip or cover

24. Construction and fabrication of fabric/upholstery works

25.1 The fabric shall be back faced with synthetic foam where specified. The foam shall cover all outer edges and corners and securely fixed in place to the back of the framing with approved marking cloth.

25.2 The fabric shall be evenly stretched over the foam covered framing to obtain a tight flat and evenly finished surface. The fabric shall be returned over the framing edges and lapped 50 mm over the back face of the framing and securely fixed.

25.3 Protection Generally

The contractor shall be responsible for protecting all items of work in the areas of work forming part of this contract. He shall replace at his own expense any damaged work caused through lack of adequate protection or care in installation or handling.

The contractor shall make his own investigation to guard against local sources of attack and damage and take all necessary precautions of protection.

25.4 Cabinet Work

All cabinetwork shall be assembled in the workshop or at site, as practicable and then brought inside the building ready for use. The various members shall be worked in the best manner known to the trade mortised and tenon, dowelled together and glued together and avoid the use of nails as for as possible. The details for all cabinetwork shall be approved by the Owner/PMC.

25. Paint and Polishing

26.1 All material required for the works shall be of specified and approved manufacture. Delivered to the site in the manufacturer's containers with the seals etc. unbroken and clearly marked with the manufacturer's name or trade mark with contents and color. All materials to be stored on the site to be used in the works.

26.2 Spray painting with approved machines will be permitted only if prior written approval has been obtained from Owner/PMC. Neither spraying will be permitted in the case of priming coats nor where the soiling of adjacent surface is likely to occur. The nozzle and pressure to be so operated as to give an even coating throughout to the satisfaction of Owner/PMC. The paint for spraying is to comply generally with the specification concerned, which is to be specifically prepared by the manufacturer for spraying. Thinning of paint made for brushing will not be allowed.

26.3 Wood preservation shall be solignum or other equal or approved impregnating wood preservative, and all woodwork shall be so treated.

All brushes, tools pots, kettles etc. used in carrying out the work shall be clean and free from foreign matter and thoroughly cleaned out before being used with a different type of class of material.

26.4 Surfaces of new woodwork, which are to be painted, are to be rubbed down and knotted to the approval of Owner/PMC. Melamine polishing shall be done by spray machine only to obtain the required finish. Nothing extra shall be paid for obtaining the finish.

26. Mirror and Glass

27.1 General Requirements

This section of the specification shall be read in conjunction with the drawings and schedules and other sections of the specification, which shall be deemed to be complimentary to one another. The contractor carrying out the work shall be responsible for providing all plant, tools, materials & all things necessary for the proper execution & completion of these works.

27.2 Float Glass

The Float glass will be set on EPDM Neoprene gasket located in the rebate, sealed by a specified non-setting compound to provide rebates and tolerances as specified by the manufacturer of glass shall be provided by the contractor. No damaged glass units shall be accepted and no grinding of edges shall be allowed. Owner/PMC's decision shall be final.

27.3 Samples

The contractor shall submit samples of all glass and mirror types for approval. These shall be obtained from an approved source.

27.4 Guarantees

Mirrors shall be guaranteed against loss of reflective image, trueness (silver delaminating or deterioration) for a period of three years.

27.5 Fabrication
Cutting of mirror or glass shall be in accordance with site measurements /dimensions. All edges shall be smoothened before fixing. No chipping, starring and otherwise visible imperfections around cut edges shall be accepted.

27.6 Fixing
These shall be fixed in position with EPDM Gasket or as specified.

27.7 Clearing and Completion
The contractor shall remove all marking and labels with suitable solutions after receiving directions from Owner/PMC. All installed Material and fixings shall be left in perfect condition to the satisfaction of the Owner/PMC.

27. General Instructions

28.1 The technical specifications, drawings form part of the schedule of rates. The contractor has deemed to quote on the basis of the above.
The contractor must deposit the samples/mockup of all the items intended to be used in the works for the approval of Owner/PMC, before placing order for bulk procurement. The samples shall be kept in the custody of the Owner/PMC for checking the correctness of materials procured in comparison with approved samples. All works shall be done according to designs prepared by the Owner/PMCs and the workmanship shall be to the entire satisfaction of Owner/PMC.

28.2 The Contractor shall be responsible for the temporary door shutters for closing the door openings if necessary for protection of the work during progress. He shall also provide and maintain any other temporary covering required for the protection of finish/unfinished woodwork that may be damaged during he progress of the work if left unprotected.

28.3 The contractor is required or fabricates one or more samples of each item as instructed for approval. Any minor changes in the samples to the specifications as mentioned in the tender shall not be deducted or paid extra. The bulk production can only be taken in hand after the final approval of sample each item. The sample of each item must be got approved within one week of the date of order/ commencement. It shall be the entire responsibility of the contractor to get the sample approved by the Owner/PMC in the minimum time, and no extension of time shall be granted in case of late approval of the samples.

28.4 The dimensions mentioned in drawing & specification wi e verified at site, before fabrication of any item.

28.5 All Materials, articles and workmanship shall be the respective kind for the class of work described in the schedule of quantities and specifications. All materials, so used in the different items of work shall be subject to the specifications. The word "BEST" used shall mean that in the opinion of the Owner/PMC there is no superior quality of finish of material or article available in the market in the nature of the particular item described in the schedule of quantities. The Owner/PMC shall have the power to make the contractor purchase and use such materials of particular make or from a particular source as may, in his opinion, be necessary for proper or reasonable compliance with specifications and description of the different items of work.

28.6 Only approved hangers, dash fasteners, bolts, screws and other metal fixing devices shall be used to secure frames, panels and other units in position. Holes shall be formed with electrical drills, Structural members shall not be cut or chiseled without prior consent of the Owner/PMC.

B) HVAC WORK :

System Design Data

1. General :
The system design, basis of design, estimated requirements and other relevant data are outlined in this section. The detailed specifications and specific requirements are outlined in the subsequent sections.

2. Location :
The proposed Air-conditioning work is to be carried out for ICMR Conference Hall at New Delhi.

3. Scope of Work
3.1 The work proposed under this tender includes providing and fixing, airconditioning systems for entire area of the building.

3.2 Providing and fixing at site all main equipments associated with A.C. system asked under these technical specifications.

3.3 To execute all incidental work at site including material supply at site associated with A.C. asked in the technical specifications. Nature of such will be sheet metal duct/grill work., refrigerant piping and drain etc. foundation of equipments, making opening in walls and slabs and making them good, incidental electrical Engineering work, control panels etc. erection work at site for all manufactured items at work and also items fabricated at site.

3.4 Routine testing, pressure testing of fabricated components, commissioning of complete system at site.

3.5 Performance testing of complete air-conditioning system at site as per various technical requirements as stipulated in performance testing clause.

4. Basis of Design :

4.1	Out side conditions	Summer :	43.3^{O} CDB; 23.9 ^{O} CWB
		Monsoon :	35.0^{O} CDB; 28.3 ^{O} CWB
		Winter :	7.2^{O} CDB; 5.0^{O} CWB
4.2	Inside conditions	Summer :	23.8^{O} CDB +/- 1^{O} C
		& Monsoon :	RH Not Exceeding 65%
4.3	Lighting load	:	2 watt per sqft.
4.4	Occupancy	:	As per layout
4.5	Fresh air	:	10 cfm per person

5. Estimated Requirement :

Based on above design data, the estimated requirements are as follows.

S.No.	Name of Area	Area	Cooling Requirement Unit		Proposed
			Summer	Monsoon	
		(Sqft.)	Tons	Tons	Tons
1	CONFERENCE HALL	1672	15.02	15.47	6 x 3.0 TR Cassette Split Unit
	TOTAL:	1672	15.02	15.47	

6. System Design :

6.1 It is proposed to install split type air conditioners for the above areas.

6.2 A combination of Cassette split units shall be installed for air-conditioning the above areas.

6.3 Outdoor unit of each unit shall be located on terrace hall be carried out upto each indoor units.

6.4 Fresh air shall be provided by heat recovery ventilation system to maintain air quality.

7. Drawings :

The drawings forming part of these specifications provide a feasible scheme for locating the equipment. The contractor may re-arrange the equipment for improving the layout and g the site conditions. These drawings are meant to be working drawing which shall be prepared by the con ed.

8. Test data :

The plant whole system shall be tested as per specifications given elsewhere and complete test data shall be furnished on prescribed data sheet.

9. Deviation from Specifications :

Deviation from specifications may be accepted, provided such deviations are found necessary and appropriate, in order to conform to the design of established foreign collaborators.

10. Technical Data :

The contractor shall furnish complete "technical data" on the equipment offered by m as required under the heading "Technical Data".

11. Performance Guarantee :

11.1 The contractor shall guarantee that the air-conditioning system shall maintain the designed inside temperature within +/-1°c tolerance and the relative humidity shall not exceed the specified limit.

11.2 The contractor shall guarantee that the capacity of various components as well as the whole system shall not be less than specified.

11.3 The contractor shall ensure, that the system shall be free of vibrations and disturbing sounds.

Split System Air conditioners

1. General :

The contractor shall supply and install split system air conditioners wherever indicated. The system shall be complete in all respects and comply with the specifications as given.

2. Condensing Units :

2.1 Each condensing unit shall be complete unit with hermetic reciprocating/scroll compressor/s, air-cooled condenser, fans with motors, internal piping, switches and internal wiring and shall be enclosed in a weather proof outdoor type housing.

2.2 The compressor shall be hermetic, with enclosed gas cooled motor. The compressor's shall be suitable for R410a / R407c.

2.3 The condenser coil shall be air cooled type with aluminum fins and copper tubes and necessary refrigerant connections. The copper tubes shall not be less than 1/2" O.D.

2.4 The condenser air fans shall be propeller type direct driven, each complete with motor. The air quantity and area of condenser shall be adequate for working in the specified outdoor conditions.

2.5 The casing shall be fabricated from galvanized steel, zinc phosphated and finished with baked enamel paint. The casing shall make the whole unit fully weather proof, suitable for outdoor installation.

2.6 The unit shall include a remote control assembly with thermostat and speed switches.

2.7 The necessary charge of refrigerant gas and lubricated oil shall be provided to run the system.

3. Indoor Units

General :
The indoor units shall be complete in all respects and shall generally with the specifications as given in the following paragraphs.

3.1 Cassette Units :

Unit
The units shall be Cassette type. The housing of the unit shall be powder coated galvanized steel and shall include filter, fan section, coil section, etc. The body shall be light in weight.

The fan shall be Aerodynamically designed diffuser turbo fan type. The fan shall be mounted directly on motor shaft having supported from housing. The fan shaft shall be statically and dynamically balanced. The fan shall be direct driven type.

The cooling coil shall be of seamless copper tubes, and shall have continuous aluminium fins. The fins shall be spaced by collars forming integral part of the fins. The tubes shall be staggered in the direction of air flow. The fins shall be uniformly bonded to the tubes by mechanical expansion of the tubes. The coils shall be tested against leaks.
Unit shall have filter cleanable type of resin net (with mold resistant) fixed to an integrally molded plastic frame. The filter should be slid away type but neatly inserted.

Unit shall have a external attractive casing for supply and return air. Unit shall have two/four way supply air grilles and return air grille in centre. 50

Control :
Each unit shall be with corded remote controller to operate maintain inside conditions.

Testing :
The indoor unit shall be tested to measure air quantity and coil performance by measuring temperature difference and calculating the capacity.

4. Refrigerant Piping :

4.1 The condensing unit and evaporator unit shall be interconnected by type `L' seamless copper refrigerant liquid and suction lines using flared or brazed fittings. Necessary accessories shall be incorporated in the circuit.

4.2 The suction line shall be insulated with two layers of 6 mm rubber foam insulation.

5. Miscellaneous :

5.1 The unit shall have control panel, housing the starting switches, contactor, relays etc.

5.2 Isolation pads shall be provided under the units.

5.3 Drain line shall be provided from fan coil unit Upto drain trap. (To be priced separately).

5.4 Ductable unit shall have canvass connection at its outlet. The canvass connection shall be fire retardant, double layer.

5.5 Suitable M.S. angle iron supporting frame shall be provided for the condensing unit and supporting arrangement for indoor units.

5.6 Interconnecting power and control cabling shall be provided between condensing unit and evaporator unit.

Heat Reclaim Ventilation

1. General :

The heat recovery ventilation shall be complete in all respects and shall generally comply with the specifications given in the following paragraphs.

2. Heat Reclaim Ventilation Unit

2.1 The heat recovery ventilation shall consist of 2 independent sections for extracting heat from the return air and for cooling the outside air.

2.2 Each section will be complete with centrifugal forward curved fan, motor and drive, air filters and HRV.
In order to achieve the purpose of better indoor air quality, the Heat Reclaim ventilation (HRV) unit must exchange the supplied fresh air and exhausted air in order to bring the outside air closer to indoor temperature and humidity conditions. Thus it must recover the thermal energy of exhaust air and reuse it for supplied fresh air. This must ventilation without increasing the load and the running cost.
It shall be possible to interlock this HRV system with operation of our system to simplify installation and improving the air-conditioning. It shall be possible to set automatic ventilation mode so that heat exchange mode and ventilation mode can be automatically selected to enhay conservation.

The casing of the HRV unit shall be made of galvanized steel plate, insulation with self extinguishable polyurethane foam. The unit must be provided double insulated weather proof casing for outdoor installation. The casing shall be such type with inner and outer 0.6 mm thick precoated GSS, fixed in a hollow Aluminum section with thermal break. The unit must have air filters of multi directional fibrous fleeces type.

The heat exchanger element must be designed without any moving parts for higher durability and reliability, It should have high permeability high efficiency specially processed paper which is flame retardant and fungi proof to keep air clean.

The unit must be provided with built in multidirectional fibrous filter.

The Unit must have optimized design of fan and air flow passage to make it compact and supply air & exhaust air passage must be arranged in such pattern so as to prevent mixing of supply (fresh) and exhaust air.
The unit must be suitable for single phase power supply and have their control panel.

3. Accessories :

3.1.1 The following accessories shall be provided as part of the HRV price.

3.1.2 Flexible fire proof double canvass connection between utlet and duct.

3.1.3 Vibration isolators of 90% efficiency.

4. Testing :
The heat recovery ventilation unit shall be tested to measure air quantity and heat transfer efficiency by measuring temperature difference, then calculating capacity by using the above measurements.

C : ELECTRICAL WORK

INTERNAL ELECTRICAL WORKS

GENERAL

1.1 The electrical Installation works (Internal Electrical Works) shall be carried out in accordance with Indian Standard Code of Practice for Electrical Wiring Installation IS: 732-1989 and IS: 2274-1963. Electrical Installation work shall also be in conformity with National Electrical Code with Upto date amendments. All Electrical work shall be carried out in accordance with the provision of Indian Electricity Act 1910 & Indian Electricity Rules 1956 upto date. The work shall also conform to Indian Standard Code of Practice for the type of work involved. It shall also be in conformity with regulations and requirements of the Local Electricity Supply Authority and Fire Insurance regulations so far as these become applicable to the installation. Electrical work shall be carried out as per following General Specifications for Electrical Works.

Part I - Internal Work - 2005.

Part II - External Work - 1994.

Wherever this Tender Specifications call for a higher standard of material and or workmanship than those required by any of the above mentioned regulations and specifications then the particular specifications given here under shall take precedence over the said regulations and standards.

1.2 The work shall be executed and measured as per the dimensions given in the Bill of Quantities. Drawings, Specifications etc. The abbreviations used shall mean as under :-

//	-	Inch (25.4mm)
/	-	Foot (12 inches or 30.48 cms)
Sq.Ft.	-	Square Feet
Sq.Mt (M^2)	-	Square Meter.
Cu. Ft.	-	Cubic Feet.
Cum (M^3)	-	Cubic Meter.
Kg.	-	Kilograms (Equivalent to 1000 gms)
T.(M.T.)	-	Tonne (Equivalent to 1000 Kgs.)
No.	-	Numbers.
Cm.	-	Centimeter.
M or R.M.	-	Meter or Running Meter.

