



# IIT Indore

NIT No. IITI/ES/PR/PEB-MH/NIT/2017-18/03

## **Name of Work**

**“CONSTRUCTION OF MULTIPURPOSE HALL (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)”ON DESIGN & BUILD BASIS AT IIT INDORE, SIMROL CAMPUS**

Superintending Engineer & Project in Charge,  
First Floor, PHY 02, POD 03,  
IIT Indore, Simrol campus,  
Khandwa Road, Simrol, Indore- 453522 (MP)

# **INDIAN INSTITUTE OF TECHNOLOGY INDORE**

NIT No. IITI/ES/PR/PEB-MH/NIT/2017-18/03

**NAME OF WORK-**“CONSTRUCTION OF MULTIPURPOSE HALL (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)” ON DESIGN & BUILD BASIS AT IIT INDORE, SIMROL CAMPUS

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## Notice Inviting Tender

Ref.: NIT No. IITI/ES/PR/PEB-MH/NIT/2017-18/03

Date.07/06/2017

1. Indian Institute of Technology Indore (IIT Indore) invites tender for the work of “CONSTRUCTION OF MULTIPURPOSE HALL (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)” ON DESIGN & BUILD BASIS AT IIT INDORE, SIMROL CAMPUS. Documents are to be submitted to the Superintending Engineer & Project in Charge, IIT Indore in four cover system (Lump sum) before the prescribed date and time.
2. Brief Details of work:-

Sl. No.	Name of work	Cost Of work (Rs)	Processing Fee (Non Refundable)	Earnest Money Deposit (Rs)	Completion Period	Last date and time of submission
01	02	03	04	05	06	07
1	“CONSTRUCTION OF MULTIPURPOSE HALL (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)” ON DESIGN & BUILD BASIS AT IIT INDORE, SIMROL CAMPUS	To be quoted by bidder	Rs. 3,000 (in the form of Demand Draft/Bankers Cheque From any Nationalized bank in favour of “Registrar, IIT Indore payable at Indore.)	10, 00,000/-.	150Days	June 27 , 2017 upto 3.00 pm

**Last date of receipt of Tender:** - June 27, 2017 up to 3.00pm

**Opening of technical bid:** - June 27, 2017 at 3.30pm

**Opening of Financial bid:** - The date and time shall be communicated to the tenderers who will qualify in technical evaluation

1. **Pre bid meeting:** - June 14 , 2017at 11am at IIT Indore Simrol campus
2. The tenders are to be submitted in the office of the Project In charge at PHY02, POD3 building, IIT Indore, Khandwa Road, Simrol Campus, Indore- 453552(MP).
3. Detailed NIT is available on the institute website <http://www.iiti.ac.in/tender.php>. The queries are to be sent to e-mail id: - [sangisapuj@iiti.ac.in](mailto:sangisapuj@iiti.ac.in) or Mobile no-09165258763 up to June 13, 2017.
4. **Time limit:** 150 days from 10<sup>th</sup> day from the issue of work order or actual date of commencement whichever is earlier.

## 5. GENERAL GUIDANCE:-

- a. Bidders are advised to submit their offers in sealed covers (through **speed post** /by person only). IIT Indore will not be held responsible for the delay, if any, in the delivery of the bidding document or the non-receipt of the same. Bids sent by Telex/Fax/Telegraph/e-mail will not be accepted.
- b. Instructions/Guidelines for tenderers for submission of the tenders have been annexed for assigning the agencies to participate in Tendering.
- c. Tenderers/Contractors are advised to follow the instructions provided in the '**Instructions to Tenderers**' for the submission of the bids before proceeding with the tender.

## 6. Qualification Criteria:

Agencies fulfilling the following shall be considered as eligible.

### (A) Technical Eligibility:

The Bidder should have experience of having executed similar nature of work of value given below during the past 5 years as on date of NIT–

- i. At least 1 (one) completed works costing not less than **Rs 4,00,00,000/-**  
Or
- ii. At least 2 (Two) completed works costing not less than **Rs 3,00,00,000/- each.**  
Or
- iii. At least 3 (Three) completed works costing not less than **Rs 2,00,00,000/- each.**

**Similar nature of work means “Construction of PRE-ENGINEERED / PREFABRICATED / COMPOSITE BUILDING” with PUF panels.**

### (B) Financial Eligibility:

- i. Bidder shall be financially sound and their average annual turnover during last 3 years ending on 31.03.16 shall be at least **Rs 5.00 Crores**, audited copy of Profit & loss account and balance sheet is duly signed by Chartered Accountant with Membership No. & Seal shall be submitted.
- ii. Current Banker's Solvency Certificate to the tune of at **least Rs 2.0 Crores**, indicating Fund & Non fund based Limits separately, for adequate financial soundness from Nationalized/Scheduled Bank, not older than 12 (twelve) months from the date of NIT.
- iii. The bidding capacity of the contractor should be equal to or more than 5.0Cr. The bidding capacity should be submitted by the contractor/ firms with certification of CA. The bidding capacity shall be worked out by the following formula:-

$$\text{Bidding Capacity} = \{[A \times N \times 2] - B\}$$

Where,

- A = Maximum turnover in construction works executed in any one year during the last five years taking into account the completed as well as works in progress. The value of completed works shall be brought to current costing level by enhancing at a simple rate of 7% per annum
- N = Number of years prescribed for completion of work for which bids has been invited.

- B = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited

iv. Should not have incurred loss during the last 03 (three) financial years.

**(C) Statutory Documents & Affidavits etc.:**

- Legal status of the firm indicating registration details, partnership deed, power of attorney in case of partnership firm, affidavit in case of proprietorship firm, memorandum and article of association in case of company. Joint ventures not allowed.
- Copy of **PAN Card**.
- Certified I.T. return for the last 03 (three) years ending **March 2016**
- Audited Balance Sheet for last 03 (three) years ending **March 2016**
- EPF Registration
- Service Tax Registration No.
- Sales Tax/ VAT Registration Certificate/TIN No.
- List of possession of equipments.
- List of Technical Personnel
- Copies of award letter/ contract/ Work Orders.
- Completion certificate along with performance Certificate and payment certified copy or any other document evidencing value of completed portion of work to be submitted, giving name of work, value of works, completion period etc.

In support of above following document/details shall be submitted along with the tender marked as “**Cover-II**” in hard copy.

- The above documents / details must be submitted in hard copy as per following Cover Details and the scanned copy of same must be submitted.

<b>Cover Details for Submission of tender:-</b>	
<b>Cover - I</b>	<b>Cost of Tender Document, EMD, Letter of Transmittal, Declaration &amp; Bank Details.</b>
<b>Cover – II</b>	<b>Pre-Qualification documents with all supporting documents as mentioned above to fulfill eligibility criteria.</b>
<b>Cover - III</b>	<b>Complete NIT including Technical Specification, Drawings (as required), Corrigendum if any, as a token of acceptance.</b>
<b>Cover - IV</b>	<b>Price Bid (Lump sum quotation along with BOQ for internal services)</b>

- Empanelled agencies are exempted from submitting the pre-qualification documents mentioned in clauses 6 A to 6C. However, the empanelled agencies should submit the documents related to bidding capacity (as per clause 6B iii) and copy of empanelment letter issued by IIT Indore.
- (B) Tender submitted along with all requisite documents will be evaluated by the Tender Committee of IIT Indore at its sole discretion and the Price Bids of qualified agencies will only be opened at specified date and time which will be intimated later.
- (C) The Tenderers are encouraged to visit and examine the site of works and acquaint with site surroundings and obtain all information that may be necessary. The cost of visiting the site shall be at the Bidder’s own expenses.

- (D) NO CONDITIONAL/ INCOMPLETE TENDER will be accepted under any circumstances.
- (E) The Tenderers are requested to deposit Earnest Money (EMD) in any of the following forms:-
- (a) The deposits, receipt etc. in the form of Demand Draft/ Banker's Cheque etc. are to be drawn in favour of **Registrar, IIT Indore** payable at Indore from nationalized bank.
  - (b) No interest shall be allowed on the Earnest Money deposited.
  - (c) No Cheque will be accepted for EMD.
  - (d) The Earnest Money will be refunded to the unsuccessful Tenderers within a reasonable time without any interest.
  - (e) The Earnest Money deposited by the successful Tenderer/ Tenderers will be refunded after submission of PBG.
- (F) During scrutiny, if it comes to the notice to Tender Inviting Authority that the credential or any other Papers Found incorrect / manufactured / fabricated, that tendered will not be allowed to participate in the tender and that Application will be out rightly rejected without any prejudice.
- (G) Tenderer should submit the details of items to be executed along with specifications and bill of quantities in support of lump sum price bid.
- (H) The acceptance of Tender and award of contract (AOC) to one and more than one Contractor, if considered necessary, will rest with the Employer who does not bind himself to accept the lowest Tender and will reserve to himself the authority to accept a Tender in whole or in part or reject any or all the Tenders received without assigning any reasons and no explanation can be demanded for the cause of rejection of his Tender by any Tenderer, neither any claim whatsoever on this score is tenable.
- (I) The Tenders shall be valid for a period of 03 (three) months i.e. 90 days from the date of opening of price bid or any extension thereto.
- (J) Tender documents in which the Tender is submitted by a Tenderer shall become the property of the IIT Indore and the IIT Indore shall have no obligation to return the same to the Tenderer.
- (K) IIT Indore reserves the right to:
- i) To postpone/change/cancel the above mentioned date, modify the terms and conditions include new items and conditions, split and distribute the work amongst more than one agency etc. in the interest of the Project(s)/ Company, without assigning any reason whatsoever.
  - ii) To ask for further Clarifications etc. anytime, as and when required.
  - iii) To cancel the NIT/ tender work against the above Notice, anytime without assigning any reason whatsoever for which no claim on any ground shall be entertained.

- iv) To verify the particulars furnished by the tenders independently, if any information furnished by the tenderer is found incorrect at any stage, the agency shall be liable to be debarred from tendering/cancellation of order including imposition of penalty, any other action as deemed necessary.
- v) To accept or reject any or all the applications received, as its own discretion, without assigning any reasons whatsoever for which no claim on any ground shall be entertained. Tender in which additional conditions are put forth by the agencies, shall be summarily rejected.