2.0 SUB DISTRIBUTION BOARDS & DISTRIBUTUION BOARDS.

2.1 SUB DISTRIBUTION BOARD

Sub distribution boards shall be indoor type, metal clad, floor mounted, compartmentalized, free standing, totally enclosed, air insulated, cubicle type for use on 415 Volts, 3 phase, 50 cycles system.

2.1.1 Standards

The equipment shall be designed to conform to the requirements of :

IS:8623- Factory Built Assemblies of switchgear and control gear.

IS:4237- General requirements for switchgear and control gear for voltages not exceeding 1000 volts.

IS:2147- Degree of protection provided by enclosures for low voltage switchgear and control gear.

IS:375- Marking and arrangement of bus bars.

Individual equipment housed in the Sub Distribution Board shall conform to the following IS Specification.

Moulded case circuit breaker IS:2516 (Part-I&II/Sec-I)-1977 & IS:13947-Part2-1993.

HRC Fuse links – IS : 9224 – 1979 & IS : 13947-Part4- 1993.

Current Transformers - IS : 2705

Voltage Transformers - IS : 3156

Indicating Instruments - IS : 1248

Control switches & Push Buttons - IS : 6875

2.1.2 Construction.

Sub Distribution Board shall be :-

Of metal enclosed, indoor, floor mounted, free standin truction.

Made up of the requisite vertical sections, which when coupled together shall form continuous dead front switchboards.

Provide dust and damp protection, the degree of protection shall be IP:54 conforming to IS:2147.

Sub distribution shall be constructed only of materials capable of withstanding the mechanical, electrical and thermal stresses, as the effects of humidity, which are likely to be encountered in normal service.

Each vertical section shall comprise of :

i. A front-framed structure of rolled/folded sheet steel channel section, of minimum 2 mm thickness, rigidly bolted together. This structure shall house the components contributing to the major weight of the equipment, such as circuit breaker, main horizontal bus bars, vertical risers and other front mounted accessories.

   The structure shall be mounted on a rigid base frame of folded sheet steel of minimum 2 mm thickness and 100 mm height or 100 x 50 x 50mm MS Channel. The design shall ensure that the weight of the components is adequately supported without deformation or loss of al ment during transit or during operation.

ii. A side cable chamber housing the cable end connections, and power/control cable terminations. The design shall ensure generous availability of space for ease of installation and maintenance of cabling, and adequate safety for working in one vertical section without coming into accidental contact with live parts in an adjacent section.

iii. A cover plate at the top of the vertical section, provided with a ventilating hood where necessary. Any aperture for ventilation shall be covered with a perforated sheet having less than 1 mm diameter perforations to prevent entry of vermin.

iv. Front and rear doors fitted with dust excluding neoprene gaskets with fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors, generous overlap shall be assured between sheet steel surfaces with closely spaced fasteners to preclude the entry of dust.

The height of the panels should not be more than 2000m /handle etc. of highest unit shall not be more than 1800mm and not lower than 300mm. The total depth of the panel should be adequate to cater to proper cabling space and should not be less than 400mm.

Doors and covers shall be of minimum 2mm thick sheet steel. Sheet steel shrouds and partitions shall be of minimum 1.63mm thickness. All sheet panels shall be smoothly finished, leveled and free from flaws. The corners should be rounded. The apparatus and circuits in the power control centers shall be so arranged as to facilitate their operation and maintenance and at the same time to ensure the necessary degree of safety.

Apparatus forming part of the Sub Distribution Boards shall have the following minimum clearances.

i. Between phases - 32 mm

ii. Between phases and neutral - 26 mm

iii. Between phases and earth - 26 mm

iv. Between neutral and earth - 26 mm

Creep age distances shall comply to those specified in relevant standards.

All insulating material used in the construction of the equipment shall be of non-hygroscopic material, duly treated to withstand the effects of the high humidity, high temperature tropical ambient service conditions.

Functional units such as circuit breakers shall be arranged in multi-tier formation. Cable entry for various feeders shall be from the front through cable alley located in between two circuit sections or from the back of the switches. All cables entries shall be through glands plates. There shall be separate gland plate for each cable entry so that there will not be dislocation of already wired circuit when new feeders are added. Gland plate shall be 3 mm thick.

Metallic perforated barriers shall be provided within vertical sections and between adjacent sections to ensure prevention of accidental contact with:

i. Main bus bars and vertical risers during operation, inspection or maintenance of functional units and front mounted accessories.

ii. Cable termination of one functional unit, when working on those of adjacent unit/units.

All doors/covers providing access to live power equipment/ circuits shall be provided with tool operated fasteners to prevent un-authorized access.

Provision shall also be made for permanently earthing the frames and other metal parts of the switchgear by two independent connections.

2.1.3 Metal Treatment & Finish.

All steel work used in the construction of the Sub Distribution Boards should have undergone a rigorous metal treatment process as follows:-

Effective cleaning by hot alkaline degreasing solution followed by cold water rinsing to remove traces of alkaline solution.

Pickling in dilute sulphuric acid to remove oxide scal rust formation, if any, followed by cold water rinsing to remove traces of acidic solution.

A recognized phosphate process to facilitate durable coating of the paint on the metal surfaces and also to prevent the rusting in the event of the paint film being mechanically damaged. This again, shall be followed by hot water rinsing to remove traces of phosphate solution.

Passivating in de-oxalite solution to retain and augment the effects of phosphating.

Drying with compressed air in a dust free atmosphere.

A finishing coat of Powder coating of Siemens gray color.

2.1.4 Bus bars

The bus bars shall be air insulated and made of high conductivity, high strength aluminum alloy complying with the requirement of grade E-9IE of IS-5082.

The bus bars shall be suitable braced with non-hygroscopic SMC supports to provide a through fault withstand capacity of 50KA RMS symmetrical for one second and a peak short circuit withstand capacity of 105KA. The neutral as well as earth bar should be capable of withstanding the above level. Ridges shall be provided on the SMC supports to prevent tracking between adjacent bus bars. Large clearances and creepage distances shall be provided on the bus bar system to minimize possibilities of fault.

The Main & Sub Distribution Boards shall be designed that the cables are not directly terminated on the breaker/switch fuse/fuse switch etc. but on cable termination links. Capacity of aluminum bus bars shall be considered as 0.8A/sq.mm of cross section area of the bus bar. The main bus bars shall have continuous current rating throughout the

length of L.T. Panel. The cross section of neutral bus bars shall be same as that of phase bus bar for bus bars of Upto 200Amp; for higher capacity the neutral bus bar shall not be less than half (50%) the cross section of that the phase. The bus bar system shall consists of main horizontal bus bar and auxiliary vertical bus bars run in bus alley/chamber on either side in which the circuit could be arranged/connected with front access.

Connections from the main bus bars to functional circuit shall be arranged and supported to withstand without damage or deformation the thermal and dynamic stresses due to short circuit currents. Bus bars to be color coded with PVC sleeves.

2.1.5 MOULDED CASE CIRCUIT BREAKERS.

2.1.5.1 GENERAL

Moulded Case Circuit Breaker shall be incorporated in the Sub Distribution Boards wherever specified. MCCB's shall conform to IS : 13947 (Part-II) IEC-947(2) in all respects. MCCB's shall be suitable either for single phase AC 230 volts or there phase 415volts. All MCCB shall be have microprocessor release for O/L, S/C & E/F protection.

2.1.5.2 FRAME SIZES

The MCCB's shall have the following frame sizes subject to meeting the fault level as specified elsewhere.

a. Up to 100 Amp rating	...	100 Amp frame.
b. Above 100 Amp to 250 Amp	...	250 Amp frame.
c. Above 250 Amp to 400 Amp	...	400 Amp frame.
d. Above 400 Amp to 630 Amp	...	630 Amp frame.

2.1.5.3 CONSTRUCTIONS

The MCCB's cover and case shall be made of high strength heat treatment and flame retardant thermo-setting insulating material. Operating handle shall be quick make/quick break, trip-free type. The operating handle shall have suitable "ON", "OFF" "and" "tripped" indicators. Three phase MCCB's shall have common operating handle for simultaneous operation and tripping of all the three phases. Rotary type operating Handle shall be provided. MCCB shall be load/line reversible type. MCCB shall be site adjustable type with overload setting of 80% to 100%. Suitable extinguishing device shall be provided for each contact. MCCB shall be current limiting type.

Contacts trips shall be made of suitable air resistant, silver alloy for long electrical life. Terminals shall be of ideal design with adequate clearance.

2.1.5.4 RUPTURING CAPACITY

The Moulded Case Circuit Breaker shall have a service rupturing capacity not less than 25 KA RMS at 415 volts for Sub Distribution Boards.

2.1.5.5 TESTING

Routine & Type Test certificate of the MCCB as per relevant Indian Standards (IS) shall be submitted.

2.1.6 MINIATURE CIRCUIT BREAKER

The MCB's shall be of the completely moulded design suitable for operation at 240/415 Volts 50 Hz system.
The MCB's shall have a rupturing capacity of 10 KA.
The MCB's shall have inverse time delayed thermal overload and instantaneous magnetic short circuit protection.
Type test certificates from independent authorities shall be furnished.

2.1.7 MEASURING INSTRUMENTS, METERING & PROTECTION

2.1.7.1 GENERAL

Direct reading electrical instruments shall be in conformity with IS-1248. The accuracy of direct reading shall be 1.0 for voltmeter and 1.5 for ammeters. Other type of instruments shall have accuracy of 1.5. The errors due to variations in temperature shall be limited to a minimum. The meter shall be suitable for continuous operation between-10 Centigrade to + 50 degree Centigrade. All meters shall be of flush mounting type of 96mm square pattern. The meters shall be enclosed in a dust tight housing. The housing shall be of steel or phenolic mould. The design and manufacture of the meters shall ensure the prevention of fogging of instruments glass. Instruments meters shall be sealed in such a way that access to the measuring element and to the accessories within the case shall not be possible without removal of the seal.

The specifications herein after laid down shall also cover all the meters, instrument and protective devices required for the electrical work. The ratings type and quantity of meters, instruments and protective devices shall be as per the schedule of quantities.

2.1.7.2 DIGITAL AMMETERS.

Ammeters shall be digital type 7 segments LED display. Ammeter shall be suitable for accuracy class 1.0 and burden 0.5 VA approx. The ammeters shall be capable of carrying sustained overloads during fault conditions without damage or loss of accuracy.

2.1.7.3 DIGTIAL VOLTMETERS.

Voltmeter shall be digital type 7 segments LED display. Voltmeter shall be suitable for accuracy class 1.0 and burden 0.5 VA approx. The range for 3 phase voltmeters shall be 0 to 500 volts. The voltmeter shall be provided with protection fuse of suitable capacity.

2.1.7.4 CURRENT TRANSFORMERS.

Current transformers shall be in conformity with IS: 2705 (part I,II & III) in all respects. All current transformers used in medium voltage applications shall be rated for 1kv. Current transformers shall have rated primary current, burden and class of accuracy as required. However, the rated secondary current shall be 5A unless otherwise specified. The acceptable minimum class of various applications shall be as given below:

Measuring : Class 0.5 to 1.

Protection : Class 5P10.

Current transformers shall be capable of withstanding without damage, magnetic and thermal stresses due to short circuit fault of the system. Terminals of the current transformers shall be marked permanently for easy identification. Separate CT shall be provided for measuring instruments and protection relays. Each C.T. shall be provided with rating plate.

Current transformers shall be mounted such that they are easily accessible for inspection, maintenance and replacement. The wiring for CT's shall be copper conductor, PVC insulated wires with proper termination lugs and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

2.1.8 MISCELLANEOUS

Control switches shall be of the heavy-duty rotary type with escutcheon plates clearly marked to show the operating positions. They shall be semi-flush mounting with only the front plate and operating handle projecting. Indicating lamps shall be LED and shall be easily replaced from the front.

Push buttons shall be of the momentary contact, push to actuate type fitted with self-reset contacts & provided with integral escutcheon plates marked with its functions.

2.1.9 CABLE TERMINATIONS

Cable entries and terminals shall be provided in the Switchboard for the number, type and size of aluminum conductor power cables and copper conductor control cable specified.

Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided, with the position of cable gland and terminals such that cables can be easily and safely terminated.

Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

Cable risers shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

2.1.10 LABELS

Labels shall be anodized aluminum with white engraving on black background shall be provided for each incoming and outgoing feeder of Sub Distribution Boards. Labels shall be properly secured with fasteners.

2.1.11 TESTING AND COMMISSIONING

Commissioning checks and tests shall be included all wiring checks and checking up of connections. Primary/secondary injection tests for the relays adjustment/setting shall be done before commissioning in addition megger test. Checks and tests shall include the following.

a) Operation checks and lubrication of all moving parts.

b) Interlocking function check.

c) Continuity checks of wires, fuses etc. as required.

d) Insulation test : Testing shall be as per CPWD specification.

e) Trip tests & protection gear test.

2.2 DISTRIBUTION BOARDS

Distribution Board shall be double door type with exte ire box at the top and suitable for flush installation. All distribution boards shall be of three phase (415 Volts) or single phase (240 volts) type with incoming isolator MCB and/or ELCB as in Schedule of Quantities. Distribution boards shall contain plug in or bolted type miniature circuit breaker mounted on bus bars. Miniature circuit breakers shall be quick make & quick break type with trip free mechanism. MCB shall have thermal & magnetic short circuit protection. MCB shall conform with IS 8828-1978. Bus bars shall be of electrolytic copper. Neutral bus bars shall be provided with the same number of terminals, as single pole ways on the board, in addition to the terminals for incoming mains. An earth bar of similar size as the neutral bar shall also be provided. Phase barrier shall be fitted and all live parts shall be screened from the front. Ample clearance shall be provided between all live metal and the earth case and adequate space for all incoming and outgoing cables. All distribution board enclosures shall have powder coated painting after metal treatment as listed in clause No. 13. A Circuit identification card in clear plastic cover shall be provided for each distribution board.

Distribution Board with single-phase outgoings requirement shall be Horizontal type. Distribution Board with three phase outgoings requirement shall be Vertical type. Distribution Board installed in indoor dry locations shall conform to IP-54. Distribution Board installed in outdoor & wet locations shall conform to IP- 65.

Miniature Circuit Breakers for lighting circuits shall be of "B" series where as the circuits feeding discharge lamps (HPMV or HPSV) halogen lamps, all power outlet points, equipment/ machinery shall be of "C" series (Motor type circuit)All miniature circuit breakers shall be of 10 KA rated rupturing capacity.

Distribution board shall be provided with isolator or MCB and/or earth leakage circuit breaker as mentioned in drawings and BOQ. Earth leakage circuit breaker shall be current operated type and of sensitivity not less than 30mA unless otherwise stated. ELCB shall be mounted within distribution board box. Distribution board box, Isolator, MCB's used shall be of one/same manufacturer. Standard size DB Box manufactured by approved manufacturer shall be used. In case size specified in BOQ is not standard size of manufacturer, in that case next standard size distribution box shall be used with incoming & outgoing MCB as specified in BOQ. Additional cutout/space for MCB's shall be plugged with blank plates.

3.0 L.T. CABLES

3.1 GENERAL

L.T. Cables shall be supplied, inspected, laid tested and commissioned in accordance with drawings, relevant Indian Standards specifications and cable man facturer's instructions. The cable shall be delivered at site in original drums with manufacturer's name clearly written on the drums. The recommendations of the cable manufacturer with regard to jointing and sealing shall be strictly followed.

3.2 MATERIALS

The L.T. Power cables shall be XLPE insulated PVC sheathed type aluminum conductor armored cable conforming to IS 7098 - 1988 (Part-I) with Upto date amendments where as control cable shall be PVC insulated and PVC sheathed copper conductor armored / unarmored cable conforming to IS:1554 (Part-I).

3.3 INSTALLATION OF CABLES

Cables shall be laid directly in ground, pipes, masonry ducts, on cable tray, surface of wall/ceiling etc. as indicated on drawings and / or as per the direction of Engineer-In-Charge. Cable laying shall be carried out as per CPWD specifications.

3.4 INSPECTION

All cables shall be inspected at site and checked for any damage during transit.

3.5 JOINTS IN CABLES

The Contractor shall take care to see that the cables received at site are apportioned to various locations in such a manner as to ensure maximum utilization and avoiding of cable joints. This apportioning shall be got approved from the Engineer-In-Charge before the cables are cut to lengths.

3.6 LAYING CABLES IN GROUND

Cables shall be laid by skilled experienced workmen using adequate rollers to minimize stretching of the cables. The cable drums shall be placed on jacks before unwinding the cable. With great care it shall be unrolled on over rollers and laid in trenches at intervals not exceeding 2 meters. Cables shall be laid at depth of 0.75 meters below ground level. A cushion of sand total of 250mm shall be provided both above and below the cable, joint boxes and other accessories. Cable shall not be laid in the same trench as water main.

The cable shall be laid in excavated trench over 80mm layer of sand cushion. The relative position of the cables, laid in the same trench shall preserve. At all changes in direction in horizontal and vertical planes, the cables shall be bent smooth with a radius of bent not less than 12 times the diameter of cables. Minimum 3 meter long loop shall be provided at both end of cable.

Distinguishing marks may be made on the cable ends for identifications of phases. Insulation tapes of appropriate voltage and in red, yellow and blue colors shall be wrapped just below the sockets for phase identifications.

3.7 PROTECTION OF CABLES

The cables shall be protected by bricks laid on the top layer of the sand for the full length of underground cable. Where more than one cable is laid in the same trench, the bricks shall cover all the cables and shall project a minimum of approximately 80mm on either side of the cables. Cable under road crossings and any other places subject to heavy traffic shall be protected by running them through Hume Pipes of suitable size.

3.8 EXCAVATION & BACK FILL

All excavation and back fill required for the installation of the cables shall be carried out by the Contractor in accordance with the drawings and requirements laid down elsewhere. Trenches shall be dug true to line and grades. Back fill for trenches shall be filled in layer not exceeding 150mm. Each layer shall be properly rammed and consolidated before laying the next layer.

The Contractor shall restore all surface, roadways, side walks, kerbs wall or the works cut by excavation to their original condition to the satisfaction of the Engineer-In-Charge.

3.9 LAYING OF CABLES ON CABLE TRAY / SURFACE OF WALL/CEILING

Cable shall be laid on perforated M.S. Cable tray. Cables shall be properly dressed before cable ties/clamps are fixed. Wherever cable tray is not proposed, cables shall be fixed on surface of wall or ceiling slab by suitable MS saddles / clamps. Care shall be taken to avoid crossing of cable.

3.10 CABLES ON HANGERS OR RACKS

The Contractor shall provide and install all iron hangers racks or racks with die cast cleats with all fixings, rag bolts or girder clamps or other specialist fixing as required.

Where hangers or racks are to be fixed to wall sides, ceiling and other concrete structures, the Contractor shall be responsible for cutting away, fixing and grouting in rag bolts and making good.

The hangers or racks shall be designed to leave at least 25mm clearance between the cables and the face to which fixed. Multiple hangers shall have two or more fixing holes. All cables shall be saddled at not more than 150mm centers. These shall be designed to keep provision of some spare capacity for future development.

3.11 CABLES TAGS

Cable tags shall be made out of 2mm thick aluminum sheets, each tag 1-1/2 inch in dia with one hole of 2.5mm dia, 6mm below the periphery. Cable designations are to be punched with letter/number punches and the tags are to be tied inside the panels beyond the glanding as well as below the glands at cable entries. Trays tags are to be tied at all bends. On straight lengths, tags shall be provided at every 5 meters.

3.12 TESTING OF CABLES

Prior to installation, burying of cables, following tests shall be carried out. Insulation test between phases, phase & neutral, phase & earth for each length of cable.

a. Before laying.

b. After laying.

c. After jointing.

On completion of cable laying work, the following tests shall be conducted in the presence of the Engineer-In-Charge.

a. Insulation Resistance Test (Sectional and overall).

b. Continuity Resistance Test.

c. Earth Test.

All tests shall be carried out in accordance with relevant I tandard code of practice and Indian Electricity Rules. The Contractor shall provide necessary instruments, equipments and labour for conducting the above tests & shall bear all expenses of conducting such tests.

4.0 CABLE TRAY

4.1 Perforated Type Cable Tray

4.1.1 The cable tray shall be fabricated out of slotted/perforated MS sheets as channel sections, single or double bended channel. The sections shall be supplied in convenient lengths and assembled at site to the desired lengths. These may be galvanized or painted as specified.

4.1.2 Typically, the dimensions, fabrication details etc. ar D General Specification for Electrical Works Part-IV-External.

4.1.3 The jointing between the sections shall be made with coupler plates of the same material and thickness as the channel. Two coupler plates, each of minimum 200mm length, shall be bolted on each of the two sides of the channel with 8mm dia round headed bolts, nuts and washers. In order to maintain proper earth continuity bond, the paint on the contact surface between the coupler plates and cable tray shall be scraped and removed before the installation.

4.1.4 The maximum permissible uniformly distributed load for various sizes of cable trays and for different supported spans are as per Table-IV. The sizes shall be specified considering the same.

4.1.5 Factory fabricated bends, reducers, tee/cross junctions, etc. shall be provided as per good engineering practice. (Details typically shown in figure-3) of CPWD General specifications of Electrical Work Part-II – 1994. The radius of bends, junctions etc. shall not be less than the minimum permissible radius of bending of the largest size of cable to be carried by the cable tray.

4.1.6 The entire tray (except in the case of galvanized type) and the suspenders shall be painted with two coats of red oxide primer paint after removing the dirt and rust, and finished with two coats of spray paint of approved make synthetic enamel paint.

4.2 Ladder Type Cable Tray

Ladder type cable tray shall be fabricated out of double bended channel section longitudinal members with single bended channel section rungs of cross members welded to the base of the longitudinal members at a centre to centre spacing of 250mm. The channel sections shall be supplied in convenient lengths and assembled at side to the desired lengths. These may be galvanized or painted to the desired lengths. Alternatively, where specified, the cable tray may be fabricated by two angles of 50mm x 50mm x 6mm as two longitudinal members, with crosses bracings between them by 50mm flats welded/bolted to the angles at 1 m spacing.

4.2.1 Typically, the dimensions, fabrication details etc. are shown in CPWD General Specification for Electrical Works Part II -External, 1994.

The jointing between the sections shall be made with coupler plates of the same material and thickness as the channel section. Two coupler plates, each of minimum 200mm length, shall be bolted on each of the two sides of the channel section with 8mm dia round headed bolts, nuts and washers. In order to maintain proper earth continuity bond, the paint on the contact surfaces between the coupler plates and cable tray shall be scraped and removed before the installation.

4.2.2 The maximum permissible uniformly distributed load for various sizes of cables trays and for different supported spans as per CPWD General Specification of Electrical Work Part II -1994. The sizes shall be specified considering the same.

4.2.3 The width of the cable tray shall be chosen so as to accommodate all the cable in one tier, plus 30 to 50% additional for future expansion. This additional width shall be minimum 100mm. The overall width of one cable tray shall not exceed 900mm.

4.2.4 Factory fabricated bends, reducers, tee/cross junctions, etc. shall be provided as per good engineering practice. (Details typically shown in figure 3 of CPWD General Specification of Electrical Work Part-II-1994. The radius of bends, junctions etc. shall not be less than the minimum permissible radius of bending of the largest size of cable to be carried by the cable tray.

4.2.5 The entire tray (except in the case of galvanized type) and the suspenders shall be painted with two coats of red oxide primer paint after removing the dirt and rust, and finished with two coats of spray paint of approved make synthetic enamel paint.

The cable tray shall be bonded to the earth Terminal of the switch bonds at both ends.

4.2.6 The cable trays shall be measured on unit length basis, along the center line of the cable tray, including bends, reducers, cross joints, etc, and paid for accordingly.

4.3 The cable tray shall be suspended from the ceiling slab with the help of 10mm dia MS rounds or 25mm x 5mm flats at specified spacing as per of CPWD General Specification of Electrical Work Part II -1994. Flat type suspenders may be used for channels Upto 450mm width bolted to cable trays. Round suspenders shall be threaded and bolted to the cable tray or to independent support angles 50mm x 50mm x 5 mm at the bottom end as specified. These shall be grouted to the ceiling slab at the other end through an effective means, as approved by the Engineer, to take the weight of the cable and the cables.

5.0 CONDUITING & WIRING

5.1 General

Conduit & wiring of light points, fan points, call bell points, light plug points & general purpose power plug point, power points for geyser etc. shall in general shall be carried out in concealed/ recess system with PVC Conduit & accessories. Conducting work shall be carried out on surface above false ceiling & recess in wall / partition below false ceiling. Sub mains from Sub Distribution Boards Upto each distribution board shall be in PVC Conduit. In the Electrical shaft conduits shall be fixed on surface with special purpose made fixing brackets / saddles etc. with Junction box fixed on entire width of

Electrical shaft to facilitate wiring pulling & for future maintenance. Junction box shall be provided at each floor level and shall have suitable junction box cover.

Wiring of light circuit (namely light point, fan point, call bell point & light plug point) shall be in separate conduit than wiring for power points, telephone points & data outlet points.

Separate conducting shall be provided for lighting point, power points, telephone points. Low voltage conduits shall in general kept away from electrical wiring conduits and a minimum distance of 300mm shall maintained from electrical conduits.

5.2 PVC CONDUIT

Conduits shall be heavy gauge rigid PVC of minimum thickness of 2mm. Conduits shall be ISI marked confirming to IS : 9537 (Part-3)-1983. All conduit and conduit accessories shall be of PVC. Conduits shall be joined together by a suitable size of PVC cement / solvents. Minimum size of conduit shall be 25mm dia. Conduit shall be fixed on ceiling or wall. All conduits shall be concealed in wall ceiling etc. or fixed on surface of wall with clamps at regular interval as called for elsewhere. For termination of PVC conduits into switch outlet boxes, PVC female adopters shall be used. Wherever the run exceeds 10 meter, circular junction boxes shall be provided to facilitate pulling & inspection of wires. Inspection boxes shall be suitably located in co-ordination with the Engineer-in-charge. Conduits shall be bent using suitable size springs. Long radius bends shall be provided. Heating shall not be used to bend the conduits. Size of conduit shall depend upon number and size of wires to be drawn.

5.3 FIXING OF CONDUITS

a) SURFACE CONDUIT

Conduit pipes shall be fixed by heavy gauge saddles, secured to suitable wood plugs or other approved plugs with screws in an approved manner at an interval of not more than one meter but on either side of the couplers or bends or fittings, saddles shall be fixed at a distance of 30cm from the centre of such fittings. The saddles should be not less than 24 gauge for conduits Upto 25mm dia and not less than 20 gauge for larger diameter conduits. The corresponding widths shall be 19mm & 25mm. Where conduit pipes are to be laid along the trusses, steel joint etc. the same shall be secured by means of special clamps made of PVC. Where as it is not possible to drill holes in the trusses members suitable clamps with bolts and nuts shall be used. All fixing arrangement like saddles, special purpose clamps, nuts, bolts etc. shall deemed to be included in quoted rates of conduit.

For 25mm diameter conduit width of clip shall be 19mm and of 20 SWG. For conduit of 32mm and above, width of clip shall be 25mm and of 18 SWG.

Where conduit pipes are to be laid above false ceiling, either conduit pipes shall be clamp to false ceiling frame work suspended with suitable supports from the soffit of slab. For conduit pipe run along with wall, the conduit pipe shall be clamped to wall above false ceiling in uniform pattern with special clamps if required to be approved by the Engineer-In-Charge at site.

b) RECESS / CONCEALED CONDUIT

The chase in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the desired manner. In the case of building under construction, conduit shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. Incase of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work. Entire work of chasing the wall, fixing the conduit in chases, and during the conduit in mortar before plastering shall form part of point wiring work. (For chasing-chase cutting machine shall be used and no manual cutting shall be allowed).

The conduit pipe shall be fixed by means of stapples or by means of saddles not more than 60cm apart or by any other approved means of fixing. Fixing of standard bends and elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself w g radius which shall permit easy drawing in of conductors. All threaded joint of conduit pipe shall treated with some approved preservative compound to secure protection against rust. Suitable inspection boxes to the barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. These shall be mounted fl the wall. Suitable ventilating holes shall be provided in the inspection box covers. Wherever the length of conduit run is more than 10 meters, then circular junction box shall be provided to facilitate pulling of wires.

5.4 JUNCTION BOXES :-

Junction boxes shall be made of metal on all sides except on the front. Boxes shall be hot dip galvanized mild steel. Upto 20 x 30cm size M.S. box shall have wall thickness of 18SWG and PVC boxes above 20 x 30cm size shall be of 16 SWG.

The metallic boxes shall be painted with anticorrosive paint before erection. Clear depth of the box shall not be less than 61 mm. All fitting shall be fitted in flush pattern. 3mm thick phenolic laminated sheet complete shall be provided and fixed to junction box with brass screws.

5.5 UNDER FLOOR METAL DUCTING & CROSS OVER BOXES

The under floor ducting system shall be suitable for the distribution of power, voice & data cabling as per the distribution shown in the layout drawings. Under floor ducting shall be complete with all accessories required to complete the installation.

5.6 ERECTION AND EARTHING OF CONDUITS:-

The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth conforming to the requirement by means of special approved type of earthing clamp effectively fastened to conduit pipe in a workmanlike manner for a perfect continuity between the earth and conduit. Gas, water pipe shall not be used as earthing medium.

5.7 LIGHT & POWER ACCESSORIES :-

a) GENERAL

All light & power accessories shall be of modular range of plate switch type and shall be of one manufacturer (brand) and type. Switch & outlet boxes shall be of as per standard design of manufacturer.

b) LIGHT SWITCHES

All switch for control of light shall be of 6Amp unless otherwise stated. All switch shall be modular range of plate switch type. The switches shall be rocker mechanism type with silver contact. All switches shall be of white finish.

c) 6/16 AMP SWITCH SOCKET OUTLET

Switch socket outlet on lighting circuit shall be of 3 pin 6Amp outlet shall have safety shutters. The switch shall be of rocker mechanism type with silver contact. Socket outlet shall be shutter type and of modular range of plate type and having white finish. Switch and socket outlet shall be mounted on a suitable size GI box with suitable size modular cover plate.

Switch socket outlet on power circuit shall be of 6 pin 16/6 Amp outlet (Universal Socket) shall have safety shutters. The switch shall be of rocker mechanism type with silver contacts. Socket outlet shall be shutter type and of modular range of plate type and having white finish. Switch and socket outlet shall be mounted on a suitable size G.I. box with suitable size modular cover plate.

d) TELEPHONE OUTLET

Each Telephone outlet location shall be provided with 1 No. telephone Jack type outlet (RJ 11). The telephone outlet shall be of modular range of plate switch type and shall be mounted on a suitable size G.I. box with modular range cover plate.

e) DATA OUTLET (RJ-45)

Each data outlet location shall be provided with 1 No. data outlet (RJ 45). The data outlet shall be of modular range of plate switch type and shall be mounted on a suitable size G.I. box with modular range cover plate.

f) TV COAXIAL OUTLET

TV outlet shall be provided with modular range of cover plate, box and coaxial outlet. Cover plate shall match in shape & finish with other light and power accessories.

5.8 WIRING

All PVC insulated Fire Retardant (FR) copper conductor multi-stranded wires shall conform to relevant IS Codes. Cable size and material shall be as specified in BOQ.