**Superintending Engineer & Project in Charge**  
**IIT Indore**

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**INSTRUCTIONS  
TO  
TENDERERS**



## INSTRUCTIONS TO TENDERERS

1. Lump sum Bids are invited by IIT Indore on two stage four cover systems for "CONSTRUCTION OF MULTIPURPOSE HALL (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)" ON DESIGN & BUILD BASIS AT IIT INDORE, SIMROL CAMPUS to be submitted to the Superintending Engineer & Project in Charge, IIT Indore in four folders [Technical (Cover-I, II &III) and Financial (Cover-IV)] before the prescribed date & time in NIT.
2. The employer reserves the right to postpone the date for presentation and opening of Tenders and will give timely notice of any such postponement to the prospective Tenderers.
  - i. Acceptance or rejection of any tender is left entirely to the discretions of the authority empowered to deal with the matter and no query/ explanation can be demanded by any Tenderer for the cause of rejection of his tender.
  - ii. If the Tenderer deliberately gives wrong information in his Tender or creates circumstances for the acceptance of his tender, the Employer reserves the right to reject such Tender at anystage.
  - iii. If a Tenderer seeks in clarifying his quotations or rates, this should only be done in a separate covering letter. No material modifications to the specifications, item descriptions, contract clause, etc. will however be entertained. Other clarifications may be considered. The contents of a covering letter sent along with the tender will be considered as part of the quotation. If any of these conditions admitted for consideration has a financial bearing on the cost quoted, the additional cost arising out of these conditions will be added for comparative evaluation of tenders.
  - iv. By submitting a tender for the work, a Tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the work, that the rates quoted by him in the tender will be adequate to complete such work according to the specifications and conditions attached thereto and he has taken into account all conditions and difficulties that may be encountered during its progress and to have quoted labour and material rates which shall include cost of materials with taxes, Octroi and other duties, lead, lift, loading and unloading, freight for materials, and all other charges including the furnishing of all plant, Equipment, tools, scaffolding and other facilities and services, necessary or proper for the completion and maintenance of the work, except such as may be otherwise expressly provided for in the contract documents for the completion and maintenance of the work to the entire satisfaction of the Engineer.
  - v. The successful Tenderers shall make his own arrangements for all materials, except as specified in the contract, if any.
  - vi. Each tender shall be signed by the Tenderer with his Seal & signature. Tender by partnership or joint family firm may be signed in the firm's name by one of the partners or the karta or manager as the case may be or any other duly authorized representative followed by the name and designation of the persons so signing. An attested copy of the partnership deed must accompany the tender of any partnership firm.

- vii. Tenders by a company shall be signed with the name of the company by a person authorized on his behalf and Power of Attorney or other satisfactory proof showing that the person signing the tender documents on behalf of the company is duly authorized to do so, shall accompany the tender. The Employer will not be bound by any Power of Attorney granted by the Tenderers or by changes in the composition of the firm, made subsequent to the execution of the contract. It may, however, recognize such Power of Attorney and changes after obtaining proper legal advice, the cost of which may be chargeable to the contractor.
- viii. With their quotations, the Tenderers shall submit by signing all schedules, specifications, special conditions, etc. in token of acceptance thereof. The signature on the tender schedule alone shall also be deemed to be taken as acceptance of all these.
- ix. If a Tenderer expires after the submission of his tender or after the acceptance of his tender the Employer may deem such tender as cancelled. If a partner of the firm expires after the submission of their tender, the Employer may deem such tender as cancelled UNLESS THE FIRM RETAINS its character.
- x. If the Tenderer has a relative employed in any capacity in the IIT Indore, he shall inform the authority calling for tenders of the said fact when submitting his tender, failing which his contract may be rescinded. If the said fact subsequently comes to light he shall be liable to make good to the Employer any loss or damage resulting from such cancellation.
- xi. No contract work however petty may be carried out except under and in accordance with a duly executed agreement or on a special written authority from a duly authorized officer of the Employer.
- xii. No agreement is valid unless signed by contractor or his duly authorized agent and by a competent person on behalf of the Employer.
- xiii. The form of Agreement, Form of Tender, Invitation to Tender, Instruction to Tenderer, Special Conditions of Contract, Specifications, Drawing, Time Schedule and the rates and amount accepted against the items of the Tender schedule together with the tender covering letter, and all correspondence entered into between the Employer and the Tenderer prior to the issue of the Letter of Intent and the Letter of Intent awarding the work shall form the contract.
- xiv. If there is any conflict between any of the provisions in the special conditions and those in any of the other documents referred to, the provisions in the special conditions shall prevail.
- xv. In the event of any discrepancy between the rate quoted in the Tender in words and those quoted in figures, the rates quoted in words shall control.
  - Acceptance of the tender will be intimated to the successful Tenderer through a letter of acceptance. The contractor shall then be required to execute an Agreement within the time specified in the letter of acceptance. In the event of failure on the part of the contractor to sign the Agreement within the specified time, the amount of Earnest Money shall be forfeited and the acceptance of his tender shall consider as withdrawn.

- The forfeiture of Earnest Money is to be considered as covering all losses and liquidated damages notwithstanding any other provisions envisaged for losses or penalties implied in the provisions of the contract.
- xvi. On completion of the work, contractor will hand over the work to the Employer/ authorized representative of IIT Indore in approved format and after clearing the site to the entire satisfaction of the Client.
- xvii. After issue of letter of Intent, Contractor shall execute the formal Agreement in approved format on non-judicial stamp paper of not less than Rs. 500/- (Rupees Five Hundred only).The cost of stamp paper shall be borne by the Contractor.
- xviii. The bidder has to seal & sign and submit the required bid documents as indicated. Bidders to note that submitting their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.

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# **General Conditions of Contract (GCC) Certificate**

(To be submitted on Agency's Letter head in hard copy to the SE &PIC, IIT Indore)

**Declaration**

I / We hereby certify to have seen and gone through the General Condition of Contract of CPWD GCC 2014 on the CPWD web site and hereby convey my / our acceptance of the same.

**Signature of the  
Tenderer with Seal**

The names of concerned authorities as per GCC 2014 of CPWD should be read as below:

<b>S.No.</b>	<b>Name of Concerned authority as per GCC of CPWD</b>	<b>To be read as</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	President of India	IIT Indore
2	Engineer-In-Charge	Executive Engineer IIT Indore
3	Director General	Director, IIT Indore
4	Department	Estate Section, IIT Indore
6	Chief Engineer CPWD	Project In charge,
7	Director General (works)CPWD	Director, IIT Indore
8	Additional Director General	Director, IIT Indore
9	The Divisional Engineer	Executive Engineer, IIT Indore

The word "CPWD" will remain intact, wherever the rules, forms, formats, annexures, appendices, clauses, rate analysis formats, specifications etc. published by CPWD are referred

## SCHEDULES (A to F)

### **SCHEDULE 'A'**

Schedule of quantities-To be submitted by bidders in support of their lump sum price bid along with BOQ for internal services.

### **SCHEDULE 'B'**

Schedule of materials to be issued to the contractor

S.No.	Description of item	Quantity	Rates in figures & words at which the material will be charged to the contractor	Place of Issue
1	2	3	4	5
-----NIL-----				

### **SCHEDULE 'C'**

Tools and plants to be hired to the contractor

SI.No.	Description	Hire charges per day	Place of Issue
1	2	3	4
-----NIL-----			

### **SCHEDULE 'D'**

Extra schedule for specific requirements/ documents for the work, if any.

1. Special Conditions - Sheet No. 19 to 25
2. Specifications. - Sheet no. 34 to 48

### **SCHEDULE 'E'**

Reference to General Conditions of Contract :

General Conditions of contract 2014 for CPWD works amended up to date.

- 1.1 Name of Work: "CONSTRUCTION OF MULTIPURPOSE HALL (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)" ON DESIGN & BUILD BASIS AT IIT INDORE, SIMROL CAMPUS
- 1.2 Cost of work: - To be quoted by bidder
- 1.3 Earnest Money: - Rs. 10, 00,000/-
- 1.4 Performance Guarantee 5.00% of tendered value
- 1.5 Security Deposit 2.5% of tendered value

### **SCHEDULE 'F':-**

#### **General Rules & Directions:-**

Officer Inviting Tender

Superintending Engineer& Project In charge, IIT Indore

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3 of GCC.

See below

**Definitions:-**

2(v) Engineer-In-Charge

Executive Engineer,  
Indian Institute of Technology Indore,

2(viii) Accepting Authority

Director, IIT Indore

2(x) Percentage on cost of materials and labour to cover all overheads and profits

15%

2(xi) Standard Schedule of Rates

NA

2(xii) Department

Estate section, IIT Indore

9(ii) Standard CPWD Contract Form

Not Applicable.

**Clause-1:**

(i) Time allowed for submission of performance guarantee after date of issue of letter of acceptance

**5 days**

(ii) Maximum allowable extension with late fee @0.1% per day of the performance guarantee amount beyond the period provided in (i) above

**10 days**

**Clause-2:**

Authority for fixing compensation under clause-2.

Director, IIT Indore

**Clause – 2A :**

Whether clause-2A shall be

Yes, applicable

**Clause-5:**

Number of days from the date of issue of letter of acceptance for reckoning date of start

10 days or the date of actual start  
Whichever is earlier.

Mile Stone

Not Applicable

Time allowed for execution of work

**150 Days**

i. Extension of time for completion of work.

Director, IIT Indore

ii. Re-scheduling of Mile stone

Not Applicable

iii Shifting of date of start in case of delay in handing over of site.

SE &PIC IIT Indore



**Clause-6, 6A:-**

Clause applicable- (6 or 6A) :-

~~6A~~

**Clause-7:-**

Gross work to be done together  
advances for material collected,  
if any, since the last such payment  
for being eligible to interim  
payment

- Not Applicable

Not Applicable

**Clause-10A:-**

List of testing equipment to provided by the  
contractor at site lab

Not Applicable

Not Applicable.

**Clause-10-B (ii).**

Whether clause 10-B (ii) shall be                      NA  
Applicable

No

**Clause-10C:-**

Component of labour expressed as

Percent of value of work

30%

Not Applicable.

**Clause 10 CA:     Not applicable**

NA

**Clause-10-CC:     Not applicable**

Not Applicable

**Clause 11**

Specifications to be followed for execution of work- As per  
tender

**Clause-12:-**

Type of Work :

Original work.

12.2 & 12.3

Deviation limit beyond which  
clause 12.2 & 12.3 shall apply  
for building work.

Not applicable.

12.5

Deviation limit beyond which  
clause 12.2 & 12.3 shall apply  
for foundation works

Not Applicable.

**Clause-16:-**

Competent Authority for  
deciding reduced rates.

Superintending Engineer IITL.

**Clause-18:-**

List of mandatory machinery tools  
& Plants to be deployed by the  
Contractor at site

As per requirement of work/site.

Not Applicable

**Clause 19 L-**

**Clause-25 :**

Constitution of Dispute Redressal  
Committee (DRC)

Chairman - Dean Planning, IIT Indore.  
Member - SE & PIC, IIT Indore.  
Member -Executive Engineer, IIT Indore.