All internal wiring shall be carried out with PVC insulated wires Fire Retardant (FR) of 650/1100 volts grade. The circuit wiring for points shall be carried out in looping in system and no joint shall be allowed in the length of the conductors. Circuit wiring shall be laid in separate conduit originating from distribution board to switch board for light/fan. A light/fan switch board may have more than one circuit but shall have to be of same phase. Looping wiring shall be drawn in same conduit as for point wiring. Each circuit shall have a separate neutral wire. Neutral looping shall be carried out from point to point or in light/fan switch boards. A separate earth wire shall be provided

along with circuit wiring for each circuit. For point wiring red color wire shall be used for phase and black color wire for neutral. Circuit wiring shall be carried out with red, yellow or blue PVC insulated wire for RYB phase wire respectively and black color PVC insulated wire for the neutral wires. Bare copper wire shall be used as earth conductor and shall be drawn along with other wires. No wire shall be drawn into any conduit until all work of any nature, that may cause injury to wire is completed. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire.

Before the wires are drawn into the conduit, the conduits shall be thoroughly cleaned of moisture, dust and dirt. Drawing of copper conductor wires & cables shall be as per CPWD specifications.

5.9 JOINTS

All joints shall be made at main switches, distribution board socket and switch boxes only. No joint shall be made in conduits & junction boxes. Conductors shall be continuous from outlet to outlet.

5.10 SUB MAINS

Sub main wiring shall be carried out with PVC Insulated Copper conductor multi-stranded wires/cables Fire Retardant (FR) in suitable PVC Conduit unless otherwise called for.

Sub main cable where called for shall be of the rated capacity and approved make. Every sub main shall be drawn into an independent adequate size conduit. Adequate size draw boxes shall be provided at convenient locations to facilitate easy drawings of the sub main cables. Cost of junction box/drawn box is deemed to be included in the rates of wiring. An independent earth wire of proper rating shall be provided for every sub main. Single phase sub main shall have single earth wire whereas three phase sub main shall be provided with two earth wire. The earth wire of proper size shall be fixed to conduits by means of suitable M.S. clips at not more than 1000mm distance.

Where sub mains cables are connected to the switchgear, sufficient extra lengths of sub main and mains cable shall be provided to facilitate easy connections and maintenance. For termination of cables criping type cable socket/lugs shall be provided. Same color code as for circuit wiring shall be followed.

5.11 Maximum number of PVC insulated 650/1100 V grade aluminum/copper conductor cable conforming to IS : 694 – 1990, that can be drawn into rigid PVC Conduit.

Nominal Cross Sectional Area of conductor in Sq.mm	20mm		25mm		32mm		38mm		51mm		64mm	
	S	B	S	B	S	B	S	B	S	B	S	B
1	2	3	4	5	6	7	8	9	10		11	12	13	
1.50	5	4	10	8	18	12	-	-	-	-	-	-		
2.50	5	3	8	6	12	10	-	-	-	-	-	-		
4	3	2	6	5	10				8	-	-	-	-	-
6	2	-	5	4	8	7	-	-	-	-	-	-		
10	2	-	4	3	6	5	8	6	-				-	-
16	-	-	2	2	3	3	6	5	10				7	12		8
25	-	-	-	-	3	2	5	3	8	6	9	7				
35	-	-	-	-	-	3	2	6	5	8	6					
50	-	-	-	-	-	-	5	3	6	5						
70	-	-	-	-	-	-	4	3	5	4						

NOTE :

1. The above table shows the maximum capacity of conduits for a simultaneous drawing in of cables.

2. The columns headed ‘S' apply to runs of conduits which have distance not exceeding 4.25m between draw in boxes and not deflect from the straight by an angle of more than 15 degrees. The columns headed `B' apply to runs of conduit which deflect from the straight by an angle of more than 15 degrees.

3. Conduit sizes are the nominal external diameters.

5.12 LOAD BALANCING

Balancing of circuits in three phase installation shall be planned before the commencement of wiring and shall be adhered to.

5.13 COLOUR CODE FOR CIRCUIT & SUB MAIN WIRING

Color code for circuit & sub main wiring installation shall be Red, Yellow, Blue for three phases. Black for neutral and yellow/green or green only for earth incase of insulated earth wire.

5.14 CLASSIFICATION OF POINTS

General

Classification and measurement of Point wiring shall b s follows :

a) Conduiting & wiring from switch to First point including circuit wiring along with Conduits, Switch, Cover plate and Box shall be classified as "One point (First point) controlled by one number 6 Amp one way / two way switch".

b) Conduiting & wiring from First point to next point to be controlled by same switch in same circuit shall be classified as "Looping Points".

5.15 CONDUCTOR SIZE

Wiring shall be carried out with following sizes of Fire Retardant (FR) PVC insulated multi-stranded single core copper conductor wire/cable.

i	Light point	-	1.5 Sq.mm
ii.	Ceiling/ Exhaust Fan Point	-	1.5 Sq.mm
iii.	Plug Point (5 A S.S. outlet)	-	1.5 Sq.mm
iv.	Circuit Wiring	-	2.5 Sq.mm
vi.	General Power Point (16A S.S. outlet)		
	a) First Point	-	4.0 Sq.mm
	b) Second Point	-	2.5 Sq.mm
vii.	Hand Drier	-	4.0 Sq.mm

5.16 TELEPHONE WIRE / CABLES

Separate conduits shall be provided for internal telephone wiring of telephone system commencing from Jack Panel telephone outlet shall be wired with 2 Pair unarmoured Telephone cable.

6.0 INSTALLATION OF LIGHT FIXTURES

6.1 SUPPORTS AND FIXINGS

Where fluorescent luminaries 1200 mm or more in length are supported directly by the conduit system they shall be fixed to circular conduit boxes both of which shall form an integral part of the conduit system.

Where the weight of the luminaries is supported by a conduit box or cable trunking the fixing of the conduit box or trunking shall be adequate for the purpose and approved by Owner/PMC/Consultant.

Luminaries fitted with tungsten filament, lamps and having metal back plates shall not be fixed directly to which the thermoplastic material is the principal load bearing member.

Support of luminaries from cable trunking shall be by means of appropriate clamps or brackets.

Luminaries mounted on or recessed into suspended ceilings shall not be support on the false ceiling unless specifically approved.

For wall mounted luminaries, the mounting height specified on drawings shall be above finished floor level measured to the centre of the conduit box, unless otherwise indicated.

6.2 WIRING CONNECTIONS

Where luminaries, other than those are fixed direct to circular boxes or supported by pendants or chains, the final wiring shall terminate at a terminal block in the conduit box.

Where luminaries having fluorescent tubes are fixed direct to circular conduit boxes, the final circuit wiring may be terminated within the luminaries unless otherwise indicated. The wiring shall enter each luminaries at the conduit entry

nearest to the terminal block and where the loop - in wiring system is used leave by same entry wiring shall not pass through a luminaries. 64

Where luminaries are mounted on or recessed into a suspended ceiling connection shall be by flexible cord from ceiling rose shall be located not more than 500 mm fro he access panel in the ceiling and shall be firmly supported unless otherwise approved by the consultant.

Cables and flexible cords for final connections to luminaries shall be suitable for the operating temperature of the luminaries. Flexible cords for chain suspensions, if any shall have a white sheath unless otherwise indicated.

The size of final connection cables or flexible cords shall be as indicated.

Cables and cords passing close to ballast within a luminaries shall be suitable for the operating temperature of the ballast. Heat resistant sleeves shall be provided.

A protective conductor shall connect the earthing terminal or earthing contact of each luminaries to an earthing terminal located in the adjacent conduit box. Where the final connection is by flexible cord the protective conductor shall form part of the cord.

Where luminaries are recessed in the false ceiling, luminaries shall be suspended with PVC Conduit with ball & socket arrangement, check nut etc. Suspension arrangement shall be fixed to steel/RCC structure with suitable purpose made clamps etc. (Cost of suspension arrangement is deemed to be included in the rate of installation/erection of luminaries). Contractor shall submit the shop drawing for proposed arrangement of various types of light fixtures in various type of ceiling and shall obtain necessary approval from the Engineer-in-Charge.

The light fixtures and fans shall be assembled and installed in position complete and ready for service in accordance with the detailed drawings, manufacturer's instructions and to the satisfaction of the Engineer - In - Charge. Fixtures shall be true to alignment plumb level and capable of resisting all lateral and vertical forces and shall be fixed as required. All ceiling fans shall be provided with suspension arrangement in the concrete slab/roof members. It shall be the duty of the contractor to make these provisions at the appropriate stag & locations shown on the drawings. Fan hook shall be as per CPWD specifications. Suspended type fluorescent light fixture shall be fixed to junction box with a metallic ball and socket arrangement. Light fixture in general shall be directly fixed to ceiling slab with rawl plugs. All switch and outlet boxes shall be bonded to earth through connector blocks. MS pipe shall be fixed with suitable fixing accessories and metal continuity shall be maintained.

7.0 CONDUITING & WIRING FOR TELEPHONE SYSTEM & DATA NETWORKING

7.1 GENERAL

This section shall cover for conduiting and wiring for Telephone and Data Networking. Conduiting for Data and Telephone System shall be from data outlet / telephone outlet to patch / Jack Panel.

7.2 CONDUITING FOR TELEPHONE

Conduiting for telephone system shall be carried out in PVC Conduit. Separate conduit shall be provided for Telephone cables.

7.3 WIRING

Each telephone outlet shall be wired in conduit with 2 Pair unarmored Telephone cable .

Telephone outlet connected to Jack/patch panel.

7.4 TELEPHONE OUTLETS

All telephone outlet shall be modular plate type accessories with RJ 11 Jack outlet. Cover plate shall match in shape & finish with other light and power accessories.

7.6 CONDUITING FOR DATA NETWORKING

Wiring for Data Networking System shall be carried out in PVC Conduit and in G.I. trunking system. Conduiting shall be carried out as per clause No.5.0 of this specification.

7.7 DATA & TV OUTLETS

All Data Networking System outlets shall be provided w modular range of cover plate, box and coaxial outlet. Cover shall match in shape & finish with other light a ccessories. For data outlet (RJ-45) shall be provided.

7.8 JUNCTION BOX

Suitable size of metallic junction box shall be provided for termination of conduit for telephone and Data Networking. Box shall be made of 1.6mm thick MS Sheet and shall be treated before painting. Front of the junction box shall be provided with 3mm thick phenolic laminated sheet cover.

7.9 COMPUTER DATA NETWORKING SYSTEM (Passive Components)

7.9.1 CABLES

Cat 6 UTP cable in PVC Conduit shall be used for wiring data point from Jack / Patch panel to each outlet.

7.9.2 JACK PANEL

24 Port Power sum Jack Panel meeting all the requirements of T568A & ISO 118001 & have been tested & verified by Electronic Centralia.

7.9.3 INFORMATION OUTLET

Information Outlet RJ45 with shutter for dust protection & should be colour coded for T568A/B wiring configuration & compatible to 110 tools.

Duplex Faceplates with provision for 2no. information outlet & with complete gang box assembly.

7.9.4 RACK

19 inches standard Racks with see through lockable door, cable management accessories, power distribution box, heat dissipation with fan tray & switch trays. Racks upto 15' shall be wall mounted cabinet.

Floor mounted 19" inch standard 42u rack shall be prov in the server room. Rack with see through lockable door, cable management accessories distribution box, fan for fan tray & switch trays/data manager.

D) AUDIO VISUAL WORKS

Professional Display 55''

Display	
Screen Size	55"
Resolution	1,920 x 1,080
Brightness	350 nits
Contrast Ratio	5,000:1
Aspect Ratio	16:9
Pixel Pitch	0.21(H) x 0.63(V)
Color Supported	16.7M
Viewing Angle (H/V)	178 / 178
Response Time (G-to-G)	8 ms

Signal Input	
Video Signal	Analog D-SUB, DVI-D, Component, CVBS, HDMI

Power	
Power Consumption	164 W (Max) / 124 W (Typ)
Power Supply	Internal

Operation Conditions	
Temperature	0? - 40?
Humidity	10 - 80%

Features	
Multimedia Speakers	10 W + 10 W
VESA Mount	400 x 400

Internal Player	Processor	Cortex-A8 Single Core CPU with NEON DSP
	On-Chip Cache Memory	L1 (I/D) : 32KB / 32KB, L2 (Unified) : 512KB
	Clock Speed	Up to 800MHz
	Main Memory Interface	Dual 32bit DDR3-667 (1333MHz)
	Graphics	2D & 3D Graphics Engine
	Storage (FDM)	4GB (1.2GB Occupied by O/S, 2.8GB Available)
	Multimedia	Video Decoder, Audio DSP (Decoder)
	Host Bus	PCIEx 2.0
	IO Ports	USB 2.0

	Operating System	Linux

Display_Panel 46''
Display

Screen Size	46"
Resolution	1,920 x 1,080
Brightness	350 nits
Contrast Ratio	5,000:1
Aspect Ratio	16:9
Pixel Pitch	0.15375(H) x 0.46125(V)
Color Supported	16.7M
Viewing Angle (H/V)	178 / 178
Response Time (G-to-G)	8 ms

Signal Input	
Video Signal	Analog D-SUB, DVI-D, Component, CVBS, HDMI

Power	
Power Consumption	136 W (Max) / 94 W (Typ)
Power Supply	Internal

Operation Conditions	
Temperature	0? - 40?
Humidity	10 - 80%

Features	
Multimedia Speakers	10 W + 10 W
VESA Mount	400 x 400

Internal Player	Processor	Cortex-A8 Single Core CPU with NEON DSP
	On-Chip Cache Memory	L1 (I/D) : 32KB / 32KB, L2 (Unified) : 512KB
	Clock Speed	Up to 800MHz
	Main Memory Interface	Dual 32bit DDR3-667 (1333MHz)
	Graphics	2D & 3D Graphics Engine
	Storage (FDM)	4GB (1.2GB Occupied by O/S, 2.8GB Available)
	Multimedia	Video Decoder, Audio DSP (Decoder)
	Host Bus	PCIEx 2.0
	IO Ports	USB 2.0
	Operating System	Linux

Dimension	
Product Dimensions (Without Stand)	1,057.7 x 615.8 x 94.9 mm
Shipment Dimensions	1,154 x 723 x 165 mm

Weight	
Product Weight	12.2 kg
Shipment Weight	14.7 k

PROJECTOR

PROJECTION TECHNOLOGY RGB liquid crystal shutter projection system (3LCD)

LCDSIZE 0.63” without MLA (D7)

NATIVE RESOLUTION XGA (1024 x 768)

PROJECTION LENS TYPE Optical Zoom (Manual) / Focus (Manual

F-NUMBER 1.51 - 1.99

ZOOM RATIO 1 - 1.6

THROW RATIO 1.38 - 2.24 (Wide - Tele)

LAMP TYPE275W UHE

LIFE (NORMAL/ECO) 3,000 hours / 4,000 hours

SCREEN SIZE (PROJECTED DISTANCE) 30” - 300” [0.84m - 8.4m] (Zoom: Wide)
30” - 300” [1.36m - 13.9m] (Zoom: Tele

BRIGHTNESS 4,000lm

WHITE LIGHT OUTPUT (NORMAL/ECO) 4,000lm / 3,200lm

CONTRAST RATIO 2,500:1

INTERNAL SPEAKER 10W Monaural

KEYSTONE CORRECTION

VERTICAL/HORIZONTAL ANGLE ±30° / ±30° (Zoom: Tele)

AUTO KEYSTONE CORRECTION Yes (Vertical: ±30°)

CONNECTIVITY

D-SUB 15PIN(02)

COMPOSITE(01)

S-VIDEO (01)

DIGITAL INPUT

HDMI 01

OUTPUT TERMINAL

D-SUB 15PIN(01)

AUDIO INPUT

RCA (WHITE/RED) 1Pair

STEREO MINI-JACK 2

Audio Output

STEREO MINI-JACK 1

Others

USB TYPE A 1
USB TYPE B 1

CONTROL I/ORS-232C D-sub 9pin x 1

NETWORK Wired Lan RJ45 x 1 (10/100Mbps

OPERATING TEMPERATURE5°C - 35°C <41°F - 95°F> (20% -80% humidity, unfrozen)
BELOW 1,500M / 4,921FT

OPERATING ALTITUDE 0m - 2,286m <0ft - 7,500ft> (over 1,500m / 4,921ft: with high altitude mode)