**Clause-36 (i)****Minimum Requirement of engineers and recovery Rate**

Sl No	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical /Technical representative)	Minimum Experience	Number	Rate at which recovery shall be made	
						from the contractor in the event of not fulfilling provision of clause 36(i)	
						Figures	Words
1.	B.E	Civil	Project Manager	10	01	Rs 40,000/- Per month	Rs forty thousand per month
2	Diploma	civil	Sr. Engineer	5	1	Rs 25,000/- Per month	Rs. Twenty Five Thousand per month
3	Diploma	Elect.	Sr. Engineer	5	1	Rs 25,000/- Per month	Rs. Twenty Five Thousand per month

**Assistant Engineers retired from Government Services that are holding Diploma will be treated at par with Graduate Engineers**

**Clause-42:-**

- i) a) Schedule / Statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2016 printed by C.P.W.D
- ii) Variations permissible on theoretical Quantities.
  - a) Cement- for works with estimated cost put to tender not more than Rs. 5 Lacs.3% plus/minus  
  
For works with estimated cost put to tender more than Rs.5 lakh 2% plus/minus
  - b) Steel Reinforcement and structural steel sections for each diameter, section and category.2% plus/minus
  - c) Bitumen for all work 2% plus/minus
  - d) All other materials Nil

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# **Special Conditions of Contract**

## **INDIAN INSTITUTE OF TECHNOLOGY INDORE**

**Name of Work:** -“CONSTRUCTION OF MULTIPURPOSE HALL (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)”

ON

DESIGN & BUILD BASIS AT IIT INDORE, SIMROL CAMPUS.

### **Special Conditions of Contract.**

#### **1.0 General:**

- 1.1** The several documents forming the contract are to be taken mutually explanatory of one another. In case of contradiction between Indian or other applicable Standards, General Conditions of Contract, Special Conditions of Contract Specifications, Drawings and / or Schedule of Rates, the following shall prevail in order of preference:-
- (a) Detailed Letter of Acceptance (LOI) along with Statement of Agreed variations, if any.
  - (b) Schedule of Rates / Lump sum Price as enclosure to Letter of Acceptance.
  - (c) Important Note
  - (d) Special Conditions of Contract
  - (e) Job / Particular Specifications.
  - (f) Drawings
  - (g) Technical Specifications
  - (h) CPWD General Conditions of Contract 2014.
  - (i) Indian Standards.
  - (j) Other applicable Standards.
- 1.2** If there are any varying or conflicting provisions among the documents forming part of the contract, the Employer shall be the sole deciding authority with regard to the intention of the documents and his decision in this respect shall be final and binding.
- 1.3** The contractor shall furnish full information such as his full name and addresses and place of residence in case of an individual, the names of all partners with address and partnership deed in case of partnership firm and the Memorandum of Article and Article of Association in case of Company.
- 1.4** The Employer reserves the right to accept a tender in whole or in part or reject any or all the tenders received without assigning any reasons and no explanation can be demanded of the cause of rejection of his tender by any tenderer.
- 1.5** In case of provisions/specifications not covered in the tender documents, decision of the employer towards its applicability shall be final and binding on the contractor.
- 1.6** The tenderer must have valid T I N issued by CG state Govt. under CG VAT Act, if not registered, the successful tenderer must get registered with appropriate authority within one month from the award and submit the same.
- 1.7** The work is to be executed by the contractor on behalf of IIT INDORE, it is obligatory on the part of the contractor to adhere all the provisions of the contract applicable to IIT INDORE for the work except otherwise specified in the documents.

1.8 It will be contractor's responsibility to bring to the notice of Engineer-in-Charge any contradiction / irreconcilable conflict in the Contract documents before starting the works or making the supply with reference to which the conflict exists.

**2.0 Scope of work:**

2.1 Scope of work under this contract shall cover Planning, Design, Supply, Construction and Erection of Multipurpose hall (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING) at IIT Indore, Simrol Campus.

2.2 The contractor would be a sole provider for design, engineering & Fabrication services for the entire PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING (Steel structural works including civil work, cladding, finishing, sanitary, electrical, HVAC, LAN etc.) & shall be responsible for getting necessary approvals.

2.3 The scope of work broadly described under Specifications enclosed.

**3.0 Time schedule:**

3.1 Time is the essence of this contract. The work is to be completed within **150 days** in all respect.

**4.0 Rate:**

4.1 The quoted amount of lump sum contract shall be inclusive of all labour and materials, equipments, transport, handling, excise duty, entry tax and all taxes & duties etc. except service tax.

4.2 The amount of lump sum contract quoted shall be including all leads, lifts and descents involved in the work.

4.3 No separate payment will be made for dewatering. cost of de-slushing and allied operations at any stage of the work on any account is deemed to be included in the price

4.4 (i) Contractor shall furnish necessary documents required for availing CENVAT/VAT/GST by IIT Indore.

(ii) If the agency is Individual proprietary firm/partnership firm, the Service Tax component paid/payable by IIT Indore under Reverse charge for the work shall be recovered from the contractor.

**5.0 Payment:**

5.1 Payment for the work done shall be made only after the receipt of RA bills/ final bill, field verification & checking by IIT Engineers as per payment schedule.

5.2 WCT, TDS, VAT, SD etc. will be recovered as per rules in vogue.

**6.0 Earnest Money:**

6.1 No interest shall be allowed on the Earnest Money deposited by the contractor. The Earnest Money shall be refunded to the unsuccessful tenderer within a one month.

**7.0 Security Deposit:**

7.1 Security Deposit shall be recovered @2.5% of bill value and shall be refunded after completion of defect liability period of 12 months.

## **8.0 Performance guarantee**

8.1 The contractor shall within 5 days from the date of award submit performance guarantee @ 5% of the contract price in the form of BG to the Engineer In- Charge.

## **9.0 Supply of materials:**

9.1 All materials required shall be arranged by contractor at his own cost.

## **10.0 Supply of Equipments:**

10.1 All equipments, T&P etc. required for the successful completion of work shall be arranged by the contractor at his own cost and should meet requirement of deployment.

## **11.0 Insurance**

The contractor shall obtained Contractors All Risk policy (C A R Policy) from any approved company. The policy so obtained shall cover the entire period of construction (including all extensions) and also shall cover the defect liability period. The policy shall be for the total Contract amount contract. All amounts/charges towards premium etc. on this account shall be borne by the contractor.

## **12.0 Specifications:**

12.1 The work shall be carried out as per Specifications attached with the tender and terms & conditions applicable for the work and as directed by the Engineer in charge.

12.2 All materials for construction and workmanship if not covered in the above specification, shall conform to the latest relevant Indian Standard Specifications and also the national Building code. In case any material or workmanship is not covered by Indian Standard, Employer's General specifications shall apply.

12.3 In case of contradictions in applicability of particular specification related to items of work, decision of IIT INDORE shall be final and binding on contractor.

## **13.0 Setting out of works:**

13.1 The contractor is responsible for the true and proper setting out of the work and for the correctness of positions, levels, dimensions and alignment of all parts of the works and for the supply of necessary instrument, appliance and labor required. If at any time, during the progress of the work, any error shall appear or arise in the levels, dimensions or alignment, of the work, the contractor shall rectify the same at his cost to the satisfaction of the Engineer.

13.2 Site office, development of fabrication yard and store required for the work is to be made by the contractor at his own cost.

#### **14.0 Employment of Engineers:**

14.1 To ensure accuracy in setting out and in quality control, the contractor must engage full time on the job, adequate number of qualified engineers & supervisors possessing the requisite construction experience. The contractor shall submit organization chart for the technical personnel to be deployed for the work.

14.2 The onus of getting requisite technical experts at site will be responsibility of Contractor. Any issue related to visa of their technical experts shall not be taken as force majeure condition or delay on part of Employer for extension of contract.

14.3 In the event of non-deployment recovery shall effected from bill.

#### **15.0 Detailed Design & Drawings:**

15.1 Reference sketches are enclosed based on which contractor has to prepare detailed drawings and quote rate taking into consideration scope of work/facilities required and indicated in the tender.

15.2 Upon approval of preliminary drawings contractor shall design and get the same proof checked.

15.3 The work shall be carried out as per approved drawings. The Engineer, however, reserves the right to alter or modify the drawings supplied. No claim on account of such modifications or alterations made in the drawings shall be entertained.

#### **16.0 TIME SCHEDULE:**

16.1 Time is the essence of the contract.

16.2 Contractor shall prepare and submit a time and progress chart (on critical path method) within 5(five) days from the date of issue of LOI showing broadly the major activities along with the target dates for completion and the resource planning for executing the work. The above work programme indicating the items and other related items for completion of the works shall be prepared which is to be updated regular interval and modified accordingly. In no case, the overall dates for each of the mile stone fixed for the important items should be changed without prior consent/approval of the owner.

#### **17.0 Safety Precautions & Security:**

17.1 The contractor at his cost has to observe all the safety rules, safety measures and security regulations promulgated by the IS code/concerned department from time to time failing, which the same will be got done through other agencies and the cost so incurred will be recovered from the contractor.

17.2 It will be entirely the responsibility of the contractor to ensure that his vehicles are not driven with so high speed and so reckless or rash manner as to cause accident or prove to be a potential threat to the safety of the traffic

- 17.3
- A) Where speed limits have been fixed, they will be strictly adhered to by the contractor drivers who will also adhere to slow and safe driving inside the institute campus. Failure to comply with the above may result in the termination of the contract.
  - B) Similarly, if a driver or any staff of the contractor is caught in a theft case or his unauthorized movement of materials or any activity which is punishable under law or not authorized by IIT Indore, the contractor will bear the full responsibility for the loss and other consequences which may result due to such illegal and unauthorized acts beside the action to terminate the contract
  - C) In case of accident, injury or damage caused by the contractor's vehicles or staff to any person or property, the financial responsibility to compensate will be borne by the contractor and this amount may, at the discretion of the competent authority, be recovered from the bills or security or other deposits of the contractor.

## **18.0 Statutory obligation on the Contractor:**

18.1 Statutory obligations as per minimum wages Act of Government of India shall be to the Contractor's account.

18.2 The responsibility regarding payment of compensation on account of accidents, medical facility and deaths rests with the contractor.

18.3 The contractor shall strictly adhere to the labour Rules and Regulations issued by the state and central Government from time to time and statutory obligation with regard to payment to labours employed for such works and other financial implications there of shall be to the contractor's account and he shall produce muster sheet, acquittance rolls, etc., whenever called for.

18.4 The contractor shall indemnify the Employer from any claim under the worker's Compensation Act or from any other claims for damage for personal injury including death which may arise from operations under this contract whether such operations being by himself or by any or his sub-contractor or any one directly or indirectly employed by either of them.

## **19.0 Liquidated damages for delay:**

19.1 The penalty as per the clause of CPWD GCC 2014 will be applicable.

20.0 Wage shall be paid by the contractors to the workmen directly without the intervention of any jamadars or thekedars and that the contractor shall ensure that no amount by way of commission or otherwise be deducted or recovered by the jamadars or thekedars from the wage of workmen.

21.0 **Contractor** shall maintain all records/registers in proper order as required in the provisions of various labour laws of Central Govt. and / or State Govt. and shall make these available to the Employer or his representatives for inspection as and when required.

## **22.0 Reference to Enactments:**

The reference to various enactments in the General or Special conditions shall include any statutory modifications or re/enactment thereof for the time being in force and any rules and regulations made there under.

The reference to various enactments in the General or Special conditions shall include any statutory modifications or re/enactment thereof for the time being in force and any rules and regulations made there under.

23.0 The decision of the IIT Indore in any matter arising out of the contract shall be final and binding on the contractor

23.1 The contractors shall provide all necessary safety appliances to their workers and supervisors, proper supervision of the work shall be carried out by the Contractors. They should follow all the provisions in the factories Act with particular reference to safety and health hazards. They also should use only tested lifting tackles, slings, wire ropes, etc. While working in operational area or in location where any shutdown is involved written line clearance from the appropriate safety authority shall be taken before starting the work

For any contravention of the above, they will be liable for

23.1.1 Warning letter for the 1<sup>st</sup> minor Violation.

23.1.2 Penalty equivalent to the imposition by client

23.1.3 Black listing for the 3<sup>rd</sup> violation.

23.1.4 The contractors shall display minimum 4 nos. of safety slogan board duly approved by IIT Indore at work sites at contractor's cost and care. Failing in compliance, penalty shall be liable in such case.

23.2 In the event of any dispute and/or difference whatsoever arising under this agreement or in connection therewith, including any question relating to meaning and interpretation of this agreement or any alleged breach thereof, the same shall be settled as far as possible by mutual



discussions and consultation between the parties of this agreement. In the event of such disputes/or difference not being settled in aforesaid manner, the dispute shall be referred to the appropriate Court of Law jurisdiction over the matter and not through "Arbitration".

23.3 Non-stipulated Material:

The recovery rates for all materials / consumables, equipments which are not stipulated in the agreement and are issued with prior approval of competent authority against the specific request of the contractor, shall be fixed by the employer being highest of the following three options and shall be acceptable to the contractor.

- (a) The element of cost of the item in rate(s) quoted by the contractor for finished item (whenever applicable)
- (b) The market rate prevailing plus 15%overhead.
- (c) The stock issue rate of the organization plus 15%overhead.

24.0 Water: - Contractor has to make his own arrangements for water. He may bore Tube well and pump water at his own cost. Contractor has to handover the bore well to the Institute free of cost after completion of work. The contractor has to measure the quality of water drawn from the bore well. If available, water will be supplied to the contractor from Institute for which the contractor has to take connection at his own cost from closest tap available to the site and the charges will be recovered from the contractor at commercial rate for which the contractor has to provide water meter at his own cost.

25.0 Electricity: - The contractor will have to make his own arrangement for electricity, either by taking Temporary Electric connection from the local authority or by using DG sets. If available, electricity will be supplied to the contractor from Institute for which the contractor has to take connection at his own cost from closest tapping point available to the site and the charges will be recovered from the contractor at commercial rate for which the contractor has to provide energy meter (sub meter) at his own cost.

26.0 Labour accommodation will not be permitted in the institute campus.

27.0 The bidder to whom the work is awarded, must submit the structural stability certificate and occupancy certificate after successful completion of the building construction work.

28.0 Defect liability period for the work will be 12(twelve) months from the date of completion of building in all respect.

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# **Form of Agreement**

**FORM OF AGREEMENT**

The Agreement made the .....day of ..... BETWEEN IIT Indore (herein after called the Employer of the one part ) and.....of (herein after called the "CONTRACTOR" of the otherpart).

WHEREAS the Employer is desirous that certain works should be constructed viz. .... and has accepted a Tender by the Contractor for the construction, completion and maintenance of such works.

NOW THIS AGREEMENT WITNESSTH as follows:-

1. In this Agreement words and expression shall have the same meaning as are respectively assigned to them in the conditions of contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement viz.-
  - a) The said Tender.
  - b) Invitation to Tender
  - c) Instructions to Tenderers.
  - d) Special Conditions of Contract.
  - e) General Conditions of Contract.
  - f) Tender document containing scope of work, Technical Specifications, Bill of Quantities & Tender drawings.
  - g) Accepted offer.
  - h) Time schedule.
  - i) Drawings.
  - j) Correspondence between the Employer and the Contractor prior to issue of the letter of intent viz.....
  - k) Letter of Award/Letter of Intent
3. In consideration of the payments to be made by the Employer to the contractor as here-in-after mentioned the contractor hereby covenants with the Employer to construct, Complete and maintain the works in conformity in all respects with the provision of the contract
4. The Employer hereby covenants to pay the contractor in consideration of the construction, completion and maintenance of the works the contract price at the time and in the manner prescribed by the contract

IN WITNESS WHEREOF THE parties hereto have hereunto set their respective hands and seals the day and year first above written.

Signed, sealed and delivered by the said .....  
..... in the presence of.

Dated signature of Contractor

Dated signature of the

In the capacity.....

Employer.....

on behalf of.....

Designation.....

**WITNESS :**

# **Letter of Transmittal**

## LETTER OF TRANSMITTAL

*(In the Letter Head of the Bidder)*

To  
Superintending Engineer & PIC,  
IIT Indore, First floor, PHY2, POD3,  
Simrol campus, Khandwa Road, Indore (MP).

**Sub:** Submission of Tender for the work of "Construction of Multipurpose Hall (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)" on Design & Build Basis at IIT Indore, Simrol Campus

Ref:-NIT. No.:

Dear Sir,

Having visited the Site, ascertained the Site conditions and examined the General Conditions of Contract as well as Special Conditions of Contract, Notice Inviting Bids, Instructions to Bidders, GCC etc. and addenda for the above project, we the undersigned, are pleased to submit our Bid along with relevant documents as below :-

1. We acknowledge our unconditional acceptance for all the terms & conditions of the Tender.
2. While preparing this Bid, we have gathered our own information and conducted our own inquiry / survey to our satisfaction and we did not rely solely on the information provided in this BID. We shall not hold **IIT Indore** responsible on any account in this regard.
3. We undertake, if our Bid is accepted, to commence the works within the stipulated time and to complete the whole of the works comprised in the Contract document within the stipulated time based on the reckoned date of start as scheduled.
4. If our Bid is accepted, we will furnish a bank guarantee as Performance security for the due performance of the Contract. The amount and form of such guarantee or bond will be in accordance with as given in the General Conditions of the Contract.
5. We are aware that in the event of delay in execution of the Project, beyond the agreed schedule due to reasons attributable to us, liquidated damages shall be recovered from us as per Conditions of Contract.
6. Our Bid is valid for a period of **90 days** from the last date of submission of the Bid as per the BID or any extension thereto. We agree to the General Conditions of Contract and Special Conditions of Contract and the terms and conditions mentioned in the B I D .
7. We declare that for submission of this Bid confirms that no agent, middleman or any intermediary has been, or will be engaged to provide any services, or any other item of work related to the award of this Contract. We further confirm and declare that no agency commission or any payment, which may be construed as an agency, commission has been, or will be, paid and that the Bid price does not include any such amount. We acknowledge the right of **IIT Indore**, if it finds anything to the contrary, to declare our Bid to be non-compliant and if the Contract has been awarded to declare the Contract null and void.

Contd.P/2

8. We understand that you are not bound to accept the lowest or any Bid you may receive.
9. If our Bid is accepted we understand that we are to be held solely responsible for the due performance of the Contract.
10. We enclose:
  - a. All documents as required in the Bid.
  - b. D.D/Banker's Cheque etc. for Rs \_\_\_\_\_  
(Rupees \_\_\_\_\_ only) issued by \_\_\_\_\_  
\_\_\_\_\_(Name of the bank) Vide No. \_\_\_\_\_  
\_\_\_\_\_ Dated. \_\_\_\_\_ Towards EMD.

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 2017.

Signature \_\_\_\_\_

Name \_\_\_\_\_ in the capacity of \_\_\_\_\_  
\_\_\_\_\_ duly authorized to sign Bids for and on behalf of \_\_\_\_\_

Address \_\_\_\_\_

## Proforma for Performance Bank Guarantee

**Bank Guarantee No.:-**

**Date:-**

**Date of Expiry:**

**Limit of Liability Rs.:-**

1. In consideration of Indian Institute of Technology Indore (hereinafter referred to as 'Client' which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns ) having awarded to M/s \_\_\_\_\_ with its registered /Head office at \_\_\_\_\_ (here in after referred to the 'Contractor' which expression shall unless repugnant to the context or meaning thereof, include its successors , administrators , executors and assigns ) a contract by issue of IIT Indore Letter of Intent no . \_\_\_\_\_ and the same having been unequivocally accepted by the Contractor resulting in a Contract bearing No. \_\_\_\_\_ value at Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) for" \_\_\_\_\_ and the contractor having agreed to provide a Contract Performance Guarantee for the faithful Performance of the entire Contract equivalent to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) 5% (five percent) of the said value of the contract to IIT INDORE, we \_\_\_\_\_ having its Head office at \_\_\_\_\_ (hereinafter referred to as the 'Bank' which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay IIT Indore, on demand any and all money payable by the Contractor to the extent of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) as aforesaid at any time up to \_\_\_\_\_ without any demur, reservation, contest, recourse for protest and/or without any reference to the Contractor. Any such demand made by IIT INDORE on the bank shall be conclusive and binding notwithstanding any difference between IIT INDORE and Contractor or any dispute pending before any Court, Tribunal or any other authority.
2. We, the \_\_\_\_\_ undertake not to revoke this guarantee during its currency without previous consent of IIT INDORE and further agree that the guarantee herein contained shall continue to be enforceable till IIT INDORE discharge this guarantee or \_\_\_\_\_ whichever is earlier.
3. IIT INDORE shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee from time to time to extend the time for performance of the Contract by the Contractor. IIT Indore shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between IIT Indore and the Contractor or any other course or remedy or security available to IIT Indore. The Bank shall not be released of its obligation under this guarantee by any exercise by IIT Indore of its liberty with reference to the matters aforesaid or any of them or by reason of any other acts of omission or commission on the part of IIT Indore or any other indulgence shown by IIT Indore or by other matters or things whatsoever which under law would, but for this provision have the effect of relieving the Bank.
4. The Bank also agrees that IIT Indore and its option shall be entitled to enforce this guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that IIT INDORE may have in relation to Contractor's liabilities.



5. This guarantee shall not be affected by any changes in the constitution of the Contractor nor shall it be affected by any charges in the constitution of IIT INDORE or by any amalgamation or absorption thereof or therewith but will ensure for and be available to and enforceable by observing or amalgamated company or concern.
6. Notwithstanding anything contained herein above, our liability under this guarantee is restricted to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) subject to the clause as stated immediately hereafter. This guarantee shall remain in force till \_\_\_\_\_.
7. This guarantee shall continue and hold good until it is released by IIT INDORE on application of the Contractor after the expiry of the relative guarantee period of the said Contract and after the Contractor has discharged all their obligations under the said Contract and produced a certificate from IIT INDORE's representative certifying the due completion of the work under the said contract and submitted a "No demand certificate" provided always that unless extended this guarantee shall remain in force till \_\_\_\_\_. Should it be necessary to extend this guarantee beyond the said date on account of extension being granted by IIT INDORE to the Contractor in respect of completion of works under the said contractor otherwise, we undertake to extend forthwith the period of the guarantee on the IIT INDORE's request till such time as may be required by IIT INDORE.
8. We, \_\_\_\_\_ shall be discharged of our liability under this guarantee unless a claim is made by IIT INDORE within 6 (six) months from the date of expiry of this Bank Guarantee up to \_\_\_\_\_.