DIRECT POWER ON/OFF Yes
START-UP PERIOD 8 seconds
COOL-DOWN PERIOD Instant Off

POWER SUPPLY VOLTAGE 100V - 240V AC +/- 10%, 50Hz / 60Hz

POWER CONSUMPTION (220V - 240V)

LAMP ON (NORMAL/ECO) 363W / 297W
STANDBY (NETWORK ON/OFF) 4.3W / 0.33W
FAN NOISE (NORMAL/ECO) 39dB / 35dB

Projector Screen 01 no

100" diagonal (5'x7') Matt White Motorized (with Remote)

Video Conferencing System

1. The video codec must support the following at a minimum:
    a. 1920x1080 resolution
        i. With Progressive Scan @ 30 frames per second
    b. 1280x720 resolution
        i. With Progressive Scan @ 60 frames per second
        ii. With Progressive Scan @ 30 frames per second
        iii.
2. The video conference system must utilize a minimal consumption of bandwidth of 768 kbps when supporting 720p30, support a minimum of two external Full HD displays, 1920x1080p, for a crystal-clear picture and data-sharing, automatic noise reduction, automatic gain control and echo cancellation, a Full HD PTZ 10x optical zoom camera, high definition audio from 100 Hz up to 16 kHz, full duplex audio for natural conversations, one-touch easy recording recording indicator, support either MPEG4 or H.264 video standards. When recording using MPEG4, the appliance should not be seen to be a participant in the call but must provide a simple recording notification on all participants.
3. The video codec's capability or quality when sending and receiving dual streams must not be compromised when recording to an external appliance.
4. The video conference system must support auto-discovery address/directory lookup, conference phone or optional, NAT/firewall traversal (H.460/SIP), backup and restore functionality, external management tool for configuration, backup and restore, the ability for IT staff to remotely see, via the web, snapshots of an ongoing

conference, low bandwidths down to a minimum of 128 kbps, support Microsoft OCS, must support single-cable HDMI connectivity to an HD display, sending and receiving two separate streams simultaneously in either a point–to-point or multipoint calls. The dual streams supported must be, at a minimum:

1080p30 and 720p5
720p60 and 720p5
720p30 and 720p30

5. The video codec must support the following audio and video standards: H.261, H.263, H.263+, H.264, G.711, **G.722**, G.722.1c, G.728, G.729, MPEG4-AAC-LC.
6. The video codec must support audio input via a standard 3.5mm audio jack.
7. The video codec must support a directly connected audio conference phone. Both the video codec and the phone must support 802.3af for this connection.
8. The video codec must support a fast Ethernet interface.
9. The video codec must be controllable via:
   - A supplied infrared remote control
   - A universal infrared remote control (such as a Logitec mony Remote Control)
   - A web-based interface
   - A third-party programmable control device through the following interfaces:
     - RS-232 and USB
     - Internet Protocol
10. The video codec must support secure calling using H.235, including strict compliance.
11. The video codec must support both IPv4 and IPv6.

44 The video codec must provide the following built-in multipoint capability, at a minimum, using either continuous presence or voice-activated switching:

Up to 3 other codecs dialing into the codec at 1080p with 30 fps
Up to 3 other codecs dialing into the codec at 720p with 60 fps
Up to 3 other codecs dialing into the codec at 720p with 30 fps
The video codec must provide transcoding support in a multipoint call.

45. The video codec must provide support for H.323 Annex Q for each participant in a multipoint call.
46The video codec must provide support for H.239/SIP fro y participant in a multiway call.
47The video codec must support dual cameras.
48.The video codec must support a PSTN circuit that is directly connected.

Video Conferencing Camera Specifications :

1. The camera must support 1080p real resolution, not interpolated, 30 fps in progressive mode when delivering 1080p resolution, progressive mode when delivering 720p resolution, a resolution of 1920x1080 at a minimum. Such support cannot be attained by combining a lower native resolution and user scalers to increase resolution output, an single cable (that can be removed, using external equipment) cable lengths up to 52 m/170 ft., HDMI at a minimum of 3 m/9.8 ft., manual setup of the white balance (e.g., by letting the user choose from several profiles), both automatic and manual white balance, focus range from 51 cm (20”) to infinity, must work in conditions ranging from 150 lux to daylight.
2. The camera’s sensor type must be CMOS, 2,073,600 effective pixels and signal-to-noise ratio must be 52 dB or less.
3. The camera’s pan angle must be at least +/- 87.5° (245° total view range).
4. The camera’s tilt angle must be at least +/- 30° (102° total view range).
5. The camera must allow at least 10 camera presets to be used from the video endpoint’s remote control.
6. The camera must be remote controllable via the video endpoint’s remote control, an external power supply supporting 100-240VAC 50/60Hz, a standard 1/4-20 tripod mount, a self check-up feature\ and must have auto-focus.
7. OPTIONAL criterion:
   The camera must be gray/silver (shows less visible dust).
8. The camera must support a manual camera flicker control with options set to auto, 50 Hz or 60 Hz., manual adjusting of the auto exposure to adjust the camera brightness to room conditions, adjusting color temperature adjustments to optimize room setting conditions, auto-exposure options to optimize room setting conditions.

Gooseneck Microphones for Conference table

Bass filter	250 Hz, -10 dB bei 50 Hz
Impedance	<=600 ohms
Recommended load impedance	>=2,000 ohms
Supply voltage	9 to 52 V phantom power to DIN/IEC
Powering	<=3.5 mA
Connector	3-pin male XLR
Finish	matte dark grey
Dimensions	max. dia.: 20 mm (0.8 in.), length: 260/405/600 m (10.2/15.9/23.6 in.)
Net weight	140/430 g (4.9/15.2 oz.), 110/522 g (3.9/18.4 oz.), 194/573 g (6.8/20.2 oz.)

Polar pattern	cardioid
Frequency range	50 to 20,000 Hz
Sensitivity	20 mV/Pa (-34 dBV) re 1 V/Pa
Max. SPL	125 dB (for 1 % THD)
Equivalent noise level (IEC 60268-4, A-weighted)	21 dB-A
Signal/noise ratio (A-weighted)	73 dB
Impedance	<=600 ohms
Recommended load impedance	>=2,000 ohms
Powering	<3 mA
Connector	Discreet Acoustics Modular standard
Finish	matte dark grey
Net weight	5 g (0.17 oz.)
Shipping weight	88 g (3.1 oz.)

Gooseneck Mikes for Stage and Podium

Bass filter	250 Hz, -10 dB bei 50 Hz
Impedance	<=600 ohms
Recommended load impedance	>=2,000 ohms

Supply voltage	9 to 52 V phantom power to DIN/IEC
Powering	<=3.5 mA
Connector	3-pin male XLR
Finish	matte dark grey
Dimensions	max. dia.: 20 mm (0.8 in.), length: 260/405/600 m (10.2/15.9/23.6 in.)
Net weight	140/430 g (4.9/15.2 oz.), 110/522 g (3.9/18.4 oz.), 194/573 g (6.8/20.2 oz.)

polar pattern	hypercardioid
Frequency range	50 to 20,000 Hz
Max. SPL	125 dB (for 1 % THD)
Equivalent noise level (IEC 60268-4, A-weighted)	21 dB-A
Signal/noise ratio (A-weighted)	73 dB
Impedance	<=600 ohms
Recommended load impedance	>=2,000 ohms
Powering	<3 mA
Connector	Discreet Acoustics Modular standard
Finish	matte dark grey
Net weight	5 g (0.17 oz.)
Shipping weight	88 g (3.1 oz.)

Shock Mount For Microphones

This mount provides attenuation of structure-borne noise by 12 dB
consists of a durable plastic shell and flexible inner rubber boot. It allows for quick and easy set up and break down of a sound system

Wireless MICS

Receiver Specifications
Carrier frequency range Band 7: 500 to 530 MHz (complies with new US regulation),
Band 8: 570 to 600 MHz (complies with new US regulation),
Band 1: 650 to 680 MHz (complies with new US regulation),
Band 2: 680 to 710 MHz,
Band 3: 720 to 750 MHz,
Band 5: 790 to 820 MHz,
Band 6: 835 to 865 MHz
Switching bandwidth _ 30 MHz (country dependent)
Sensitivity 7 dB _ V / -100 dBm
Diversity System Microprocessor-controlled diversity
Modulation Wideband FM
Audio bandwidth 35 – 20 000 Hz (± 3 dB)
T.H.D. _ 0.3 %

SNR (A-weighted) typ. 120 dB(A)
Audio outputs 1 x XLR sockets balanced
1 x TS _" / 6.3 mm jack sockets unbalanced
Dimensions _ 19 inch 1U rack, 202 mm (7.8 in.) _ 44 mm (1.7 in.) _ 190 mm (7.4 in.)
Net / Shipping Weight 972 g (2.2 lbs.)
Standard Accessories 2 UHF antennas, power supply, rack mount kit

Handheld Transmitter Specifications

Carrier frequency range Band 7: 500 to 530 MHz (complies with new US regulation),
Band 8: 570 to 600 MHz (complies with new US regulation),
Band 1: 650 to 680 MHz (complies with new US regulation),
Band 2: 680 to 710 MHz,
Band 3: 720 to 750 MHz,
Band 5: 790 to 820 MHz,
Band 6: 835 to 865 MHz
Switching bandwidth _ 30 MHz (country dependent)
RF output power 10 or 50 mW (ERP, country dependent)
Modulation / Bandwidth Wideband FM
Microphone capsules D 5 – dynamic (super cardiod)
C 5 – condenser (cardioid)
Max. SPL _ 144 dB SPL
Audio bandwidth 35 – 20 000 Hz (± 3 dB)
T.H.D. _ 0.7 %
SNR (A-weighted) > 120 dB(A)
Battery life _ 6 hours with one 1.5 V LR6 AA alkaline battery
_ 8 hours with one 1.2 V AA rechargeable battery (min. 2100 mAh)
Dimensions 237 mm (9.3 in.) length, 51 mm (2 in.) dia.
Net / Shipping Weight 240 g (8.5 oz.) without batteries
Standard Accessories 1 x AA size LR6 battery, stand adapter, windscreen

DSP

Front Panel Led Indicators:
Per Input: Signal Present, CLIP, 48V (Input only)
Other: COM, STAT, ERR, PWR

Analog Inputs: 12 electronically balanced on Phoenix Combicon removable screw connectors
Mic/Line Inputs: Nominal gain 0dB, electronically switchable up to +48dB,in +6dB steps
Input Impedance: 3.0k_
Maximum Input Level: +20dBu with 0dB input gain,+8dBu with 12dB gain
CMRR: >75dB at 1KHz
Input Noise (E.I.N.): <-125dBu typical with 150_
Phantom Power: 48V nominal, selectable per input
A/D Latency: 37/Fs [0.77ms@48k]
Analog Outputs: 8 electronically balanced on Phoenix/Combicon removable screw connectors
Maximum Output Level: +19dBu
Frequency Response: 20Hz-20KHz (+0.5dB/-1dB)
THD: <0.01% 20Hz to 20KHz, +10dBu output
Dynamic Range: 108dB typical, 22Hz-22KHz unweighted
Crosstalk: <-75dB
Output Impedance: 40_ 20_
D/A Latency: 29/Fs [0.60ms@48k]

AEC Processing: 12 independent algorithms
AEC Processing Latency (Original 8k Algorithm): 2385/Fs [49.69ms@48k]
AEC Processing Latency (Full Bandwidth Algorithm): 1609/Fs [33.52ms@48k]
Tail Length: 200 ms
Average Convergence Rate: 49 dB/s (Net convergence over multiple FFT bands)

Control Ports: 12 inputs and 6 outputs
Control Input Voltage: 0 to 4.5v
Control Input Impedance: 4.7k_ -wire mode), >1M_ -wire mode)

Logic Output Voltage: 0 or +5V unloaded
Logic Output Impedance: 440_
Logic Output Current: 10mA source, 60mA sink

Watchdog Output: Phoenix/Combicon connector for failsafe control
Opto Output Current: 14mA maximum
Withstanding Voltage: 80V maximum (Off)
Series Impedance: 220_ _

Control Network:
Connectors: RJ45 Ethernet connector
Maximum Cable Length: 100m/300ft on Category 5 cable between device and Ethernet switch

BLU link:
Connectors: 2 x RJ45 Ethernet connectors
Maximum Cable Length: 100m/300ft on Category 5e cable between devices
Max. Number of Nodes: 60
Latency: 11/Fs [0.23ms@48k]
Pass Through Latency: 4/Fs [0.08ms@48k]

Power and Dimensions:
Mains Voltage: 100-240V AC, 50/60Hz
Power Consumption: <55VA
BTU Rating: <188 BTU/hr
Operating Temp. Range: 5 (41) to 35 (95) degrees C (degrees F)
Dims: (H(U) x W x D): 1.75” (45mm)(1U) x 19” (483mm) x 12.5” (318mm)

Audio Amplifier

CHANNELS	8
Sensitivity	1.4V
Rated Power Output	125W per CH @ 4 ohms 125W per CH @ 8 ohms
Signal to Noise Ratio (below rated power 20Hz to 20kHz, A-Weighted	110dB
Total Harmonic Distortion (THD) (full rated power, 20Hz - 20kHz)	< 0.05%
Intermodulation Distortion (from 0dB down to -30d	< 0.05%
Frequency Resp onse (at 1W into 4/8 ohms)	± 0.5dB
Cross talk (below rated power 20Hz to 1kHz	> 70dB
Common Mode Rejec tion (20Hz to 1kHz)	> 55dB,typically > 70dB

Ceiling mount speakers 15 watt speaker. Model

Frequency Range1: 85 Hz - 25 kHz
30 Watts Continuous Program Power
15 Watts Continuous Pink Noise
Nominal Sensitivity3: 86 dB SPL @ 1 m (3.3 ft)
Crossover Frequency: 3.5 kHz
Rated Maximum SPL: Control 24C Micro: 98 dB @ 1 m (3.3 ft)

Transducers
Low Frequency: 115 mm (4.5 in) IMG (injection molded graphite), 24 mm (1 in) voicecoil

High-Frequency: 12 mm (0.5 in) polycarbonate
Physical:
Backcan: Formed steel
Baffle/Rim: Medium impact polystyrene, fire rated UL94V-O
Secondary Attachment Point: Included
Termination Screw-down terminals, touch-proof, UL, CE and VDE rated, outside of backcan
Safety Agency Rating: Suitable for use in air handling spaces per UL1480, UL2043, NFPA90 & NFPA 70. S7232/UL Listed, Signaling Speaker.
Transformer UL registered per UL1876. In accordance with IEC60849/EN60849

PODIUM

Customized podium as per customer specifications

VGA Distribution Amplifier one input 6 output

INPUT: 1 XGA on a 15- pin HD (F) connector.
OUTPUTS: 6 XGA on 15- pin HD (F) connectors.
MAX. OUTPUT LEVEL: 1.7Vpp.
BANDWIDTH: 500MHz.
DIFF. GAIN: 0.09%.
DIFF. PHASE: 0.01Deg.
K-FACTOR: <0.05%.
S/N RATIO: 72dB.
CONTROLS: 0 to +10dB EQ.
COUPLING: DC.
POWER SOURCE: 100- 240V AC, 50/60Hz, 18VA

Switcher 4input 1 output VGA and audio Switcher

INPUTS: 4 UXGA on 15- pin HD connectors; 4 unbalanced stereo audio on 3.5mm mini jacks.
OUTPUTS: 1 UXGA on a 15- pin HD connector; 1 UXGA on a 15- pin HD connector (IN 1 LOOP); 1 unbalanced stereo audio on a 3.5mm mini jack; 1 unbalanced stereo audio on a 3.5mm mini jack(IN 1 LOOP).
MAX. OUTPUT LEVEL:
Video: 1.8Vpp; Audio: 7.2Vpp.
BANDWIDTH (-3dB):
Video: 300MHz; Audio: >40kHz.
DIFF. GAIN: 0.03%.
DIFF. PHASE: 0.06Deg.
K-FACTOR: <0.05%.
S/N RATIO: Video: 73dB @5MHz; Audio: 93dB.
CROSSTALK (all hostile):
Video: –50dB @5MHz; Audio: –72dB @1kHz.
CONTROLS: Input selector; PANEL LOCK and OFF pushbutto IR remote control reception window; connected IR reception; RS- 232 connector; contact closure terminal block for external wire switching; input priority selector DIP- switches; normal/Kr- isp® and program/normal mode selectors via slide switches on the underside.
COUPLING: Video: DC; Audio: DC.