Beneficiary : IIT Indore

Confirmation of BG through Structured Financial Messaging System (SFMS) to our following Bank: -

Bank Branch Name and Address: State Bank of India,  
Khandwa road Indore,

Account holder name: -Registrar IIT Indore,

A/c no: - 31176806225.

IFSC no: - SBIN0011779.

# **Specifications & Scope of Work**

## **Specifications**

**Name of Work:** "Construction of Multipurpose Hall (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)" on Design & Build Basis at IIT Indore, Simrol Campus"

IIT Indore proposes to construct an iconic Multipurpose Hall of size approx. 60.0m x 27.0m x 11.0m (height) with mezzanine floor of approx. 27.0m x 22.5m. having a grand aesthetic appearance.

**The construction work is to be carried out in two phases as below:-**

- i) Phase I- part area admeasuring 27.0mx 22.5m with its mezzanine floor is to be completed in all respect and handed over within 90 days from date of start.
- ii) Phase II- the remaining portion of the building is to be taken up simultaneously and is to be completed in all respect and handed over within 150 days from date of start.

**Brief description of work is as below:-**

1. The proposed building will be PRE-ENGINEERED/PREFABRICATED/COMPOSITE type Building as per relevant IS standard.
2. The hall of size approx. 37.5m x 27.0m x 11m (height) will be used for sports activities, convocations, seminars, gatherings etc.
3. The mezzanine area ground floor (GF) will comprise of dining hall (approx. size 21.0m x 22.5 m), stair case, kitchen/store, wash area, electric room, drinking water area, toilets etc.
4. The mezzanine area first floor (FF) will comprise of dining hall, AHU room, space for water tanks etc.
5. All the external walls on ground floor shall be 3m high brick walls with finishing.
6. For all 4-side External Wall Cladding & Facia- PUF PANEL of suitable density is proposed confirming to relevant IS standard.
7. For Roofing above purlins/trusses-Roof PUF PANEL of suitable density is proposed confirming to relevant IS standard.
8. Suitable false ceiling is proposed to cover the roof structure confirming to relevant IS standard.
9. For Mezzanine floor level- standard sheet over structural framework with LIVE LOAD, Dead load as per relevant IS standard, minimum clear height as 5mtr from FFL to top of slab is proposed.
10. Suitable Doors, Windows and ventilators with frame and sun shade are to be provided as per functionality.
11. The CIVIL WORK will involve all associated works like foundations, RCC, PCC, brickwork up to plinth level, plinth filling with moorum, RCC plinth slab, IPS Flooring for main hall, 1<sup>st</sup> quality anti skid full body vitrified tiles in mezzanine area, plinth protection etc.
12. 1<sup>st</sup> quality ceramic floor tiles (anti skid) and wall tiles, 1<sup>st</sup> quality sanitary installations and CP fittings are proposed in toilets.
13. Steel stair case in mezzanine area having width 2.0m (each flight) with S.S. railing is proposed.
14. The samples of materials, tiles, fittings etc. are to be got approved by Engineer in Charge prior to commencement of activity.

### Scope of Work:

The scope of work covers planning, design and construction of PRE-ENGINEERED / PREFABRICATED / COMPOSITE BUILDING for **multipurpose hall** as per basic layout drawing. It may be noted that the vendor is advised to visit the site prior to bidding to get familiarity with the site condition, accessibility, hindrances etc. and no extra claim on account of site condition will be entertained. The entire design responsibility lies with the contractor.

The contractor would be a sole provider for design, engineering & Fabrication services for the entire PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING (Steel structural works including civil work, cladding, finishing, sanitary, electrical, LAN) & shall be responsible for getting necessary approvals.

The Scope of work for the Structural and Architectural Design will be to provide the design criteria documents for these disciplines required to build this project as per the Indian codes / conditions. The detailed scope of services would be as follows:

- 1 Complete Structural analysis, design and preparation of all structural drawing and details for execution, as per requirement from foundation to roof level.
  - 2 Preparation of all necessary details, drawings, designs (in STAAD pro software for analysis) and manual calculations for designs etc. for submission to different authorities and get the necessary approval of PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING and facilities.
  - 3 Preparation of necessary specifications, documentations, drawings for the entire Steel works and including quantifications.
  - 4 Preparation and submission of design calculation for approval which includes load calculation, detailed analysis of structure and design of structure as per codal requirement including deflection limitations. Contractor shall submit three set of design calculation along with drawing for comments/approval and shall incorporate all comments and shall submit final documents after incorporation of comments.
  - 5 Documents to Furnish in English language, two sets of preliminary sketches, two sets for final approval (hard copies as well as CDs) calculation, analysis, reports, specification, bill of quantities for each work/system after final approval.
  - 6 Preparation of 'Design Basis Report' for the structural as well as MEP services in the building/ structure and finalizing the designs in consultation with IIT Indore
  - 7 Proof checking of designs to be got done by agency at their own cost & expenses from a reputed Educational Institutions like IIT's/NIT's/Research Institutions/ Government Department with prior approval of the IIT Indore.
  - 8 The Structure should be water proof, fire proof and sustainable to rain and wind pressure.
  - 9 The work should be executed by Rapid construction technologies suitable to Geo climatic and hazard conditions of the region, having design compatibility & flexibility and structure stability shall conform to prevailing IS codes.
  - 10 The proposal must have been evaluated for structural stability, fire safety, durability, resistance against water, moisture penetration, thermal behavior, acoustic behavior etc.
- The contractor is also required to submit the following on completion of the Project:
    - i) Three sets of as built drawings as well as CDs of structural & other drawings
    - ii) Three sets of hard copies as well as CDs of design calculation of all structural drawings.

Approved makes of material:

SL. NO.	NAME OF ITEMS	LIST OF APPROVED MANUFACTURERS / BRAND /APPLICATORS
1.	Cement	As per IS 12269 or IS1489 (Part I and Part II). AMBUJA, ULTRA TECH, MANIKGARH, ACC
2.	Reinforcement Bars	Fe500D as per IS 1786. TATA, SAIL, RINL, VIZAG
3.	Structural Steel	TATA, SAIL, JINDAL, RINL, VIZAG
4.	Vitrified/ Ceramic Floor/ Wall Tiles	Premium quality NITCO, JOHNSON,, KAJARIA, Race TILES,
5.	Float Glass	Modi/ Saint Gobain/ Indo- Asahi
6.	Plastic emulsion Paint, Synthetic Paints etc	Asian Paint, Berger, ICI,NEROLAC,, DULUEX
7.	CP fitting	JAGUAR, AQUA PLUS, JONHSON
8.	Sanitary installation	HIND WARE, PARRY WARE, CERA
9.	External paint	Asian Paint, Berger, ICI,NEROLAC
10.	Doors/windows fittings	DORMA, GODRAJ, HARDWIN

DESIGN PARAMETERS:-

- |                |   |   |
|----------------|---|---|
| a) Seismic     | - | As per IS - 1893 with latest amendment(Zone III)  |
| b) Wind Speed  | - | As per IS-875,part3   |
| c) Temperature | - | As per IS - 875, part 5   |
| d) Roof Slope  | - | As per design   |
| e) Soil data   | - | for preliminary designs bearing capacity of soil may be assumed approx. 30T/Sqm at depth of 2.0m below Ground level. (contractors are advised to verify the SBC before designing the foundation.) |

### **ELECTRICAL, HVAC & ELV**

1. Scope of work cover equipment & system design, supply, assembly, testing, transportation, handling, erection, testing and commissioning of electrical, HVAC and ELV material.
2. Preparation and Submission of GFC drawings for approval. Eight sets of approved GFC drawings to be submitted.
3. The contractor shall supply to institute, free of cost, samples of materials to be used on the work and shall get these approved in advance.
4. Preparation and Submission of As-built drawings after completion of works at site. Three sets of As-built drawings after verification (also Autocad soft copy of the same)
5. Electrical work will include (but not limited to) complete illumination system, Conduit work including junction boxes, outlet boxes and wiring for lighting and power circuit. Switches, plug sockets, cover plates and other wiring accessories, Complete LT panels eg MDBs, SDBs, other DBs required for the building, Fans, Power cable, earthing, LA, Fire alarm, etc.
6. The design, manufacture, erection and testing of the equipment and materials to be installed shall comply with latest revisions of relevant Indian Standards. In addition to the Indian Electricity Rules,

Statutory requirements of Central Govt. and State Government of M.P., shall also be complied with. In the absence of the IS, IEC Publication shall be followed.

7. The successful Contractor shall take the full responsibility of guaranteed operation and performance of each supplied & erected equipment/ items and the Electrical and HVAC system for at-least 2 years from the date of handing over.

## **ELECTRICAL**

**Wiring:** The system of wiring shall consist of PVC insulated copper stranded conductor flexible FRLS wires in metallic conduits in exposed and FRLS PVC conduit shall be used in concealed above false ceiling. Wires originating from two different phases shall not run in the same conduit. All wires shall have ferrules for identification. Lighting and power circuits shall be separate. Each Power/ Light Circuit's Neutral shall be individual per Circuit and shall not be looped from any other Circuit. Every main and sub main wires shall be drawn into an independent adequate size of conduit. Minimum wiring size of FRLS copper conductor shall be 1.5 sq mm for light and 4 sq mm for power.

### **Switches & Sockets:**

Modular type plates and switches shall be used. Switch controlling the light point shall be connected to the phase wire of the circuit and load shall be restricted to maximum 800 watts per switch & maximum 1500 watts per circuit. Perfect alignment shall be maintained while fixing of the back boxes.

All 6Amp Socket outlets shall be of international type (multi standard form). After every 10 feet (approx.) of distance the 16 Amp Switch Socket or 6 Amp (alternatively) shall be provide inside the building on

walls with necessary size wire for connection from DBs. Proper finishing will be required for installation of modular plates in building.

### **Panel & DB:**

Main Distribution Panels and other Distribution board shall be suitable for operation on 3 Phase/single phase, 415/240 volts, 50 cycles, 4 wire system with neutral grounded at transformer.

Main panel shall be CPRI / ERDA / ANY OTHER International ACREEDATED labs tested design. Certificate shall be made available. Distribution panels shall comply with the latest International Standards and Electricity Rules and Regulations. Switchboard shall be able to with stand Relative humidity 95% at 55°C. Main panel shall have Indicating Lamps and meters, such that all Multi-Function Meters, voltmeters and ammeters shall be flush mounted. Additional one incomer in main panel shall be provided for Solar Energy input. DBs for light and power control shall be separate. At least 20% spare feeders, terminal block, etc. shall be provided in all Panels and DBs.