AUDIO THD +
NOISE:
0.004% @1kHz.
AUDIO 2nd
HARMONIC:
0.002% @1kHz.
POWER SOURCE: 12V, 230mA.
DIMENSIONS: 21.5cm x 16.25cm x 4.36cm (8.46” x 6.4” x 1.7”) W, D, H.

Scaler HDMI to computer Graphics Video.

INPUT: 1 HDMI connector.
OUTPUTS: 1 VGA on a 15- pin HD connector, RGBHV/YPbPr; 1 unbalanced stereo audio on RCA connectors.
OUTPUT RESOLUTIONS: PC: VGA, SVGA, XGA, 1280x800, UXGA, SXGA, WXGA, SXGA+, WXGA+, WSXGA+;
HDTV: 480p, 576p, 720p @50/60Hz, 1080p @50/60Hz, 1080i @50/60Hz.
OUTPUT REFRESH
RATE:
60Hz for computer graphics resolutions, 50/60Hz for HDTV resolutions.
PROCESSING DELAY: 3 frames.
CONTROLS: Front panel buttons, ON and component output LEDs.
POWER SOURCE: 5V DC, 860mA

VGA Distribution Amplifier One input 2 output VGA distribution Amplifier

TECHNICAL SPECIFICATIONS
INPUT: 1 UXGA on an 15- pin HD connector.
OUTPUTS: 2 UXGA on 15- pin HD connectors.
MAX. OUTPUT LEVEL: 2.2Vpp.
BANDWIDTH (-3dB): 400MHz.
DIFF. GAIN: 0.03%.
DIFF. PHASE: 0.03Deg.
K-FACTOR: <0.05%.
S/N RATIO: 72dB @5MHz.
CONTROLS: ID BIT switch; analog/TTL switches for setting the sync.
COUPLING: DC.
POWER SOURCE: 5V DC, 130mA

2 INPUT one output vga switcher

INPUTS: 2 computer graphics video on 15- pin HD connectors;2 unbalanced stereo audio on 3.5mm ni jacks.
OUTPUTS: 1 computer graphics video on a 15- pin HD connector; 1 computer graphics video looping on a 15- pin HD connector;1 unbalanced stereo audio on a 3.5mm mini jack.
MAX. OUTPUT
LEVEL:
Video: 1.6Vpp; Audio: >10.5Vpp.
BANDWIDTH (-
3dB):
Video: 300MHz; Audio: >100kHz.
DIFF. GAIN: 0.03%.
DIFF. PHASE: 0.03Deg.
K-FACTOR: <0.05%.
S/N RATIO: Video: 71dB; Audio: 71dB weighted.
CROSSTALK: Video: –59dB @5MHz; Audio: <–66dB @1kHz.
CONTROLS: Contact closure remote control, input default selection switch.
COUPLING: DC.
AUDIO THD + NOISE:, <0.032%., AUDIO 2nd ,HARMONIC:,<0.004%. and POWER SOURCE: 5V DC 200mA

Audio distribution Amplifier One Input 5 output audio distribution Amplifier

TECHNICAL SPECIFICATIONS

INPUT: 1 unbalanced stereo/balanced mono, 1Vpp/33k? on a 3.5mm mini jack.
OUTPUTS: 5 unbalanced stereo/balanced mono, 1Vpp/50? on 3.5mm mini jacks.
MAX. OUTPUT: 5Vpp.
AUDIO BANDWIDTH (-3dB): 20kHz.
S/N RATIO: 80dB unweighted.
CONTROL: Left and right gain rear trimmers (0 to +3.5dB).
COUPLING: AC.
AUDIO THD + NOISE: 0.03% (2nd harmonic).
POWER SOURCE: 12V DC, 100mA.
DIMENSIONS: 12cm x 7.5cm x 2.5cm (4.7” x 2.95” x 0.98”) W, D, H.

Cable Cubby
Cable Cubby one female 15-pin HD connectpr,2 RJ45(Cat 6)Network, data connectors 1 audio input,Ac outlet
Video input
Number/signal type : 1 VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, HDTV component video
Connectors : 1 female 15-pin HD
Video output
Number/signal type : 1 pass-through VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, HDTV component video
Connectors : 5 female BNC on pigtails
Audio input
Number/signal type : 1 stereo, unbalanced
Connectors :1 female 3.5 mm stereo jack
Audio output
Number/signal type : 1 pass-through stereo, unbalanced
Connectors :(1) 3.5 mm, direct insertion captive screw connector, 3 pole
General
Mounting
Furniture mount : Yes
Min/max table thickness 0.375" to 3.00" (0.95 cm to 7.62 cm)
Enclosure type Metal
Enclosure dimensions
op plate (outer rim): 8.18" W x 6.375" D (20.79 cm W x 16.19 cm D)
Top plate (inside tilt plate) 5.90" W x 4.10" D (14.99 cm W x 10.41 cm D)
Surface cutout (inside rim) 7.70 +0.00/-0.02" W x 5.90 +0.00/-0.02" D
(19.56 +0.00/-0.05 +cm W x 14.99 0.00/-0.05 +cm D)
Box (under surface) :4.0" H x 6.3" W (front of unit) x 5.0" D (10.2 cm H x 15.9 cm W x 12.7 cm D)
without clamps
4.0" H x 10.0" W (front of unit) x 5.0" D (10.2 cm H x 25.3 cm W x 12.7 cm D)
with clamps

Vibration :ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance
Safety : CE, c-UL, CSA C/US, UL
MTBF 30,000 hours

Rack Box
Rack box 20 U closed Rack with Castor wheels , Shelf PDU and Lock

Installation and Cabling Along With AV Cabling
Cables and Connectors High Quality VGA and Audio Cables and Connectors

Installation commissioning testing programming and support for one year

SECTION-II : APPROVED MAKES OF MATERIALS

NOTE: All the materials mentioned below shall be ISI approved or equivalent. Incase of unavailability of any material ofspecific make an equivalent make can be used only after a written approval of Owner/PMC. Also the make listed at the first place shall be the preferred make. The make/ brand of any other item will be as mentioned in the drawings issued by the Owner/PMC.

The contractor shall provide samples of all materials mentioned in the list of makes as required by Owner/PMC. Approval of these samples shall be sought prior to commencement of any work. The source of materials specified in the tender shall be authenticated by the Contractor at the procurement stage. Owner/PMC reserve the right to enquire about any material used at site directly from the manufacturer/ Dealer specified in the tender.

A) FOR INTERIOR WORKS :

Material Make	
FLOORING	
Laminated Wooden Flooring	Pergo / Armstrong or as approved
PAINT	
Paint	ICI/ Asian /Berger or as approved
WALL PANELING	
Board /Ply	Merino / Green/ /Duro or equivalent ISI approved
Veneer	Merino /Green/ Duro or equivalent ISI approved
Laminate	Merino / Greenlam / Sunmica
Partical Board	Cellotex /sitatex or as approved
MDF Board	Duratuff/ Green/ Nuwood or as approved
Perforated Gypsum Tiles	Armstrong/ Gypro (Saint Gobain) or as approved
Aluminum	Jindal/Hindalco or as approved
Hardware	Ozone/ Haffele / Dorma/ Hettich
Glass	Modi Float /Asahi
Fabric	As / selection
Chairs	Geeken / Godrej or as approved
Acoustic Ceiling tile	Armstrong / Ecophone or as approved
Gypsum board	Gypsum India(Saint Gobain) /Lagyp/ Boral

B) ELECTRICAL WORK :

1.	Main/Sub Distribution Boards	– Kaniska Power Control - Milestones Swtichgears (P) Ltd. - Electra Power Pvt. Ltd. – Krypton Power Control (I) Pvt. Ltd. – Nitya Electro Controls – Impact Electric Controls Pvt. Ltd. – Control Wel
2.	Distribution Boards with Miniature Circuit Breakers, ELCB.	– Schneider – Legrand – Hager (L & T)
3.	Moulded Case Circuit Breaker	– L & T – Schneider – Legrand (DPX Range)
4.	Contactors, Timers, HRC Fuses Fuse Fittings & Indicating Lamps	– L & T – Siemens Telemechanic
5.	Voltmeter & Ammeter, Selector Switch, Current Transformer & Indicating Lights	– AE – MECO – Rishline (L & T) – G & M – Kaycee – Vaishno
6	PVC Conduit & Accessories	– SG Controls & Switchgear – BEC – AKG – Polypack
7.	Modular type Light & Power Accessories (Switches, Socket etc.) M.S. Switch Boxes.	– Legrand (Mosaic) – M.K. Electric (Wraparound) - Anchor Roma - North West
8.	PVC insulated copper conductor single core Multi stranded Fire Retardant (FR) wires of 1100volt grade	– Finolex – Kalinga – Skytone - Bonton
9.	Cat 6 UTP Cable	– D-link - Systemix - Legrand – Tyco
10.	Telephone Wire	– Skytone – Bonton – Proflex
11.	L.T. Cable, 1.1 KV grade XLPE Insulated Armoured Cable. Aluminium & Copper Conductor	– Kalinga – Skyton – KEI
13.	Cable Gland & Lugs	– Dowells – Multi – Jainsons – Lapp Kabel
14.	HDMI PORT	– Legrand – M.K. Electric
15.	<u>Light Fixtures</u>	
a)	Fluorescent Light Fixtures	– Philips/Wipro
b)	CFL Light Fixtures	– Philips/Wipro

c) Lamps – Philips
– Osram
– Sylvannia

d) Dimming Panel – Wipro
– Legrand
– M.K. Electric

C) HVAC WORK :

Items	Acceptable Makes
Split Unit Air conditioners HRV Units	Hitachi / Daikin/ Voltas/ LG/ Toshiba/ Mitsubishi/ VTS
Inline Fan	Systemair / Ostberg / Kruger
Drain Piping	Prakash Surya / Polypack
Ducting	
G.I. Sheet Metal Ducting (Rectangular)	Tata / Jindal / Sail
Insulation	UP Twiga/ Owen Corning/ Insuflex / Eurobatech
Duct Acoustic Lining	Up Twiga / Owen Corning
Grilles/Diffusers	Sarvex / Dynacraft / Ravistar / Mapro
Gravity Louvers	Sarvex / Dynacraft / Ravistar / Mapro
Refrigerant Piping with Cabling & Earthing	Mandev / Rajco/ Shrishyam Pipes

D) AUDIO VISUAL WORKS.

1)	Display Output			
a)	LED Panel 55"(With Mounting Bracket)	Samsung	Pansonic	Sony
b)	LED Panel 46" LED Panel (With Mounting Bracket)	Samsung	Pansonic	Sony
c)	Projector	Epson	NEC	LG
d)	Projector Screen 100" diagonal (5'x7')	Liberty	Draper	Elite
2)	VIDEO CONFERENCING (with 4 port MCU)	Life-size	Polycom	Cisco
3)	AUDIO INPUT	AKG	Shure	Bosch
		AKG	Shure	Bosch
4)	AUDIO PROCESSING			
a)	12 Analog inputs 8 ouputs fault Tolerent bus.	Biamp	Clearone	BSS

					81
a)	Amplifier 8 Channel Amplifier, 125 W per channel @ 8 ohms.	Biamp	Crown	Yamaha	
b)	Ceiling mount speakers 15 watt speaker.	JBL	Extron	Bosch	
7)	SWITCHER AND INTERFACE				
a)	VGA Distribution Amplifier one input 6 output VGA distribution Amplifier.	Extron	Kramer	AMX	
b)	Switcher 4input 1 output VGA and audio Switcher.	Extron	Kramer	AMX	
d)	Cable Cubby one female 15-pin HD connectpr,2 RJ45(Cat 6)Network, data connectors 1 audio input,Ac outlet.	Extron	Kramer	Magnum	

The quoted rate for each item of work shall include for the following irrespective whether it has been mentioned or not in the description of the item without any extra cost.

1. The Tenderers shall visit the site and shall satisfy himself as to conditions under which the work is to be performed. They shall also check ascertain the location of any existing structures or equipment or any other situation, which may affect the work. No extra claim as a consequence of ignorance or on ground of insufficient description will be allowed at a later date.

2. Owner reserves the right to accept the whole or any part of the tender received and the tenderer shall be bound to perform the same at the quoted rate.

3. The Owner reserves the right to remove any part of the work from the scope of the Contractor and place the orders directly. The Contractor should quote keeping this in view.

4. The contractor is required to coordinate his work along with other agencies working at site. He has to make good any damage made by him or any of his representatives to the works of any other agency or Owner at site.

5. The basic rate of some materials is given in schedule of quantities for respective items. The difference in basic rate after approval of samples shall be adjusted accordingly. The base rate of any material mentioned in the schedule of quantities is inclusive of sales tax/VAT, forwarding and cartage.

6. Unless otherwise provided in the description of various items of the work. The rates tendered by the contractor shall be for complete items of work covering all materials, labour, carriage, royalties, fees , rents, sales tax, VAT, octroi, wastage, tools, plant, equipments, transport, temporary constructions over head charges and profits as well as general liabilities, obligations and risk arising out of the conditions of contract and carrying the work in part (s) or complete, cables/drains/along pipes etc and shall apply to all heights, depths, leads and lifts. No extra charges whatsoever on any consequent misunderstanding or otherwise shall be allowed.

7. All items to be installed/provided in position. The quantities are approximate and this is to be checked and measured at the work site and paid accordingly.

8. The quoted price for items shall include all accessories, consumables, spares etc, as required to make the item complete in all respects, compatible with other related/associated items and fully functional.

9. Loading, transporting, unloading, handling/double handling, hoisting to all levels, setting, fitting and fixing in position, cleaning, disposal of debris and other labour necessary in and for the full and entire execution and to fully complete the job in accordance with the contract documents, good practice and recognized principles shall be responsibility of the contractor.

10. The contractor shall remove all surplus materials debr waste materials etc. and clean the areas while working and after completion.

11. Please refer the drawings for dimensions, sizes etc. wherever not specified in the schedule of quantities and quote accordingly.

12. Any sub standard materials used during execution will be rejected and the Contractor shall replace the same to the entire satisfaction or the Owner/PMCs at his own cost.

13. The contractor shall sign all the pages of the tender documents including drawings.

14. The contractor is required to fabricate one or more samples / mock ups of each items as instructed for approval. Any minor changes in the samples to the specifications as mentioned in the tender shall not be deducted or paid extra. The bulk production of the furniture can only be taken in nd after the final approval of sample of each item. The sample of each item must be got approved with in two weeks of the date of order / commencement. It shall be the entire responsibility of the contractor to get the sample approved by the Owner/PMC spending the minimum time and no extension of time shall be granted for getting the late approval of the samples.

15. Any damage caused to the executing the work including the contractor while executing the work shall be made good by the contractor at his own cost.

16. Contractor, whenever asked shall submit basic unit rates for all constituent materials of a particular item. These rates

shall be for analysis of substituted items in case of additions or deductions.

17. The Quantities of items given in the schedule of quantities are provisional. The Contractor shall be paid for the actual quantity of work measured at the site at the rates agreed. The Owner reserves the right to increase or decrease any of the quantity or to omit totally any item of work through their Consultants. Any claim by the Contractor on these accounts will not be entertained.

18. All the items of work given in the schedule of quantities shall be executed strictly in accordance with the relevant drawings and specifications.

19. In the event of conflict between Schedule of Quantities and other documents including the Specifications, the most stringent condition shall apply and interpretation of the Owner/PMC shall be final and binding.

20. Any error in description of quantity, or omission of items from this Schedule shall not vitiate this Contract but shall be corrected and deemed to be a variation required by the Owner.

21. The specification for items not covered in this specification, schedule of quantity, specified standards and rules shall be followed as per IS Specifications.

The method of measurement of various items shall be as follows:

Partitions shall be measured by the face area of the panel. The area of fixed glazing and doors shall be deducted and paid for separately under the respective heads.
Partition panels shall be measured on both sides of the partitions
Storage cabinet shall be measured by the face area
Tables shall be measured by the top area
Side tables shall be measured by the top area
Rear credenza shall be measured by the face area
Side units shall be measured by the face area.

22. All unexposed surfaces of wood (any variety /wood substitute/ boards/ply etc used shall be treated with necessary coats of anti termite treatment of approved make.

23. All M.S. framework shall be applied with approved anti corrosive treatment.

24. All exposed surfaces of wood any variety/wood substitute/particle boards/ply etc. shall also have necessary coat of primer/putty and melamine polish.

25. All unexposed surfaces of wood/particle board/Ply (any variety) used shall be treated with Synthetic Enamel Paint of approved make & shade.

26. All exposed edges of wood/particle board/Ply (any variety) used shall be finished with 4 mm thick wood lipping unless otherwise specified.

27. Thickness of laminate used shall be 1.5 mm, teak veneer/ply used shall be 4 mm and that of plywood and block board shall be 6 mm, 12 mm & 19 mm as specified.

28. The tolerance in the thickness of the laminate shall not be more than +/- 0.1 mm.

29. All furniture bases shall be provided with nylon glides for even distribution of load, designed and shaped to minimize wear and tear of carpet.

30. Sample of all moulding /edging/beadings shall be got approved by the Owner/PMC/ Owner/PMCs before execution.

31. All hardwares shall function smoothly without any friction or crack when fixed in position. The approved samples shall be in custody of the Owner/PMCs for checking the correctness of materials procured in comparison with approved sample.

32. For Electrical works, the contractor shall provide the following drawings for approval to Consultants before commencement of supply/fabrication.

34.1 Distribution Boards/Panels:
- (i) General layout-Plan, section, elevations
- (ii) Foundation/Fixing arrangement.
- (iii) Wiring-Power & Control

34.2 Internal & External Electrification System:
- (i) Cable Lay-out

(ii) Conduit Lay-out
(iii) Number and size of wires in each conduit.
(iv) Location of earth pits.

34.3 Bus Trunking System:
(i) General layout-Plan, section, elevations
(ii) Conductor Details.

34.4 After completion of the work the contractor shall submit one original on R.T.F & three prints of as built drawings along with floppy disc/s containing the same before the certificate of completion is issued to him. These drawing would include;

a) The location of all the equipment supplied & erected by the contractor.
b) Cable and conduit routes clearly indicating the sizes & number of cables.
c) Earthing layout - indicating the type of earth station & size of earth conductor.
d) Wiring diagram of Panels.
e) Bus trunking route clearing indicating the sign and rating of the duct.
f) Complete single line diagram for Normal and Emergency supplies.
g) Any other information the Consultants may deem fit.

NOTE : ALL RATES QUOTED BY THE CONTRACTOR ARE INCLUSIVE OF AL XES, CENTRAL SALES TAX, VALUE ADDED TAX (VAT), WORK CONTRACT TAX, CESS AS PER BUILDING & OTHER CONSTRUCTION WELFARE CESS ACT. OR ANY STATUTORY TAX APPLICABLE. HOWEVER SERVICE TAX SHALL BE PAID EXTRA AS PER PREVAILING NORMS OF GOVT. OF INDIA.

B

O

Q

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

ABSTRACT OF COST

Sl. NO.	Description of the items	Total quoted amount in figure	Total quoted amount in word
1	INTERIOR WORKS ANNEXURE-A		
2	FURNITURE WORKS ANNEXURE-B		
3	ALLIED CIVIL WORKS ANNEXURE-C		
4	AIRCONDITIONING WORKS ANNEXURE-D		
5	ELECTRICAL WORKS ANNEXURE-E		
6	AUDIO VISUAL WORKS ANNEXURE-F		
	TOTAL		
	Add Service Tax		
	Total quoted amount including service tax		

Total quoted amount in words.....

Signature of the Contractors

Note: Service Tax will be paid on production of valid paid service tax Challan to service tax authority.

Signature of the Contractors

ANNEXURE-A

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

INTERIOR WORKS

Sl. No.	Item Description	Qty	Unit	Rate	Amount
1	Providing and laying floor of 19 mm thick. Black	7.00	sqm		
2	Providing and laying 9mm thick Original laminate flooring - class of use 33, wear resistance AC-5, Impact resistance- IC 3 (as per EN 13329), Top surface having a high pressure laminate and treated with (aluminum oxide) surface guard and of Plank Size 94mmx194mm having smart lock tongue and groove joints to secure long lasting joint. The edges of tongues and groove of planks duly pre-impregated	171.00	sqm		
3	Providing and laying threshold of 19 mm thick. Black granite tapered in required shape with exposed edges polished. The threshold shall be placed at transition point between two type of flooring with different levels as required. The threshold shall be fixed either with cement mortor or with resin based adhesive "araldite" as required.	4.00	rmt		
4	Wooden boxing for stage flooring & ramp including providing & fixing specified wood frame work consisting of battens 50X50 mm fixed with rawl plug & drilling necessary holes for rawl plug etc including priming coat. Also including providing & fixing of 19 mm thick Ply wood of approved make cutting & fixing in position with screws etc complete.	91.00	sqm		
	FALSE CEILING				
5	Providing and fixing false ceiling of 12.5 mm thick tapered edge Gypsum board of India Gypsum	51.00	sqm		
6	Item same as above (2.01) but Extra for cove	49.00	sqm		
7	Material and Labour for providing Plastic Emulsion paint on ceiling surface of desired colour and shade in two or more coats over newly prepared ceiling surface with application of sponge roller to given an even finish to the ceiling.	61.00	sqm		
8	Providing & fixing one side laminated trap doors	10.00	sqm		
9	Providing and Fixing Acoustic tiles having square edge Glass-Wool acoustic ceiling in size 600 x 600 x 20mm having noise reduction co-efficient of 0.90, light reflectance 3% and humidity resistance	164.00	sqm		

	of 95% at 30*C. The weight of the system with the tile should be approx. 4 kg/m2 and the tile should have class A absorption. Tiles to be laid on suspended pre-finished ceiling grid incl. proprietary suspension system, pre finished framing, edge trims and other accessories of 24mm grid type.				
10	Providing and Fixing Wooden false Ceiling comprising of a hardwood frame of section size 50 x 50 covered with 12 mm thick commercial plywood and finished with a natural Wenge wood veneer of 3.5 mm thickness duly lacquer polished in matt finish. The ceiling shall be secured to the roof soffit with adequate suspenders. The item shall be inclusive of cutting & making cutouts for lights, difffusers etc all	96.00	sqm		
	WALL FINISHES				
11	Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	101.00	Sqm		
12	Providing and Fixing wall paneling with a combination of 3.5 mm thick. Steam Beach natural wood veneer and 1.0 mm thk laminate and fabric (upto Rs. 350/- per rm. cost) finished as per design with vertical grooves of 9 x 9 mm between two panels fixed over a base frame consisting of a kailwood framework of 50 x 50 mm section size at avg. 2'-0" x 2"-0" c/c vertically and horizontally covered with a layer of 12 mm thick plywood of approved make. The exposed edges of the panel shall have 4 mm thick Steam Beach wood margin finished smooth and spirit polished alongwith the exposed portion of base framework in approved shade including all necessary hardware etc. including spirit polish and matt finish lacquer coating over veneer and wood sections	96.00	sqm		
13	Providing and Fixing wall paneling as per specification in 3.02 with acoustic insulation in	96.00	sqm		
14	Providing and Fixing Steam Beech wood paneling top rail of section size 75mm x 20mm Shaped as per specifications	32.00	rmt		
15	Providing and Fixing panels of 12 mm perforated gypsum tile with fabric (upto Rs. 350/- per rm.) covering fixed over 6 mm plywood framing over a base frame consisting of a kailwood framework of 50 x 50 mm section size at avg. 2'-0" x 2"-0" c/c vertically and horizontally complete with all necessary	150.00	sqm		
16	Providing and Fixing Particle board pin up panels on walls made of 12 mm thk. Cellotex board	10.00	sqm		
17	providing & fixing 6 mm thick toughened glass shutters for pin up board including magnet catchers, nobs hinges etc complete	10.00	sqm		
18	Providing and Fixing 150 mm * 150mm wide	30.00	Rmt		

	pelmet of 19 mm thick ply board for false ceiling including all necessary fittings required etc complete				
19	Providing and Fixing wooden ledge (below TV units) of section size 300 mm x 56 mm made out of 18 mm MDF board cold pressed with 3.5 mm thk natural veneer shaped as per the design and fixed with adequate hardware as per design, duly spirit polished in approved shade and melamine coated.	7.00	Rmt		
20	Wall painting with premium acrylic emulsion paint of interior grade of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour	95.00	Sqm		
	DOOR WINDOWS AND COVERINGS				
21	Providing & Fixing full length velvet drapery curtains stitched as per required design & shape to give a faultless fall & crease and lined with mark line on the side facing the window including providing & fixing all necessary accessories like C-channel, manual curtain track system, rings, bearings etc all	36.00	Sqm		
22	Making and Fixing Steam Beech wood SR (sound resistant) doors	5.00	sqm.		
23	Making and Fixing of Steam beach wood door frames of section size 50 x 125 or 40x100 mm in profile	7.00	rmt		
24	Providing and Fixing box type hydraulic door closer of approved make with aluminum die cast body with rack and pinion of alloy steel and neoprene high density PVC 'O' rings. Heavy duty door closer	2.00	nos.		
25	300 mm Satin chrome finish handles of 25mm dia	4.00	Set		
26	SS Lever handle with cylindrical dead lock	2.00	nos		
27	Heavy duty floor spring	2.00	nos.		
28	Providing and fixing Tower bolt SS Size 150 mm	2.00	nos.		
29	Providing and fixing anodized/ powder coated of approved shade aluminum work for doors, windows, ventilators and partitions with extruded built up standard tubular and other section of approved make conforming to IS :733 and IS: 1285, anodized transparent or dyed to required shade according to IS: 1868 (Minimum anodic coating of grade AC 15) or alternatively podwer coated with pure polyester powder of approved shade and make to thickness not less than 60 microns, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up of gaps at junctions, at top, bottom and sides with required EPDM gasket, silicon sealant etc as required. Aluminium section shall be smooth, rust free, straight, mitred, and jointed mechanically whenever required including cleat angle, Aluminium snap beading				

	for glazing /panneling , C. P. brass stainless steel screws, all complete as per architectural drawings and as directed. The rates should include cost of all stainless steel hardware, handles, hinges & locks.				
29(a)	For fixed portion including EPDM gaskets etc. complete (excluding glass, to be paid separately)	246.00	Kgs		
29(b)	For shutters of windows, doors and ventilators including providing and fixing approved hinges, all hardware & fittings whenever required including the cost of EPDM gasket, (excluding glass, to be paid	295.00	Kgs		
30	Providing & Fixing Toughened Clear Glass panels in partitions including providing necessary rubber beading as per design in duly finished & in existing Aluminum sections of following thickness 6 mm thick glass	36.00	Sqm.		
	TOTAL QUOTED AMOUN T FOR ANNEXURE=A				

TOTAL QUOTED AMOUNT IN WORDS……

SIGNATURE OF THE CONTRACTORS……

ANNEXURE-B

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

FURNITURE WORKS

Sl. No.	Item Description	Qty	Unit	Rate	Amount
1	Making & Fixing 600 mm deep storage cabinets with Steam Beech wood shutters (louvre shutters)	12.00	sqm.		
2	Making & Fixing 450 mm. deep Rear Credenza / Side unit type 'A'	3.00	sqm		
3	Making and Fixing 450 mm. deep planters Type made out of 19 mm. thick. block board	3.00	sqm		
	LOOSE FURNITURE				
4	Making and Placing in position Conference/ Stage tables in shape and profile as per design in segmental length seating persons as required.	38.00	sqm		
5	Making & Fixing Lecture stand	1.00	nos.		
	Stage Chairs				
6	A Providing & Placing in position Officer chair 'A' with high back	3.00	Nos		
7	Conference room chair medium back chair, PP adjustable arms, chrome base, gas lift, net back, seat fabric tapestry, synchro tilt mechanism	59.00	nos.		
8	Conference room chair with fixed base, folding writing board, pipe stand, seat back fabric tapestry, powder coated.	12.00	nos.		
	TOTAL QUOTED AMOUN T FOR ANNEXURE-B				

TOTAL QUOTED AMOUNT IN WORDS.....

SIGNATURE OF THE CONTRACTORS.....

ANNEXURE-C

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

ALLIED CIVIL WORKS

Sl. No.	Item Description	Qty	Unit	Rate	Amount
1	1 Dismantling and disposal of wooden partitions & Panelling including removal of panels from wall without making damage to wall & internal electrical conduits & disposal to suitable site etc complete	193.00	sqm		
2	Dismantling and disposal of the Existing carpet flooring including removal of carpet without damaging the floor & disposal to suitable site etc complete	188.00	sqm		
3	Dismantling and disposal of the Existing wooden ceiling including removal of all services like electrical fittings, wiring, etc complete & disposal to suitable site etc complete	188.00	sqm		
4	Repairing of Existing Windows including replacement of door hinges, tower bolt, handles etc complete if required & painting/polishing as per the requirement	7.00	nos.		
5	Dismantling work and disposal of Electrical & fire fighting fittings, wiring & fixtures from ceiling & walls & disposal to suitable site etc complete.	1.00	Job		
6	Dismantling work of Audio visual system including removal of fitting & storage at suitable place for reuse if required & disposal of wiring at suitable place etc complete	1.00	Job		
7	Dismantling work of M.S door frame including cutting, removal of MS frame/grills & making door opening suitable for new door installation. Also includes removal of existing door etc complete.	1.00	Job		
8	Dismantling work of H.V.A.C system including removal of AC's, duct, piping wiring etc & storage of usable material for reuse & disposal of non usable material at suitable site etc complete.	1.00	Job		
9	9 Dismantling of Existing wooden stage including removal of wooden planks & disposal at suitable site including etc complete.	1.00	Job		
10	Dismantling & removal of existing furniture's, tables chairs, storage cabinets etc including storage of usable material & disposal of non usable material to suitable site etc complete.	1.00	Job		
	TOTAL QUOTED AMOUN T FOR ANNEXURE-C				

TOTAL QUOTED AMOUNT IN WORDS.....

SIGNATURE OF THE CONTRACTORS.....

ANNEXURE-D

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

SCHEDULE OF QUANTITIES FOR HVAC WORK AT THE CONFERENCE ROOM OF ICMR, NEW DELHI.