Additionally separate double door DBs (4 way vertical TPN) with 63 Amp TPN incomer and outgoings – 32 Amp TP MCB (2 nos.) and remaining SP MCBs of 32 Amp / 20 Amp rating – shall be provided, whose quantities are minimum 4 nos. in double heighted area, 3 nos. inside mezzanine floor and 2 nos. above mezzanine floor.

**Earthing** – Chemical maintenance free earthing of necessary numbers shall be provided by contractor. Test report (earthing measurement) shall be provided as per Standard.

**Light Fixture** – All light fixture shall be LED and Lux level of 500 shall be maintained. Light fixture shall selected in cost effective manner considering the maintenance and operational cost. Supply, installation, testing and commissioning of light fixture shall be in Contractor scope. Additionally the control of 50% of light fixtures shall be designed such that UPS can be connected in case of any institute functions. Some lights points shall be available on double heighted area (Ceiling) so that center path way can be formed by installing focused lights hence such provision shall be available by providing such light points. All required light points, fan points, exhaust fan, call bell points shall be under the scope of contractor. Lights in bathroom shall have occupancy sensors. If LED is not available in market for double heighted area than alternative solution shall be provided.

**Area Lighting:** The scope of works shall include the supply, installation and testing of area lights which will include minimum 10 nos. LED Bollard fixtures for approach road and 10 nos. of MHL (250 watt) fittings on the building.

**Fan** –Wall mounted sufficient size, cost effective (considering the maintenance and operational cost) in double heighted area and also on above mezzanine floor. 5 star rated ceiling fan with desired heighted rod shall be supplied and installed in below mezzanine floor.

**Fire alarm System** – Design, supply, installation, testing and commissioning of complete system pertaining to Fire alarm shall be in scope of Contractor and shall be done as per international standards.

**ESE type Lightning protection** – Design, supply, installation, testing and commissioning of complete system pertaining to ESE type Lightning protection shall be in scope of Contractor and shall be done as per standards.

**Power Cables:** Necessary cable for providing the supply to DBs shall be in scope of Contractor along with cable tray (covered). Selection of power cables shall be sized to restrict the voltage drop to 3%. Also the specifications shall be as per standards with keeping aesthetic view of cable tray. The power cable required for connection to main panel from ESS will be provided from institute however the laying and termination of the cable will be in Contractor scope. The supply and installation of Gland and Lugs needed for termination will be in scope of Contractor. Cable size shall be decided by keeping maximum 60% load.

### **HVAC**

These Specifications cover the equipments and materials for the system, their testing, their delivery at site, all preparatory works, assembling, installation and adjustments, commissioning, final testing, putting in to operation, equipment capacity computation and handing over of the complete system.

### **STANDARDS & CODES**

The applicable Standards/Codes are:

- American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE).
- National Building Codes - Building Services – 2005
- ECBC 2007

- GRIHA Norms
- IS codes for Materials & Safety

#### **AIR WASHERS:**

The packaged air washer shall be of GI sheet metal sectionalized construction and shall include fan section, cooling pad section, motor drive etc.

##### **i) Fan Section:**

The impellers of the fan or fan shall be of GI sheets, double inlet backward curved centrifugal design, both statically and dynamically balanced. The fan housing shall be of sturdy construction made from double skinned GSS casing having 0.6mm precoated GI sheet outside and plain 0.6mm thick GI sheet inside with 25 mm thick puff insulation with smooth air inlets. The fan shall be mounted on properly aligned shaft and mounted on self-aligning bearing blocks. The casing of the cab section shall be made of 16 G (1.6mm) GI sheets suitably reinforced to provide rigidity. The frame work shall either be folded G.I. sheets or of hot dipped galvanized iron. The fan section shall be complete with V belt drive, belt guard and motor mounting base.

##### **ii) Cooling Pad:**

The cooling pads shall be of honey comb design to provide extended and sufficient wetted surface to give a water absorbing efficiency of at least 80% at an air velocity of 3.0 m/sec. The cooling pads shall be made of either acetate paper or high impact PVC. The cross section and depth shall be sufficient for specified efficiency. The cooling pad section shall be of 16 G (1.6mm) G.I. sheet similar to fan section. It shall be complete with galvanized supports for mounting the pads and a water distribution through the uniform supply of water over the entire surface.

##### **iii) Water Sump:**

The water sump below the pad section shall be of minimum 1mm SS 304. The tank shall be complete with makeup, overflow and drain connections. A float valve shall be provided for makeup water line. The pump set shall be of construction, with end suction and top discharge with flanged connections, bronze impeller and casing all mounted directly on a squirrel cage, drip proof induction motor of suitable capacity.

#### **MOTORS:**

The motor for each blower shall be totally enclosed, fan cooled, squirrel cage induction type and conform to specifications, class F insulation with IP 55 protection.

#### **MISCELLANEOUS:**

Necessary accessories shall be provided wherever necessarily required for proper operation and shall also include:

- I. Necessary GI piping for water circulation
- II. Vibration isolations pads for the blowers and pumps
- III. Canvass connections at the outlet of each fan



- IV. Nuts, bolts, shims etc. as required for the grouting of the equipment
- V. Float valves in the air washer tank, along with quick fill connection
- VI. Evaporative cooling units (air washers) should be located preferably on summer-windward side. They should be painted white or with reflective coating or thermally insulated, so as to minimize solar heat absorption.

**LIMITATIONS:**

The air velocity limits are as follows:

- i) Average velocity across air washer filters shall not exceed 2.5 m/sec (500 FPM)
- ii) Velocity at blower outlet shall not exceed 10 m/sec (2000 FPM)

**DUCTING SCOPE**

This chapter covers the general requirements for sheet metal ductwork for air distribution with associated items such as air outlets and inlets, fresh air intake and fire dampers.

**RECTANGULAR DUCTS**

All ducts shall be fabricated either from Galvanized Sheet Steel (GSS) conforming to IS: 277 or aluminum sheets conforming to IS: 737. The steel sheets shall be hot dip galvanized with coating of minimum 150 grams per square meter (GSM) of Zinc.

The thickness of sheets for fabrication of rectangular ductwork shall be as under. The thickness required corresponding to the longest side of the rectangular section shall be applicable for all the four sides of the ductwork.

Longest side (mm)	Minimum sheet thickness	For GSS	For Aluminum
750 mm and below		0.63	0.80
751 mm to 1500 mm		0.80	1.00
1501 mm to 2250 mm		1.00	1.50
2251 mm &above		1.25	1.80

- All sheet metal connections, partitions and plenums required for flow of air through the filters, fans etc. shall be at least 1.25 mm thick galvanized steel sheets, in case of G.I. sheet ducting or 1.8 mm thick aluminum sheet, in case of aluminum sheet ducting and shall be stiffened with 25mm x25 mm x 3 mm angle iron braces.
- Circular ducts, where provided shall be of thickness as specified in IS: 655 as amended upto date.
- Aluminium ducting shall normally be used for clean room applications, hospitals works and wherever high cleanliness standards are functional requirements.

**TESTING**

After duct installation, total duct work (Mechanical Ventilation Ducts) should be tested for leakage. The procedure for leak testing should be followed as per SMACNA – “HVAC Air Duct Leakage Test Manual” (First Edition – 1985)

**DUCTWORK LEAKAGE TESTS:**

- This section of the specification describes the ductwork leakage testing procedure.

- All ductwork shall be pressure tested for leakage, smoke test is not acceptable.
- The sub-contractor shall provide the necessary test equipment and skilled labour to carry out the tests satisfactorily.
- Testes shall be witnessed and certified by the Client / PMC's representative. Prior to witness of final tests, the sub-contractor shall carry out preliminary tests to ensure the test results are within specified limits.
- All duct work shall be tested for leakage without duct insulation or duct enclosure at the joints.
- Accuracy of the test apparatus shall be within:
  - $\pm 5\%$  of the indicated flow rate or 0.5 l/s, whichever is greater, and 5% of the indicated static pressure in duct under test.
- The test apparatus shall have a calibration certificate, chart of graph dated not earlier than one year before the test for which it is used.

### ASSOCIATED ITEMS

Supply/return air outlets, FA grilles and accessories shall be constructed from extruded aluminum sections. Flanges for matching duct sections, stiffening angles (braces) and supporting angles shall be of rolled steel sections, and shall be of the following sizes.

Duct Width	angle size	Application
Flanges	Upto 1000 mm	35 mm x35 mm x 3 mm
	1001mm to 2250 mm	40 mm x40 mm x 3 mm
	More than 2250 mm	50 mm x50 mm x 3 mm
Bracings	Upto 1000 mm	25 mm x25 mm x 3 mm
	More than 1000 mm	40 mm x40 mm x 3 mm

### CONSTRUCTION

#### DUCTS

- Ducts shall be fabricated at site or factory fabricated and shall be generally as per IS: 655 "Specifications for metal air ducts", unless otherwise deviated in these General Specifications.
- The interior surfaces of the ducting shall be smooth.
- All the ducts upto 600mm longest side shall be cross broken between flanges by a single continuous breaking. Ducts of size 600mm and above shall be cross broken by single continuous breaking between flanges and bracings. Alternatively, beading at 300mm centers for ducts upto 600mm longest side, and 100mm centers for ducts above 600mm size shall be provided for stiffening.
- As far as possible, long radius elbows and gradual changes in shape shall be used to maintain uniform velocity accompanied by decreased turbulence, lower resistance and minimum noise. The ratio of the size of the duct to the radius of the elbow shall be normally not less than 1:1.5.
- Flanged joints shall be used at intervals not exceeding 2500mm. Flanges shall be welded at corners first and then riveted to the duct.
- Stiffening angles shall be fixed to the sides of the ducts by riveting at 1.2.5 meters from joints for ducts of size 600mm to 1500mm, and 0.6mm from joints for ducts of size larger than 1500mm. Bracings for ducts larger than 1500mm can alternatively be by/diagonal angles.
- Plenums for filters shall be complete with suitable access door of size 450mm x450mm.

## **FIRE DAMPERS**

Fire dampers shall be provided in all the supply air ducts and return air ducts (where provided), return air passage in the air-handling unit room and at all floor crossings. Access door will be provided in the duct before each set of fire dampers.

Fire dampers shall be multi blade louvers type. The blade should remain in the air stream in Open position & shall allow maximum free area to reduce pressure drop & noise in the air passage. The blades and frame shall be constructed with minimum 1.6mm thick galvanized sheet & shall be factory fitted in a sleeve made out of 1.6mm galvanized sheet of minimum 400mm long. It shall be complete with locking device, motorized actuator & control panel.

Fire dampers shall be motorized smoke & fire dampers type. It shall be supplied with spring loaded UL stamped fusible link to close fire damper in the event of rise in duct temperature. Fire damper shall also close on receipt of fire alarm signal to cut off air supply instantaneously. An electric limit switch shall also

be operated by the closing of fire damper, which in turn shall switch off power supply to AHU blower motor as well as strip heaters.