AIRCONDITIONING WORKS

SL. NO.	ITEM DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Split Unit Air conditioners				
	Cassette Split Unit				
1	Providing, fixing, testing and commissioning of cassette split unit air conditioners with evaporator with fan with motor, cooling coil, filter, decorative ceiling grill/panel condenser with hermetically sealed scroll compressor, condenser coil, propeller fan with motor, M.S. stand for DDU control panel with cabling & earthling, corded remote control, filters complete as per standards, requirement and drawings (a) 3.0 tons capacity	6.00	Nos		
	HRV UNIT				
2	Supply, installation, testing & commissioning of heat reclaim ventilation unit with inlet and exhaust blower with fan (Inlet & exhaust) heat exchanger, desiccant absorption material noncontact seal, modular design with Aluminum supports of extruded section, galvanized steel plate casing, self extinguishable polyurethane foam insulation, multidirectional fibrous fleeces air filter complete with electrical panel and corded remote with cabling and earthling complete as per requirements. 650 CMH	2.00	nos		
	Drain Piping				
3	Rigid PVC piping complete with fittings, supports as per specifications and duly insulated with 6 mm thick closed cell nitrile rubber insulation				
3(a)	40 mm dia	45	Rm		
3(b)	32 mm dia	20	Rm		
3(c)	20 mm dia	20	Rm		
	Ducting				
4	Sheet metal ducting complete with supports dampers etc. as per specifications & drawings.				
	G.I. Sheet Metal Ducting				
	0.63 mm (24 Ga)	30	Sqm		
	INSULATIONS				
5	Providing and fixing nitrile rubber insulation on ducts				

	complete as per specifications and drawings				
	9 mm thick	30	Sqm		
	Diffusers				
6	Providing and fixing of supply and return air diffusers as per specifications and drawings including fixing frame in false ceiling/walls.				
	Return diffuser without damper.	1.50	Nos		
	Volume Control Damper				
7	Providing and fixing G.I. volume control damper with blades, adjustable lever, frame etc. as per specifications and drawings	0.60	Sqm		
	Flexible Duct				
8	Providing and fixing of Aluminium wired flexible insulated duct complete as per specifications and drawings.				
	200 mm dia	10	Rm		
	Refrigerant Piping with Cabling and Earthing				
9	3.0 TR Cassette	90	Rm		
	Earthing				
10	Double earthing continuity conductors of G.S.S between panel boards and equipments as required and interlocking of smoke extraction and pressurization fans with fire panel	1	L.s		
	Under Desk Insulation				
11	Providing and fixing of glass wool insulation of 16Kg/cum-50mm with 50mm flange suitably fixed along with vapour barrier with RCC ceiling and walls complete as required.	160	Sqm		
	TOTAL AMOUNT				

TOTAL QUOTED AMOUNT IN WORDS..... .....

SIGNATURE OF THE CONTRACTORS.....

Note:
The prices are to be quoted for the above mentioned works shall include the supply, installation, testing and commissioning at site of all the equipments, ancillary materials as specified and all such items what so ever which may be required to fulfill the intent and purpose as laid down in the specification and/or the drawings.

SIGNATURE OF THE CONTRACTOR

ANNEXURE-E

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

ELECTRICAL WORKS

SUB DISTRIBUTION BOARDS, DISTRIBUTION BOARDS & VERTICAL DISTRIBUTION BOARDS

S. NO.	ITEM DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	SUB DISTRIBUTION BOARDS				
	Supply, installation, testing and commissioning of cubicle type Sub Distribution Board totally enclosed free standing type, duly compartmentalized, dust free, damp and vermin proof fabricated from 2mm thick CRCA sheet steel duly powder coated painted, internally wired, interconnection with aluminium links, busbar chamber and having following incoming & outgoing moulded case circuit breakers, ammeters, voltmeters, selector switch, indicating lamps etc. complete as per specifications and drawings.				
	SDB PANEL				
	INCOMER				
	1 No. 125Amp four pole moulded case circuit breaker (35KA Ics Value)				
	INSTRUMENTS				
	1 No. 0 to 500 Volt Digital voltmeter with selector switch				
	1 No. 0 to 125 Amp Digital Ammeter with selector switch and CT's				
	3 Nos. of phase indicating lamps with protection MCB.				
	1 Nos. of ON / OFF indicating lamps with protection MCB.				
	BUSBARS				
	200Amp TPN busbars of aluminium alloy.				
	OUTGOING				
	2 No. 100 Amp triple pole moulded case circuit breaker with neutral link (25KA Ics Value)				
	2 No. 40 Amp triple pole moulded case circuit breaker with neutral link (25KA Ics Value)				

	1 No. 40 Amp double pole miniature circuit breaker 10KA	1.00	Set		
2	DISTRIBUTION BOARDS				
	Supply, installation, testing & commissioning of following surface/ recess type tripple pole and neutral Distribution Board (double door type) with loose wire box, incoming MCB, RCCB and outgoing single pole miniature circuit breakers, bus bar, earth bar, complete as per specifications.				
	DISTRIBUTION BOARD -(8 WAY TPN)				
	INCOMER				
	1 No. 40Amp TPN MCB with 3 No. 40Amp double pole RCCB of 30mA sensitivity.				
	BUSBARS				
	100Amp TPN copper busbars.				
	OUTGOING				
	18 Nos. 6 to 32 Amp single pole miniature circuit breaker	(10 KA).	1.00 Set		
	DISTRIBUTION BOARD -(12 WAY SPN)				
	INCOMING				
	1 No. 40Amp double pole MCB with 40Amp double pole earth leakage circuit breaker of 30mA sensitivity.				
	BUSBARS				
	100Amp SPN copper busbars (Two Strip).				
	OUTGOING				
	8 Nos. 6 to 32 Amp single pole miniature circuit breaker.	1.00	Set		
3	VERTICAL DISTRIBUTION BOARDS				
	Supply, installation, testing & commissioning of following surface/ recess type triple/single pole and Vertical Distribution Board (Double door type) with loose wire box with incoming MCCB/MCB and outgoing MCB complete with busbar, complete as per specification and as required				
	VDB/AC (8 WAY VTPN DB)				
	INCOMER				
	1 No. 100Amp four pole moulded case circuit breaker (25KA Ics Value) .				
	BUSBARS				
	150Amp TPN copper busbars. OUTGOING 7 Nos. 32Amp triple pole miniature circuit breaker (10 KA) with neutral link. 3 Nos. 16Amp single pole miniature circuit breaker (10 KA) with neutral link.	1.00	Set		
4	MAIN & SUB MAIN CABLES				
	Supply & wiring for sub main wiring with				

	earth wiring with following sizes of Fire Retardant (FR)PVC insulated cooper conductor single core cable in surface/recessed PVC conduit including accessories painting, as required. 4 x 16 Sq.mm. + 2 x 16 Sq.mm. (earth wire)	20.00	M		
	2 x 10 Sq.mm. + 1 x 10 Sq.mm. (earth wire)	20.00	M		
	2 x 2.5 Sq.mm. + 1 x 2.5. Sq.mm. (earthwire)	40.00	M		
5	Supply of following size of 1.1 KV grade multicore aluminum conductor PVC insulated & PVC sheathed armored cable.				
	3.5 core, 70 Sq.mm.	30.00	M		
	3.5 core, 35 Sq.mm.	10.00	M		
	4 core, 6 Sq.mm.	120.00	M		
6	Laying and fixing of following sizes of one number XLPE cable of 1.1kv grade on surface or existing cable tray etc. as required. Size not exceeding 25 Sq.mm.	120.00	M		
	Size exceeding 25 Sq.mm. but not exceeding 120 Sq mm.	40.00	M		
7	Supply & making end termination with brass compression gland & aluminum lugs for following size of PVC insulated and PVC sheathed / XLPE aluminum conductor cable of 1.1KV grade as required.				
A	3.5 core, 70 Sq.mm.	2.00	Set		
B	3.5 core, 35 Sq.mm.	2.00	Set		
c	4 core, 6 Sq.mm.	12.00	Set		
8	III. POINT WIRING				
	Supply and wiring of following light/exhaust point with 1.5sq.mm PVC insulated multistranded copper conductor cable (FR) Type in surface/recess PVC conduit including accessories painting, cutting the chases in wall & making good the same, including providing & fixing of M.S. switch box, modular range of plate switches, modular cover plate, ceiling rose, circuit wiring with 2.5 sq.mm. & earth wiring with 1.5 sq.mm. PVC insulated copper conductor cable / wire (FR) Type etc. complete as required & as				
a	Single / first point.	6 .00	Pt.		
b	Looping point.	8 6.00	Pt.		
9	Supply & wiring of general power point with 4.0 sq.mm PVC insulated multistranded copper conductor cable				

	(FR) Type in surface / recess PVC conduit including accessories painting, cutting the chases in wall & making good the same including providing & fixing of M.S. Switch & outlet box, modular range 16Amp switch with 6 pin 16/6Amp socket, modular cover plate, earthing with 4 sq.mm PVC insulated copper conductor cable / wire (FR) Type etc. complete as required & as per	3 .00	Pt.		
10	Supply and wiring of UPS outlet point with 2.5Sq.mm PVC insulated stranded copper conductor cable (FR) Type in recessed/surface PVC conduit including accessories painting, cutting the chases in wall and making good the same, including providing & fixing MS switch box, modular 3 No. 6 Amp 3 Pin socket outlet with 16Amp S.P. switch, modular cover plate, circuit wiring, 2.5 sq.mm. PVC insulated copper earth wire (FR) Type etc. complete as required and as per specifications.				
a	Single / first point.	7 .00.	Pt		
b	Loop point.	2 .00	Pt.		
	DIMMING PANEL & LIGHT FIXTURES				
11	Supply Installation, Testing & Commissioning of wall mounted lighting dimming panel complete with 1 no. infra red remote control , 1-10V module for CFL / TFL dimming circuit and other accessories complete as required.	1.00	No		

12	Supply Installation, Testing & Commissioning of 2 x 18W recess mounted CFL down lighter with satin finish reflector, electronic ballast, and other accessories complete with all accessories as required	38.00.	No		
13	Supply Installation, Testing & Commissioning of 2 x 18W recess mounted CFL down lighter with satin finish reflector, dimmable ballast, and other accessories complete with all accessories as required	24.00	No.		
14	Supply Installation, Testing & Commissioning of 12V, 50 watt halogen recess mounted light fixture with electronic transformer complete with all accessories as required	12.00	No.		
15	Supply Installation, Testing & Commissioning of 1 x 28 watt box type T-5 fluorescent lamp dimmable ballast light fixture complete with T-5 lamp, Connecting terminal complete. as required.	18.00	No		
	NOTE : ALL LIGHT FIXTURES TO BE QUOTED INCLUSIVE OF LAMPS.				
	CONDUITING & WIRING FOR DATA NETWORKING & TELEPHONE SYSTEM				
16	Supply, installation, testing & commissioning of following cables. 23 AWG UTP Data Cable (Cat 6) Giga speed in the existing conduit/ under floor trunking	250.00	M		
17	Supply, installation, testing & commissioning of High Defination Multimedia Interface (HDMI) Port fixed in GI box and recessed in wall or furniture complete as required.	10.00	No.		
18	Supply, installation, testing & commissioning of following RJ-45 connectivity. Duplex Faceplate with 2 No. RJ-45, information outlet with shutter compliant to TIA 568A/B with colour coding.	6.00	No		

19	Supplying and fixing following size / modules, GI box along with modular base & cover plate for modular switches in recess etc. as required. 1 or 2 Module (75mm x 75mm) .	4.00	No		
20	Supply & fixing of following sizes of PVC conduit in recess / surface including accessories painting, along with the accessories including cutting the wall & making good the same in case of recessed conduit etc. as required. 25 mm dia	200.00	M		
21	Supplying and fixing of following modular switch / socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required. Telephone socket outlet (RJ -11)	1.00	No.		
22	Supplying and drawing following pair, 0.5 sq.mm FR PVC insulated copper conductor, unarmored telephone cable in the existing surface / recessed steel / PVC conduit as required. 2 Pair	50.00	M.		
23	Supply, installation, testing & commissioning of following Jack Panel. 12 Port CAT 6 Jack Panel.	12.00	Nos.		
24	Supply & Installation of Mounting Cord	12.00	Nos		
25	Supply & Installation of Hub	1.00	No.		
	EARTHING				
26	Earthing with tinned GI earth plate 600mm x 600mm x 6mm thick including accessories complete with providing charcoal, salt, watering pipe etc. including making of masonry brick chamber with precast RCC frame & cover etc. complete as required as per drawings and specification.	2 .00	Set		

27	Providing and fixing following sizes copper/GI strip in GI pipe from earth electrode as required. 25mm x 5mm GI strip.	50.00	M		
28	Supply of 40mm dia GI Pipe in ground including excavation as required.	10.00	M		
	TOTAL AMOUNT				

TOTAL QUOTED AMOUNT IN WORDS..... .....

SIGNATURE OF THE CONTRACTORS.....

ANNEXURE-F

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED
(A Govt. of India Enterprise)
CRPF UNIT, PLOT NO.8, VASANT KUNJ PH-II, NEW DELHI -110070

AUDIO VISUAL WORKS

SCHEDULE OF QUANTITIES FOR AUDIO VISUAL WORK AT THE CONFERENCE ROOM OF ICMR, NEW DELHI.

S. NO.	ITEM DESCRIPTION	QTY	UNIT	Rate	Amount
	SUPPLY OF:				
	Display Output(options for 46 inch LCD /55 INCH LED)				
1	55 inch LED TV Full HD resolution with 3d Hyper ready engine	1.00	nos		
2	46 Inch LCD TV Full HD resolution Model	4.00	nos		
3	Projector 4000 Lumens ,XGA resolution (1024x768) resolution Wireless ready projector 2000:1 Contrast ratio	1.00	nos		
4	Projector Screen 100" diagonal (5'x7') Matt White Motorized Screen with Switch	1.00	nos		
5	RF Remote with External Receiver for Motorized Screen	1.00	nos		
6	Projector ceiling mount kit	1.00	job		
	VIDEO CONFERENCING ENDPOINT				
7	Video Conferencing System - Video Quality Full HD Standards-based 1920x1080 - 30fps1280x720 - 60fps Supports 2 HD Monitors , With Camera 10x Supports two HD PTZ Camera External Audio Audio 7 in 4 out Video Output 3 in 2 out Point to Point HD Video Communications Embedded 4 way Cp HD Multipoint.	1.00	nos		

	AUDIO INPUT				
8	Gooseneck Microphone. Rugged 50 cm gooseneck module, programmable mute switch (on/off), push-to-talk, push-to-mute),high RFI immunity, LED ring, XLR connector XLR connector with Screw-cardioids microphone capsule module.	29.00	nos		
9	Gooseneck Microphone for stage. Rugged 50 cm gooseneck module, programmable mute switch (on/off), push-to-talk, push-to-mute), high RFI immunity, LED ring, XLR connector XLR connector with Screw-hyper cardioids microphone capsule module.	5.00	nos		
10	Wireless Microphone Multi channel UHF Wireless Hand Held Microphone Set	2.00	nos		
11	Wireless Mike 30 MHz selection bandwidth (depending on local frequency plans) 8 hours of operation on a single AA size battery	2.00	nos		
	AUDIO PROCESSING				
12	BSS 12 Analog inputs 8 output fault Tolerent bus.	4.00	nos		
	AUDIO OUTPUT				
13	(a) Amplifier 8 Channel 125 watt per channel @ 8 Ohms.	1.00	nos		
	(b) Ceiling mount 15 watt speaker.	8.00	nos		
	PODIUM				
14	Powered podium	1.00	nos		
	SWITCHER AND INTERFACE				
15	VGA Distribution Amplifier One input 6 output VGA distribution Amplifier.	1.00	nos		
16	Switcher 4input 1 output VGA and audio Switcher.	1.00	nos		
17	Scaler HDMI to computer Graphics Video.	1.00	nos		
18	VGA Distribution Amplifier One input 2 output VGA distribution Amplifier.	1.00	nos		
19	Audio distribution Amplifier One Input 5 output audio distribution Amplifier.	1.00	nos		
20	Cable Cubby one female 15-pin HD connectpr,2 RJ45(Cat 6)Network, data connectors 1 audio input, Ac outlet.	4.00	nos		
21	Switcher - 2in 1 out VGA Switcher	1.00	nos		
	CONTROL SYSTEM				
22	Compact Control System with Ethernet includes PW-2420 RU Power Supply	1.00	No.		
23	IR Emitter Probe	2.00	Nos.		
24	IR Splitter	2.00	Nos.		
25	2-pin to Mini phone Cable (For connecting ST-SPL to MC2E)	2.00	Nos.		
26	I Pad with integrated software	1.00	No.		
27	Control Button Panel	1.00	No.		

	RACK BOX				
28	Rack box 20 U closed Rack with Castor wheels, Shelf PDU and Lock.	1.00	No.		
	INSTALLATION AND CABLING ALONG WITH AV CABLING				
29	Cables and Connectors High Quality VGA and Audio Cables and Connectors	1	Lot		
30	Installation commissioning testing programming and support	1.00	Lot		
	TOTAL AMOUNT				

TOTAL QUOTED AMOUNT IN WORDS……

SIGNATURE OF THE CONTRACTORS……