Fire dampers shall be CBRI tested & certified for 90 minutes rating against collapse & flame penetration as per UL 555-1995 (Underwriters Laboratories)

Fire dampers shall be compatible with the fire detection system of building & shall be capable of operating automatically through an electric motor on receiving signal from fire alarm panel.

Necessary wiring from fire alarm panel up to AHU electric panel shall be provided by the department & further from AHU electric panel to fire damper shall be provided by air conditioning contractor.

## **INSTALLATION OF METALLIC DUCT**

### DUCTING

- The fabrication and installation shall be in a workman like manner. Duct work shall be rigid and straight without kinks.
- All exposed ducts within the conditioned space shall have slip joints. Flanged joints shall not be used.
- All joints shall be airtight.
- Ducts shall be supported independently from the building structure and adequately, to keep the ducts true to shape. The support spacing shall be not more than 2m. Where ducts cannot be suspended from ceiling, wall brackets or other suitable arrangements, as approved by the Engineer-in-charge shall be adopted. Neoprene or other vibration isolation packing of minimum 6mm thickness shall be provided between the ducts and the angle iron supports/brackets. Vertical duct work shall be suitably supported at each floor by steel structural members.
- Where metal ducts or sleeves terminate in woodwork, tight joints shall be made by means of closely fitting heavy flanged collars. Where ducts pass through brick or masonry openings, wooden frame work shall be provided within the openings and the crossing ducts shall be provided with heavy flanged collars on either side of the wooden frame work, so that duct crossing is made leak-proof.
- Duct connections to the air-handling unit shall be made by inserting a double canvas sleeve 100 mm long. The sleeve shall be securely bonded and bolted to the duct and unit casing.
- Dampers shall be provided in branch duct connections for proper volume control and balancing the air quantities in the system, whether indicated in the drawings or not. Suitable links, levers and quadrants shall be provided for proper operation, control and setting of the dampers. Every damper shall have an indicating device clearly showing the position of the dampers at all times.
- Where electrical heaters are mounted in the duct, these shall be of low temperature totally enclosed type fitted with radiation fins. A removable panel for access to the heaters shall be provided in the duct. Any hole in the duct for electrical wiring must be provided with suitable bushes to avoid leakage. 6 mm thick asbestos board lining shall be provided all around the inside of the duct for a

distance of 30cm on either side of the electrical heaters. A manually reset thermostatic safety switch shall be provided near the duct section having heaters. In addition, the heaters must be interlocked with the connected fan motor of the AHU.

**BALANCING**

The entire air distribution system shall be balanced at the time of handing over with the help of an anemometer. The measured air quantities at fan discharge and at the all outlets shall be within ±5 percent of those specified/ quoted. Branch duct adjustments shall be permanently marked after the air balancing is completed so that these can be restored to their correct position if disturbed at any time.

**APPLICATION OF INSULATION (THERMAL) ON DUCT**

Closed Cell Elastomeric Nitrile Rubber for ducting Insulation material shall be Closed Cell Elastomeric Nitrile Rubber. Thermal conductivity of elastomeric Nitrile rubber shall not exceed 0.035 W/moC or 0.0301 Kcal/(hr-m 2 -oC/m) or 0.2037 BTU /(hr-ft 2- oF/inch) at an average temperature of 0oC. Density of material shall not be less than 0.06gm/cm 3. The insulation should have fire performance such that it passes CLASS O as per BS476 Part 7 for surface spread of flame. Water vapour permeability should not exceed 0.06 Per inch (3 x 10 -10 Kgs/m.hr.Pa).

Design, Supply, Installation, testing and commissioning of complete evaporative air cooling system for building will be under the contractor scope. Work shall be done as per international safety codes and standards. Work shall include necessary and required water (supply and drain) system and power requirement (cable, panel, controller, etc.) for completing the installation. Additionally solution shall be available and provided for approach path to units and ducts for maintenance purpose.

The Contractor should give detailed heat load calculations used for designing the Air Cooling system for approval.

The Contractor shall fix at appropriate plate, neatly typed and framed instructions in details, for the starting and running of the HVAC system. Also proper co-ordination shall be between HVAC, ELE and ELV equipments and items for efficient functioning.

**Makes of Material:**

S.NO.	DESCRIPTION	MAKE
1.	Air Washer Unit	ARCTIC / Breezair / Symphony / Zeco / Greencon
2.	GSS Sheet	Tata / Sail / Essar / Jindal
3.	Duct Support	Hilti / Kanwal
4.	Grills, Diffusers, Fire Dampers, Louvers, Volume Control Dampers	Air Master / Titus / Precise
5.	MCCB	SCHNEIDER/ ABB / LEGRAND/ SIEMENS
6.	AL.AR. XLPE / PVC CABLES	HAVELLS / POLYCAB / FINOLEX
7.	M.C.B. / E.L.C.B. / D.B.'S/MCB PLUG AND SOCKET BOX	LEGRAND) / L & T / MERLIN GERIN/SCHIENDER/SEIMENCE
8.	PVC PIPE	KASTA/KISSAN/SUPREME/PRINCE
9.	GI / MS PIPE ( CLASS B)	PRAKASH/SURYA

**NOTE:**

- All the materials to be ISI marked.
- The materials shall be only of the approved makes as specified in this.
- The contractor shall submit samples of all the makes as specified in this list and the consultant / owner shall have the power to select any of them.
- Consultant / owner decision in this regard shall be binding on the contractor.
- In case any material is not available for any one or all of these approved makes the consultant / owner shall select and approve alternative make(s).

**IT Works (ELV):**

Design, Supply, Installation, termination, labeling, testing and commissioning of complete IT & Telephone system for building will be under the contractor scope. Work shall be done as per international safety codes and standards. Work shall include at-least CAT6 cables, conduits for cable, patch panel, patch cord, RJ45, face plate, surface mounted box (for wifi), network rack, 20 years performance guarantee from end to end from OEM. Approx. 15 LAN &Wifi points will be required in building. Only Wifi device will be supplied by institute for installation. For Telephone points – institute uses RJ45 and CAT 6 cable and minimum 6 points shall be provided.

**Door access & CCTV:**Supply & installation of Points (sockets), conduits and cables shall be in scope of contractor. The facility shall be provided near to all the doors of building (except bathroom doors) with 6Amp power switch-socket. All wires, cable and sockets needed for system will be in contractor scope.

**Specifications for IT works –**

**CAT6 UTP CABLE (INDOOR)**

Specifications

Conductor: .....23 AW copper

Insulation:.....

Polyethylene / LSZH

Jacket: .....PVC

Outside diameter .....4.5 - 6.0mm

Complies with:

ISO11801

TIA/EIA 568-B.2

IEC332-3

Mechanical Characteristics:

Minimum bending radius:

- During installation: ..... 50mm

- After installation: ..... 25mm

Maximum pulling tension:.....108N(11kg)

Thermal Characteristics:

Operation: ..... -15°C to 70°C

Installation: .....5°C to 40°C

Electrical Characteristics:

Conductor DC resistance @ 20°C (max): .....9.38U/100m

DC resistance unbalance (max):..... 5%

Mutual capacitance @ 20°C (max):.....5.6nF/100m

**CAT6 PATCH PANEL**

Specifications

Operating Temperature Range: .....-40o to 70oC (-40o to 158 oF)

RJ Socket, 8 Positions, General Specification: ..... FCC Part 68.500 (IEC 60603-7)  
 Transmission Performance and Reliability:  $\geq$  EIA/TIA 568-B.2-1 Category 6 /  $\geq$  ISO 11801 Class E Standard  
 Number of Plug Insertion Cycles:..... $\geq$ 750  
 Wire Diameter Range for Solid and .....22-26 AWG  
 Stranded Copper Conductors:.....0.40 mm to 0.65mm (0.016" to 0.025")  
 Wire Insulation Diameter Range (PE,PVC): .....0.70 mm to 1.70mm (0.028" to 0.067")

Contact Resistance: .....  $\leq$  1 mUtypical  
 Contact Re-terminations: .....  $\geq$  200  
 Insulation Resistance at 40 oC (104 oF) and 93% RH:..... $\geq$  500 MU  
 Safety Rating: ..... UL 1863

**CAT6 INFORMATION OUTLET**(These I/O's should be compatible with electrical vendor Faceplates being installed at site) (Prior testing / installation needs to be checked at site)

Specifications

Operating Temperature Range:..... -40o to 70 oC (-40o to 158 oF)  
 RJ Socket, 8 Positions, General Specification: .....FCC Part 68.500 (IEC60603-7)  
 Transmission Performance and Reliability:..... $\geq$  EIA/TIA 568-B.2-1 Category 6/.. $\geq$  ISO 11801 Class E Standard  
 Number of Plug Insertion Cycles:..... $\geq$  750 (IEC/EN60603-7)  
 Wire Diameter Range for Solid and Stranded Copper Conductors.....22-23 AWG  
 Wire Insulation Diameter Range (PE, PVC): .....1.04 mm to 1.60 mm (0.041" to 0.063")  
 Contact Resistance:..... $\leq$  1 mUtypical  
 Contact Re-terminations: ..... $\geq$  200  
 Insulation Resistance at 40 oC (104 oF) and 93% RH:..... $\geq$  500 MU (IEC 512-2-3a)  
 Safety Rating:..... UL 1863  
 Flammability Rating:.....UL 94 V-0

**CAT6 PATCH CORDS**

Specifications

Mechanical

Environment for use .....Indoors,  
 in dry closed rooms

Conductor ..... Copper,23 AWG, 7/0.195

Insulation .....Polyolefin, 0.96 +0.05mm diameter

Separator Material ..... PE

Jacket .....PVC

Outside Diameter .....5.4+  
 0.15mm

Minimum Bending Radius ..... 75mm

Maximum Pulling Tension ..... 18 kg

Max. Transport and Storage Temperature ..... 75°C

Operating Temperature Range .....-10°C to +75°C

Max. Relative Humidity ..... $\leq$  93%  
 non-condensing

Electrical

Conductor DC Resistance @ 20°C (max.).....93.8ohms/km

DC Resistance Unbalance (max.) ..... 5%

Mutual Capacitance @ 20°C (max.).....5.6nF/100m

Operating Voltage (max.): .....30V

Worst Case Cable Skew.....45ns/100m

Insulation Resistance .....100Mohm at 500VDC

Chemical Resistance to .....Oil, fuel, acid, bleach, organic solvents,  
 as per UL 444

## **NETWORK RACKS (RITTAL / VALRACK / NETRACK)**

### **15U (W 600mm/ D 600mm) Wall mountable Rack**

with front glass door. (FOR DC-2 AT GF, FF, SF& FOR DC-1 AT FF & SF) ONE ALSO FOR SV22

Accessories of rack

Fan Housing Unit with 4 fans

Cable manager 1U Horizontal x 4

AC main Channel 06 points 5 Amp (PDU)

Mounting Hardware (Pack of 10)

### **24U (W 600mm / D 800mm) Close rack 19" Floor**

mount : (For LV Room)

Front Door S12C 19" / 24U

Rear Door S12C 19" / 24U

Side Panels S12C 24U / 800mmD

AC Mains Channel (10 Points of 5/15 AMP sockets - (Vertical)

AC Distribution Box + H/W (5 Points of 5/15 AMP sockets -

(Horizontal)

19" 1U Cable Manager PVC with duct fingers x 5

Fan housing unit 4 Fan POSN

Fans 90 CFM 230 VAC

Castor Set Normal/ Brake

Bar, Earthing 24U

Mounting Hardware (Pack of 10) x 5

## **GENERAL CABLE LAYING PROCEDURE**

- Cat6 UTP cables will be ferruled at each end with predetermined ferruling. Alternatively Panduit labels may be used with proper printing and fixing.
- Information outlets should be labeled with predetermined markings using the labels and plastic shields packaged with the I/Os. There should be no handwritten identification on any I/O face plate.
- Each port of the 24 port patch panels should be identified predetermined markings using the labels and plastic shields packaged with the patch panels. There should be no handwritten identification on any port of the patch panel.
- While laying the Copper Cables (CAT6), separation rules have to be followed. Maintain at-least 300mm of gap between the data & power cables.
- If crossing each other, they should be at Right angles. These cables have to be properly tagged & labeled at every 2m. (Stenciled). The Raceways & Cable tray, need to be painted (in a unique colour, preferably orange) for identifications/ Maintenance purposes.
- TIA/EIA-569/609 standards have to be followed, while cable laying, considering the conduit fill in ratio, No. of bends, bending radius.
- Should follow TIE/EIA 568 while terminating the cable. Proper color coding for I/O identification, has to be followed for field termination. The patch panels & patch cords are supposed to be color coded/Tagged/identified with stickers. Blue for data, Yellow for Voice, Red for IP Surveillance, Green for IPTV & Violet for Wi-Fi (Stickers on patch panels).
- All cable trays / raceways / OS2 Fiber cable to be labeled & marked at every 2m. The fiber cable will be identified as "OFC DATA Cable #" using tags that are firmly secured on the cable. The # is the cable identifier which may be only a number. No paper prints or adhesive tapes are allowed. The tags will be plastic or aluminum embossed with the letters and tied with cable ties. Detailing the source & destination after every 4m (Specifically in the LV Shafts opening on the floors).

All the passive components should be of any one chosen brand, for certification purpose. (The OEM shall provide performance certification of 20-25 years, depending on the brand selected). This is required for ISO 14000 standard.

## **ACCEPTANCE TESTING**

It's essential to have a certified test report from the OEM, with regard to the testing of Fiber in this FTTx Environment. The testing should happen on all the three wavelengths of 1550, 1490 & 1310nm, for loss Budget & performance. Equipment's used, should be OTDR's, Point to Point power meters & Power

source, Visual fault Locators, Optical loss test sets (OLTs), to be very specific. Penta-scanning test to be conducted on all Copper components.

**Makes of Material:**

Sr. No.	MATERIAL	MAKES
1	Rigid PVC Conduit & Accessories for conduit	Precision, Polycab, Modi,
2	Flexible Wires – Cu – FRLS	Finolex, RR kable, Havells
3	Switches / Back box / Plates	Legrand (Arteor), MK (Blenze), Schneider (Zencelo)
4	DB / MCBs / ELCB /Ind plug socket	Schneider Acti 9, Legrand – DX <sup>3</sup> , Siemens, L & T
5	Power Cables	Finolex, Havells, Polycab, KEI
6	Fire Survival Cable	As above + Tyco, Bonton, Leone
7	Cable Glands	Double / Double Compression type – comet, Standard Metal Industries /HMI / polycab /
8	Cable Lugs	Dowells, 3-D / polycab
9	Connectors	Connectwell, Elmex.
10	M.S. Conduit – ISI marked	BEC, Steel Craft, Vimco
11	Ceiling Fans	Crompton / ORIENT /havell's / Bajaj
12	Exhaust Fan	Indoor – Usha Lexus or equiv. of Crompton / orient / havell / Bajaj
13	Cable Tray – Perforated 14 G hot dip GI	Profab, Indana, Legrand, OBO
14	Lighting fitting	Philips/ Crompton /Havell's / Wipro / Bajaj
15	ESE arrester /	INGECISO, Indelec, MAP, LPI, ERICO, SATTELITE-3
16	GI / AL Floor raceways and floor junction boxes	MK, Legrand
17	PVC wall raceway	MK, Legrand
18	Street light pole / area lighting / Bollard	Bajaj, K Lite
19	Maintenance Free Earthing	Universal/Galaxy/Ashlok/Indelec/JK
20	PIR SENSOR/ TIME SWITCH	Legrand/ Schneider / Philips
	Fire alarm	Notifier (Honeywell), Ceasefire, Jhonson Control
	Electronic Digital Meter	SCHNEIDER / SIEMENS / L&T /
21	Network RACK & ACCESSORIES	Netrack, valrack, Schneider
22	Cat 6 E /FIBER cable, CAT 6 I/O with face plate, Patch Panel and associated components	Systemax, Tyco, Legrand
23	All other materials	Make and sample to be approved by Engineer in charge before use in work

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## PRICE BID

### INDIAN INSTITUTE OF TECHNOLOGY INDORE

**Name of Work:-** “Construction of Multipurpose Hall (PRE-ENGINEERED/PREFABRICATED/COMPOSITE BUILDING)” on Design & Build Basis at IIT Indore, Simrol Campus

A) LUMP SUM PRICE:

Sr. No	Description of work	Amount in Rs	Remarks
1	“Construction of Multipurpose Hall (PRE-ENGINEERED / PREFABRICATED / COMPOSITE BUILDING)” on Design & Build Basis at IIT Indore, Simrol Campus as per specifications on Lump sum basis		

Amount (in words):

B) PROFORMA BILL OF QUANTITIES FOR INTERNAL SERVICES:

Sr. No.	ITEMS DESCRIPTION	Unit	Quantity	Rate (Rs)	Amount (Rs)	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
Total Amount (Rs.)						

Note -

1. In the above format, the items refer to the items that shall constitute the bill of quantities required for the project.
2. Service Tax (if applicable) will be reimbursed on proof of payment.
3. All taxes like TDS, labour cess, WCT etc. will be deducted at source from each bill as per prevailing Govt. rule/rates.
4. Security deposit will be deducted at source from each bill.

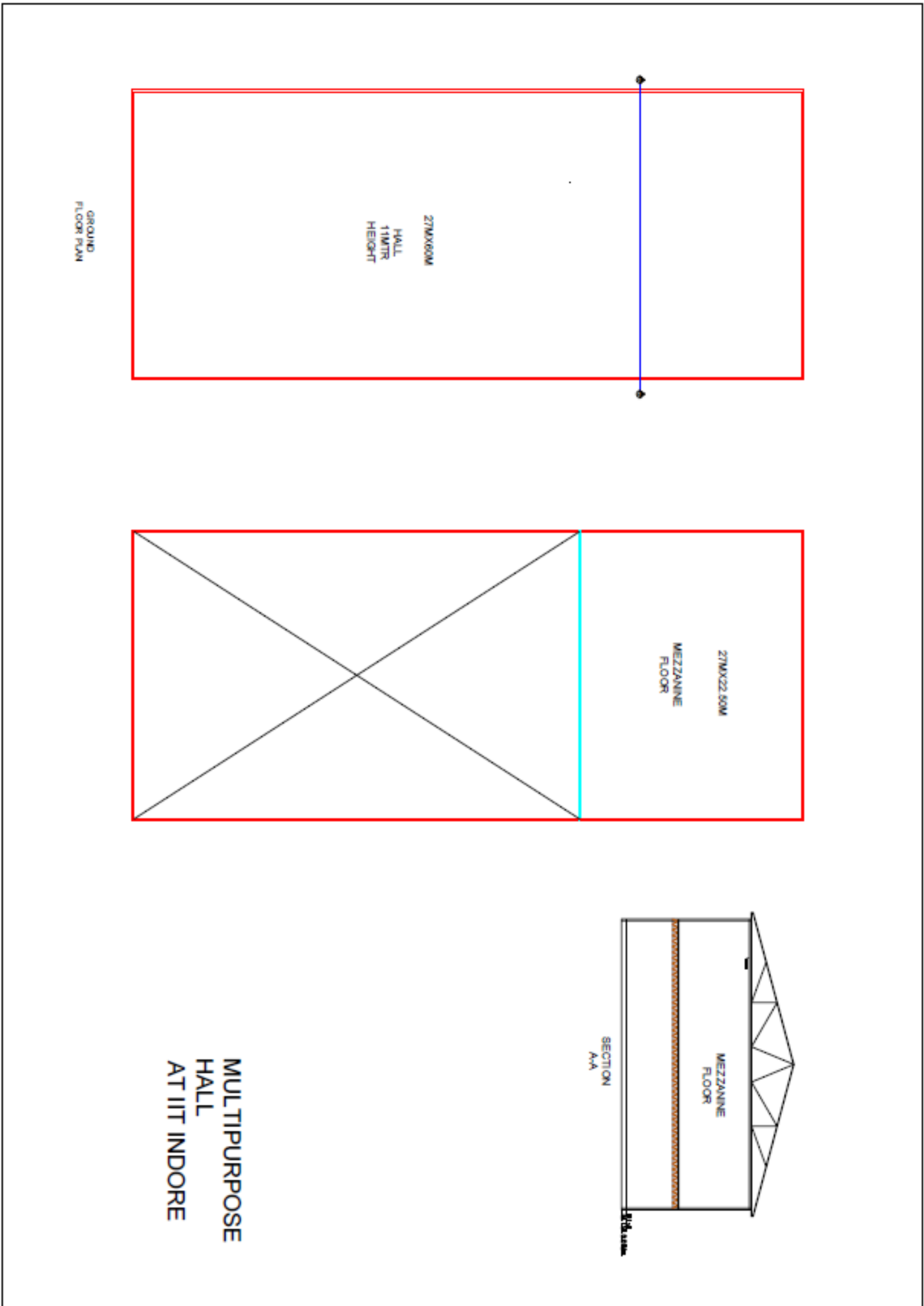
Signature with Seal of Firm

## PAYMENT SCHEDULE

Sl. No.	Stage of construction	Payment in % of Project cost
1	On completion of work up to plinth level including filling foundation, plinth beams etc. and under floor with base concrete complete and floor slab with reinforcement.	20%
2	On Supply and erecting of finished material at site required for prefabricated construction	50%
3	On completion of floors, Dado, Finishing and on completion of water supply and sanitary fittings, electrification and site clearance etc. in all respect and good for handover to the department.	20%
4	Handing Over the site as per satisfaction of Engineer in Charge/ user	10%

Note: - All such intermediate payment to the contractor shall be regarded as payment by way of advance against the final payment and security deposit will be deducted as per provision of tender document.

# Schematic Drawing for Reference



**MULTIPURPOSE  
HALL  
AT IIT INDORE**